

**MINISTRY OF ENVIRONMENT OF THE CZECH REPUBLIC
MENDEL AGRICULTURE AND FORESTRY UNIVERSITY BRNO
UNIVERSITY OF PARDUBICE**

**PROCEEDINGS FROM
INTERNATIONAL REGIONAL WORKSHOP ON
ENVIRONMENTAL BUSINESS ACCOUNTING
(CZECH REPUBLIC, SLOVAKIA, POLAND AND
HUNGARY)**

Brno, October 29 - 31, 2001

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PRACTICAL EXPERIENCE WITH INTRODUCING ENVIRONMENTAL ACCOUNTING IN CONDITIONS OF AN INDUSTRIAL ENTERPRISE

Leo Beran

The experience made with environmental accounting in our country is in general bad. By this we mean that the top management of a company usually has no idea what environmental accounting means or what it is good for.

Theoretically, we have to face another difficulty. Environmental accounting has been defined only as a principle so far, instead of its detailed describing, as was the case of financial accounting which was clearly defined and described in regulations and laws.

On the other hand, this situation gives us unprecedented possibilities of establishing systems adjusted to specific conditions of a particular enterprise and its activities.

As well as any other technical activity, research in the economic-environmental area is subordinated to one objective – the output, the product. The objectives (outputs) of environmental accounting, however, may be different, which means that the enterprise may have different priorities. One output will focus on return of investments, another on risks or impacts on revenues etc.

As a result of this, we may say that a complex approach is the best one, an output which can answer as many questions asked by the company's management as possible.

The company Transgas a.s. deals mainly with transport and storage of natural gas. This is ensured by a system of six compression plants, six underground tanks and six pipeline systems. All these units influence in a specific way our environment – they use and discharge water, produce waste, emissions, influence the countryside and the stability of connected ecosystems. The pipelines intersect biocorridors of different levels.

There are many instruments for minimizing the extent of pollution of these sources. However, if we should proceed systematically, it is necessary to identify all pollution aspects first, to assign the particular activities to them and, if possible, to quantify them.

Quantifying the impact of an activity on the environment may be quite a difficult task. First of all, physical units of measurement are used of course – tons per year, cubic metres per second etc. These units may be then converted into money. Does this conversion reflect reality? If we consider a shorter period, then yes – and I was lucky to be able to quantify the aspect more or less exactly in physical units of measurement. However, if we consider unquantifiable impact (using standard methods) or a longer term, the situation will be more complicated. The conversion of physical units into money is namely based on the fact that the prices are either market prices or are calculated according to a fiscal measure of the state. It is not necessary to emphasize how quickly market prices change and how quickly or, to be more precise, slowly the rates given by the state change.

After identifying the aspects, assigning them to particular activities and quantifying them, it is possible to evaluate their importance further. There are several possibilities – one of them is to create a huge table of criteria based for example on limits stipulated by binding legal regulations or technical standards and to find the importance of the given criterion by

assessing (by giving the percentage for example) how much reality differs from the criterion. Another possibility is to use subjective evaluation based for example on fuzzy logic. The advantage of this method is that, to a certain extent, it is also possible to record synergic effects or to assess the impact of local conditions influencing certain area.

Therefore we should be very sceptical about environmental assessment in financial units and we should know that prognoses are biased with a big mistake. However, if we know about this mistake and can interpret it correctly, the disadvantage changes into an advantage.

In practice, the first thing we need to do in order to implement our plan is to ensure high-quality monitoring of tangible flows, inputs and outputs first of all. Like finances, these are limited by virtual borders of the enterprise¹. We imagine the enterprise as a “black box” and in this phase, we are not interested in what happens inside. This principle refers to all media of the environment, where it is necessary to create a compact information system, or in case of already established IS an environmental information subsystem. Another phase is to monitor the internal flows (materials, energy, media etc) to a still comprehensible level. Only after creating the “virtual model of the enterprise” we may start interpreting it and analysing² it. At this point, I have to make one remark: It became very fashionable to ask foreign consulting companies to make an audit and to make the enterprise more effective. However, the only advantage of a foreign “expert” is, in my opinion, that such company does not suffer from the “operational blindness”³ or sentimentalism caused by a long-term employment in a particular enterprise. Consulting companies are very often strictly limited by the wording of the order (and also by the person - suffering from the operational blindness - who orders the service). By the statements mentioned above, I do not want to doubt the importance of consulting companies, for it is clear that an unbiased opinion is always important.

Now, we got to the position of the state. Imagine an example: a consulting company submits a really sophisticated project. (Sometimes the enterprises ask several consulting companies to make a project and the management may then decide which solution is the most “sophisticated”.)

Unfortunately – and here again the thesis of the operational blindness within the state is apparent – the management almost always chooses the project which is very similar to the current state of the enterprise, because, after all, the enterprise is established and is halfway functioning.

But let us go back to the accounting system. By identifying and quantifying the flows of materials, energies etc. and by developing a model of an enterprise we create background for its interpretation and analysis. We know for example about the waste production and the places where the waste production is at its highest. We also know how expensive the waste disposal is. It is also clear which activity produces the waste. We can use the model of the enterprise to determine whether it is economically favourable to limit or stop this activity, or whether it should be modified. We may also change the system of collecting waste or the way it is disposed (to change the company). It is important that all these technically possible measures or possibilities of further development are examined in terms of the expenses and economic impact. The result will be a complex outline of possibilities of solving problems out of which the optimum possibility may be chosen.

¹ A virtual border of the enterprise may be for example a bank account

² A mathematical model would be the best one, but it is also possible to use a diagram in less complicated cases – e.g. Sankey diagrams etc.

³ not only within an enterprise, but also in a larger environment like a state (stereotypes etc.)

It is interesting to see how the so called unimposed fines could be calculated in the revenues, for example to assess the return of an investment before its implementation. It is possible – if you collect enough examples in an illicit way (the state administration publishes statistics of fines, however without details of the particular cases) – to create following statistical model: when exceeding a certain limit by so and so much, the fine will probably move between a certain bottom and top level. However, it is necessary to calculate here also the so called “human coefficient” based, for example, on bad family background of a particular inspector of the Czech Environmental Inspectorate, or – on the other hand – his or her good mood on that particular day. In this way we finally get a result which is not well founded but accurate. The second possibility is to use a “scientific” method of postulating that the probable level of the unimposed fine is in direct (or more complicated) proportion to the level of exceeding the given limit or quantified criterion. In this case we get a well-founded (five pages of calculations) but inaccurate result.

For this reason I think science should be crucial in the state administration as well and fines should be assessable in advance, for example using a formula. And I emphasize the word “assessable”, they cannot be fixed, since an element of uncertainty should exist here for sinners. I say this mainly for the reason that an unimposed fine of more or less accurately defined level is one of the important criteria – inputs of the environmental accounting.

How it works in Transgas:

The information system in Transgas is now based on networks WAN and LAN. The individual units use LAN networks which are connected to the WAN network. Gradually, the system is replaced by a system with a central database. The communication speed has increased several times thanks to light-conductive cables and it is therefore possible to get connected directly to the database server from actually anywhere.

The generated waste is monitored in all operating units by a system of consistent sorting introduced in 1992. In every area in the enterprise there is an employee, who is responsible for waste disposal on this area and for the collection containers. After reaching a certain level – i.e. amount of waste – the container has to be taken to a collecting point. The collecting point is closed and contains special containers for all kinds of produced waste. The collecting point is managed by an expert – the enterprise ecologist - who is responsible for registering the amounts and types of waste supplied from above mentioned areas and who is present at the collecting point during “working hours”. He or she is also responsible for further processing of the waste and after the containers were filled up to a certain level for transporting it to other companies which have signed contract with our enterprise. He or she also prints all required documents – waybills etc. The waste is systematically sorted and registered in all units of the enterprise as well as at the directorate.

With regard to the Act on air pollution, compression plants are large air pollution sources and lie in the category of sources which require a continuous measuring of emissions. Therefore, on each gas turbine there is a measuring device – an emission monitoring system – which continuously transfers data to the management center of the compression plant, to the enterprise ecologist, to the control unit of Transgas and to the main ecologist of the enterprise. Information on the ground-level concentrations (immission concentrations) - dispersion situation for large pollution sources is available in form of reports for the public. They inform on expected ground-level concentrations (and ground-level concentrations caused by Transgas) in the nearby countryside and towns.

Small and medium sources have to register usually once a week. All sources are measured in regular intervals by authorized companies and the results of these measurements are used for statistical assessments for Transgas. Although the legislative does not require measuring concentrations from small sources, Transgas carries out measurements of small sources up to the level of a power saw, shrub saw and other devices like electrocentres. etc. Each of these devices must be checked at least once during its working life – it is important because the worker works the whole day with such device and has to breathe the gas – even when it is diluted.

As far as water management is concerned, we measure water which we get from the suppliers (water supply company, municipality authority...), the surface water and the groundwater. Now we are in process of replacing the water-meters with electronic water-meters which enable a continuous data transfer to the computer network. We also measure water which is discharged – using Parshall drains with electronic assessment system and transferring the data into the network.

The nature protection has been neglected a little, I have to admit – but only as far as technical devices for its monitoring are concerned. All new projects involve the environmental impact assessment, whether it is required by law or not. If we are forced to build a gas pipe through an environmentally exposed area, we naturally finance – together with professional organizations – the transport of protected plants and animals. A project for a geographical information subsystem is being developed now and this system should focus on ecological commodities (hydrogeology, groundwater protection, ecosystems, biocorridors etc.). Apart from this, all land estates owned by Transgas are monitored regularly by phytopatologists in order to find out possible phytoparasites or zooparasites, diseases, mildews and fungi.

Transgas a.s. (former state-owned company) was audited several times by external companies, a technical-ecological audit was carried out in all units of this enterprise (Ekosystém Praha, Plynoprojekt Praha) and it involved examination of old contaminated sites, water management, waste disposal and all other parts of the environment. Furthermore, system audits were carried out – since May 2000 the enterprise has been certified according to the standard ČSN EN ISO 14001 by RW TÜV. We are also glad that the company DHV CR made the so called European eco-audit for us at the beginning of this year. This audit monitored the harmonization of our enterprise with the European legislation.

All parts of the environment mentioned above (I have not mentioned the register of chemical substances, energy management, accident planning, noise prevention, heat energy and so on) are registered in required intervals in physical units of measurement as well as financial units. This extensive database is the basis for the actual assessment and evaluating. We test, for example, whether it is of our economic interest to reconstruct our water management in the way which would enable us to use precipitation water for social purposes, to recycle water used for washing cars etc.

We have not reached a more abstract level so far and have not introduced for example analytical environmental accounts yet. To be more precise, almost all environmental expenses are traceable – thanks to their dividing by means of software register systems described above or thanks to the fact that they are included with a certain label into our central economic database. However, we do not work with them on the level of accounting evaluation. Neither the extramarket evaluation has been used, mainly because there are actually no investments into the countryside or historic landmarks etc., or to be more accurate, part of the expenses for maintaining the landscape character is required by an authority of the state administration within a building or other permit procedure.

Allow me to summarize now what I have outlined in this article: the basic precondition for every type of accounting, including the environmental accounting, is consistent monitoring of tangible as well as information flows. Moreover, this activity must find at least a small place in the management system of the enterprise with as strong competencies and responsibility as possible. And the most significant thing is to try to find out “how it actually works”.

Thank you for your attention.

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TRANSPOSITION AND IMPLEMENTATION OF THE COUNCIL DIRECTIVE 96/61/EC ON IPPC

Marta Běťáková

Contribution layout:

1. Summary of issues on IPPC.
2. The Government bill on integrated pollution prevention and integrated register of pollution sources and amending some related acts (the bill on integrated pollution prevention).
3. Institutional backup to the act on integrated pollution prevention.
4. Benefits of the novel approach.

The classic approach to environmental protection (the control and management strategy represented by so called end-of pipe technologies, for example) focused on the protection of respective environmental compartments (air, water, soil, etc.) has been recently transformed into a novel approach understanding the environmental protection at a broader context. This approach accentuates the following:

- gradual incorporating of environmental aspects into every activity (ministries policies), and
- integrated approach to the environmental protection, i.e. protection of all the environmental compartments as a whole.

The novel approach is reflected into the new legislative framework of the EU set out namely by means of the **Council Directive 96/61/EC, on integrated pollution prevention and control** (so called the Directive on IPPC). This Directive is superseding the previous directives, which relate to the control of pollutants emissions from enterprises into water, air, and soil, and to waste control. At the same time the Directive cover noise and vibration control.

Major aspects of integrated pollution prevention and control may be summarised as follows:

- System of the integrated pollution prevention means, except others, a method of regulation, which applies integrated approach to permitting of environmental impacts of selected activities (because different approaches to emission reduction into air, water or soil may rather support the transfer of pollution in between these respective compartments than to protect the environment as a whole, and the highest possible level of protection of the environment as a whole may be achieved only if procedures of competent authorities for the permit issuance and conditions they establish for the permit being issued shall be co-ordinated in full);
- The regime of IPPC is obligatory to facilities defined in the Annex No. 1 of the Directive as well as the bill (these are namely large polluters of the following fields – energy industry, production and processing of metals, mineral processing,

chemical industry, waste management, and furthermore paper industry, textile industry, leather industry, and large breeding facilities of pigs and poultry);

- The system of integrated pollution prevention supports the application of the best available techniques (BAT) when establishing conditions for and at the operation of the facilities concerned itself;
- Under the IPPC regime appropriate facilities are regulated so that environmental protection is provided through single permit issuing process at single contact/permit issuing location;
- Individual approach to every facility within the permit issuing process according to IPPC takes into account specifics of every respective facility (technologies employed) and the enterprise itself including time and economic aspects (i.e. equipment age, innovation cycle, availability);
- Within the integrated permit issuing process the public concerned is provided with information through the publication of the application for and, furthermore, the public participation in the expressing opinions on the permit conditions by means of the potential to bring opinion on the condition proposed in the application and participation in the application proceedings;
- Within the IPPC regime there is continuous monitoring in accordance with the permit conditions, regular reviews of the permit conditions compliance, and return of land to its original state after activities subject to the permit are terminated;
- In order to provide for information exchange and monitoring of the development of best available techniques in respective Member States of the European Union and among appropriate industries the European Commission established dedicated institutes – Information Forum on IPPC and Technical Working Groups developing background summary information on BAT.

In relation to the Directive on IPPC the **principles, which characterise, to a certain extent, benefits of the novel approach**, have been often cited as follows:

- principle of integration;
- principle of prevention;
- principle of subsidiarity;
- principle of best available techniques;
- principle of dialog, negotiations, openness, and information exchange.

Process of the issuing of the integrated permit is based on the principles mentioned above and it shall result in the issuing of the integrated permit to the facility operation. In the process of the issuing of the integrated permit the **communication** and co-operation of the regulator, operator, professional institution (Agency), and the public are very **important**. The result is the permit issuing process is simplified - single permit, single location. The **individual approach** within the permit issuing process makes an important aspect, local conditions are always taken into account.

In the case of the Directive on IPPC the principle of subsidiarity is applied by means of the delegation of the decisive power to the lowest level possible. At the national level the

role of regions is reinforced, in the centre only such problems are treated, which cannot be addressed at the regional level (for example, issuing of permits for transboundary impact facilities). Simultaneously it is, of course, necessary to notice the importance of a certain **uniformity of the permit issuing** in order to provide equal conditions to respective enterprises concerned. The mentioned equal conditions has two aspects:

- *process uniformity* – all applicants should undergo the same procedures within the issuing of the integrated permit,
- *uniform outcomes* – similar enterprises of comparable economic conditions and environmental impacts should receive comparable permits.

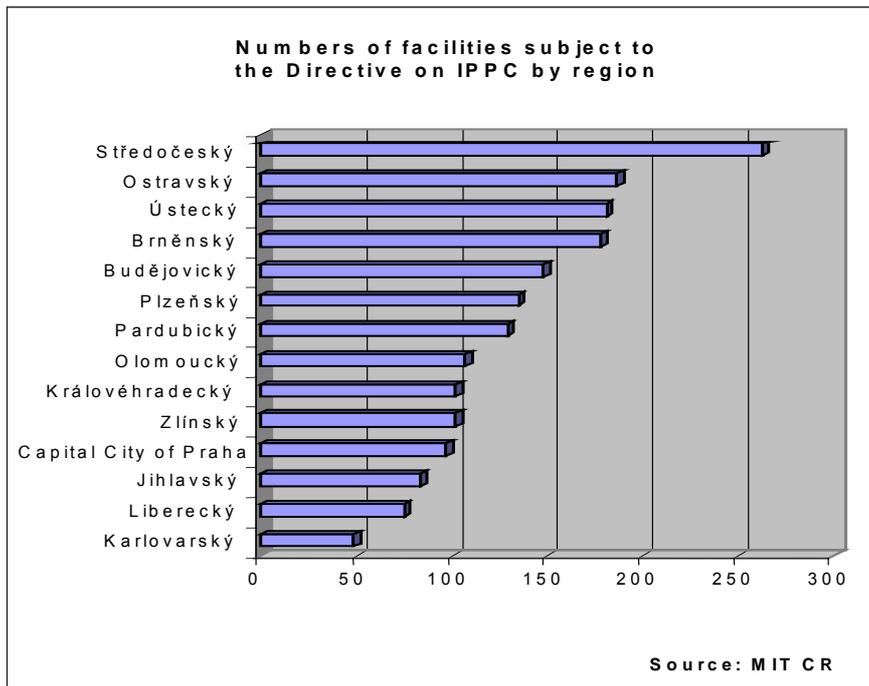
The directive on IPPC has been transposed into the Czech legislation by means of the **Government bill on the integrated pollution prevention and control, integrated register of pollution sources, and amending certain acts (the bill on integrated pollution prevention)**. When approved by the Government (June 6, 2001) the bill on integrated pollution prevention was handed over to the Deputy Chamber of the Parliament of the Czech Republic, where it passed the first reading (July 2001). The act is assumed to become effective since January 1, 2003 (except for certain provisions relating to institutional back-up). If the bill is passed the act shall affect almost 1,100 facilities of roughly 580 enterprises belonging to the industries mentioned¹.

Operators of such facilities shall be impelled to acquire the integrated permit for the facility operation **by October 30, 2007** or in case of newly established facilities the permit shall be the inevitable condition for the issuing of the construction permit. Because the Directive 96/61/EC on IPPC already became effective in October 1999 in the Member States of the European Union, it differentiates so called existing and new facilities by the decisive date of October 30, 1999. The proposed legislation reflects the Directive within limitations following from the negotiations of the Czech Republic on the accession to the European Union and the European Union pressure not to make the position of enterprises in the EU Member States more advantageous against the corresponding enterprises in so called Candidate States.

The regional authorities with delegated power shall fulfil the function of the regulator to majority of facilities. The graph bellow depicts the distribution of number of facilities by respective region.

¹ Source: Statistics of the database of enterprises subject to the IPPC, Data Source - CEU (www.ceu.cz/ippc).

Graph : Approximate distribution of facilities subject to the Directive on IPPC by respective regions of the Czech Republic (source - MIT CR).



In order to provide for uniformity in between respective regions and for the sake of providing experts for various types of regulated industries the bill proposes to establish purely **expert body** (Agency for Sustainable Development), which shall provide expert assistance to all parties to the proceedings. Our findings, confirmed by results of projects and foreign experience, revealed that the use of a different model is not suitable, because only an independent and government sponsored agency enables to reduce risk of corruption, misconception, and non-qualified decision making, and to prevent unbearably high costs for the expert service. Concerning consultants hired on ad-hoc basis the bill shall not limit their services and use by the enterprises, which might need their services and will be able to reimburse them from their own resources. At the same time the solution chosen was selected due to term of office of the regional authorities. Because the bill on integrated prevention introduces a novel approach to newly established authorities the proposer strove for making the initial troubles expected with the assessing of a vast professional issues easier by means of establishing the mentioned professional back-up. In order to support the solution selected the example of Great Britain may be given where the integrated permits for enterprises in different regions are issued by appropriate regional offices of the Environment Agency. British Environment Agency Environment has a central team co-ordinating the introduction of integrated permit issuing.

Reasons why this central authority was established were as follows:

- The need to achieve uniformity between regions.
- To use savings attained through the development of the centralised model for the IPPC implementation in various industries.
- Capability to arrange for experts (from different regions).

The setting of the permit issuing process and quality of the institutional back-up are decisive also for the determining of potential impacts on national economy. The development of a proposal for the improvement of environmental performance of the enterprise within the application for the integrated permit including the description of measures implemented and investments incurred shall lead to investments performed at higher quality and effectiveness, which were caused due to not mere necessity of the environmental protection, yet also the exchange of obsolete installations and equipment (for the reason of the industry and/or enterprise investment cycle), or the inevitable restructuring, and which could lead to savings of materials, energy, and waste and so to savings of operating costs of the production. Therefore to **major benefits** the following may be involved:

- co-ordinated complete approach to the assessment of the proposed investments for the implementation of preventive techniques and end-of-pipe technologies for the environmental protection shall bring savings of time and reduce the administrative load;
- savings of costs for raw materials, materials, and energy;
- profit increase achieved due to maintained and increased competitiveness, access to new and existing markets (the lack of integrated permit may be used by the current Member States of the EU as an import barrier);
- lower fees for environmental pollution and waste disposal;
- increase in the production capacity of the facility;
- positive acceleration to the inevitable innovation processes;
- higher quality of environmental amenities, products and services utilised in production processes;
- improvement of management and organisation procedures at enterprises (use of EMS, EMAS, the series of ISO standards, systems of energy management, cleaner production, waste minimisation, etc., which would be predecessors to the process of the issuing of the integrated permit);
- higher quality of decision making processes shall got reflected, besides others, in increased effectivity.

For the material development background documents were employed as follows:

Assessment of impacts (technical, economic, environmental and social) of the application of the Council Directive 96/61/EC on IPPC under the conditions of the Czech Republic to every ministry sector and a proposal for instruments supporting its implementation, developed by RNDr. Dana Chrtková, CSc., Department of strategies of MOE CR.

Providing for the IPPC implementation: Importance of the Great Britain experience to the Czech Republic, developed by Tim Young, consultant of the AEA Technology.

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ACT. NO. 353/1999 COLL. ON THE PREVENTION OF MAJOR ACCIDENTS

Karel Bláha

The legal base concerning the prevention of industrial accidents is established by the Act No. 353/1999 Coll., on the prevention of major accidents caused by selected dangerous chemical substances and chemical preparations and on amendment of Act No. 425/1990 Coll., on district authorities, outlining of their jurisdiction and some other related measures, in the wording of later regulations (Act on prevention of major accidents). The Act has been adopted in December, 1999 and entered into force on January 29, 2000.

The Act is equipped with three subsequent legal provision, as follows:

Government Regulation No. 6/2000 Coll., laying down the manner of evaluating the safety program for prevention of major accidents and the safety report, the content of the annual plan of controls, the procedure in carrying out the control, the content of information and the content of the final report on the control.

Decree of the Ministry of the Environment No. 7/2000 Coll., laying down the extent and manner of preparing notification of a major accident and the final report on the occurrence and consequences of a major accident.

Decree of the Ministry of the Environment No. 8/2000 Coll., laying down the principles of the evaluation of the risk of a major accident, the extent and manner of preparing the safety program for prevention of major accidents and the safety report, the preparation of the internal emergency plan, the preparation of documents for laying down zones of emergency planning and for preparing the external emergency plan and the extent and manner of information intended for the general public and the procedure in providing for informing of the general public in the zone of emergency planning

The Act lays down a system of prevention of major accidents for establishments and installations, in which is located a selected dangerous chemical substance or chemical preparation in an amount equal to or greater than the amount set forth in Annex No. 1 to this Act. Its basic concept is focused on the prevention of the occurrence of accidents, but the enforcement of it will significantly contribute to crisis management. In particular, the emergency planning - the extent and manner of preparing the safety program for prevention of major accidents and the safety report, the preparation of the internal emergency plan, the preparation of documents for laying down zones of emergency planning and for preparing the external emergency plan laid down in the Decree No. 8/2000 Coll., will play a key role.

General conditions for prevention of major accidents are laid down in § 3 of the Act. Every legal person and natural person who owns or uses or will own or use an establishment or installation, in which is or will be located a dangerous substance, shall be obliged to classify the establishment or installation in the pertinent group if the amount of dangerous substance located in the establishment or installation is equal to or greater than the amount set forth in column 1 of Table I or Table II set forth in Annex No. 1 to this Act. The date to fulfill this obligation has expired on July 29, 2001. Up to date, based on the reports submitted to and revised by the ministry, there are 164 operators listed, 93 of which in Group A and 71 in Group B. In all of these enterprises, the inspections are currently carried out, according to the

Inspection plan adopted for 2001. Controls are focused namely on the correctness of data on dangerous properties and quantities of dangerous substance given in reports and, consequently on the correctness of the classification of establishments or installations. Inspections are carried out by the Czech Environmental Inspection in collaboration with district authorities and with Occupational Safety Research Institute (OSRI). Their results are being evaluated.

The district authorities shall assess the potential for the occurrence of cumulative or synergetic effects following from the positions of the surrounding establishments or installations and from the kind and amount of dangerous substance located therein and on the basis of this assessment shall designate establishments and installations whose mutual position increases the risk of a major accident. The District Authority shall immediately notify this fact to the legal person or natural person who owns or uses the designated establishment or installation. Persons designated pursuant to § 5 shall be obliged to mutually cooperate in assessment of the risk of a major accident and in the preparation of a safety program for prevention of a major accident (hereinafter a "program"), safety report and emergency plan pursuant to this Act.

All operators are obliged to elaborate the appropriate emergency documents and submit them to the Ministry no later than by the end of January 2002. In order to facilitate this complex task and to help both operators and the state administration. The Ministry in collaboration with OCRI prepared, within a research project No VaV/340/3/00 entitled „ Analysis of a new approach to the implementation of environmental management systems“ a set of guidelines. These guidelines are being published in the Bulletin of the Ministry. In connection with oncoming changes in the state administration the obligations given to District authorities will shift to regions.

The Act. No. 353/1999 Coll., on the prevention of major accidents is fully harmonized with the EU legislation (Council Directive No. 96/82/EC – Seveso II) and with the recommendations of the OECD.. Czech Republic is a regular participant at meetings of the Committee of Competent authorities (CCA) of Member States. The principal task of these meetings, being held twice a year and coordinated by DG ENVI, is the evaluation of a current status of implementation of Seveso II Directive. We can conclude that, unlike in the Czech Republic, in some Member States the Directive was not transposed yet and these cases will be solved by the European Court.

The European Commission is preparing quite extensive amendments to the Seveso II Directive, initiated by several industrial accidents occurred in Europe last year (Baia Mare, Enschede). Proposed changes will be discussed at the next CCA meeting (Antwerp, October 2001). Ministry is being involved in this activity and, within its competencies, is preparing the necessary steps for further improvement of the effectiveness of the prevention system as a part of civil emergency planning. Within the framework of the proposal of the Act on chemical substances and preparations, which will be submitted to the government by the end of November, 2001, a so called „small novel of the Act No. 353/1999 Coll will take place in order to improve the connections between these two important legal provisions.

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STIMULATIVE FUNCTION OF ENVIRONMENTAL CHARGES

Miroslav Hájek

One of the basic functions of environmental charges is their stimulative function. The importance of such charges for financial analyses is often underestimated or included in environmental accounting, which leads to misinterpreting their significance for the economic system of an enterprise.

Definition of charges

Firstly, it is necessary to define the term “environmental charges”. We cannot generalize the definition on the international level, for there are several terms: taxes, fees, charges. However, these payments are defined precisely by law at national level. Therefore, the common database of the OECD and EU, for example, defines so called “environmentally related taxes, fees and charges” which comprise all payments related to environmental protection. A certain level of unification may be found in some Middle and Eastern European countries (Sourcebook on Economic Instruments for Environmental Policy), where the charge system is richer than, for instance, in the countries of the European Union (Environmental Taxes and Charges in the Single Market).

There is a range of terms used in the Czech Republic which may be characterized as environmental charges (poplatek, úhrada, odvod, úplata). However, there is going to be one term in the future – “poplatek”. New legislation has already used this term. For example, the term “úplaty” (payments in water management) were changed for “poplatky”. These charges are often confused with administration charges which are stipulated by a special act and are usually required for administrative acts of the state administration authorities. The charges may be also confused with local charges (a change for “local taxes” has been suggested, but refused by the Parliament) which are really more taxes than charges (in this area no environmental charges have been introduced yet).

Environmental charges may be thus defined as payments which are regulated by laws as payments for environmental protection, and are always specified – for example for a certain part of the environment. Therefore, the term “charges (poplatky)” cannot be used separately, but always with explanation (like charges for wastewater discharges into surface water, waste disposal charges...).

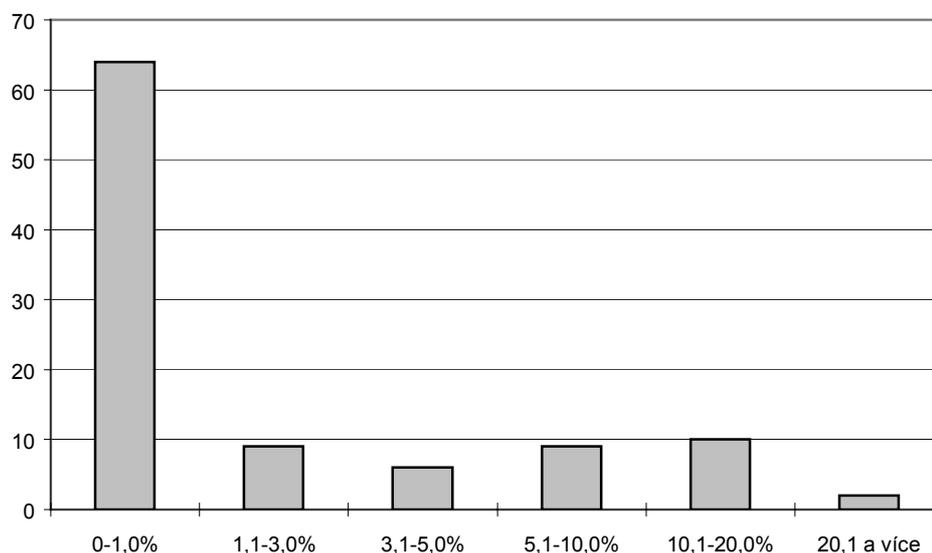
Statistical solutions

In connection with the gradual adoption of environmental legislation in the Czech Republic in the early 90s, a range of studies and statistical investigations dealing, apart from other aspects, with the impacts of environmental charges on the economic situation of enterprises were carried out. The result of these statistical investigations was that the charges do not represent a significant share of total expenses (up to 1 %) and revenues. For example, the indicator “share of charges on production consumption” is very low. In 92 % of the cases the charges fall in the span 0 –1,0 %. Some of the industry branches fall completely in this span, some other like the textile and clothing industry show different results: 74 % lie in the

span up to 1,0 %, 18 % in the span up to 3,0 % and 8 % in the span up to 5,0 %. The situation is similar in following branches: mining non-energy materials, wooden goods production, paper and polygraphic industry.

The monitoring of the relation between environmental charges and total investments (chart 1) was more conclusive. The stimulative effect of environmental charges to implement measures for pollution reduction is more apparent here. It is true that the majority of the cases (64 %) fall in the span between 0 and 1,0 %, however, there are big deflections in the individual branches - as far as electricity, gas and water production and distribution is concerned, the percentage is 92 %, while in carbonizing branch and refineries the percentage is only 3 %. There are also substantial differences in the individual spans. 40 % of companies in metal production and production of metal goods are in the 10,1 - 20,0 % span, 62 % of carbonizing companies and rafineries are in the 5,1 – 10,0 % span.

Chart 1 The share of environmental charges on total investments (in certain monitored companies) in %

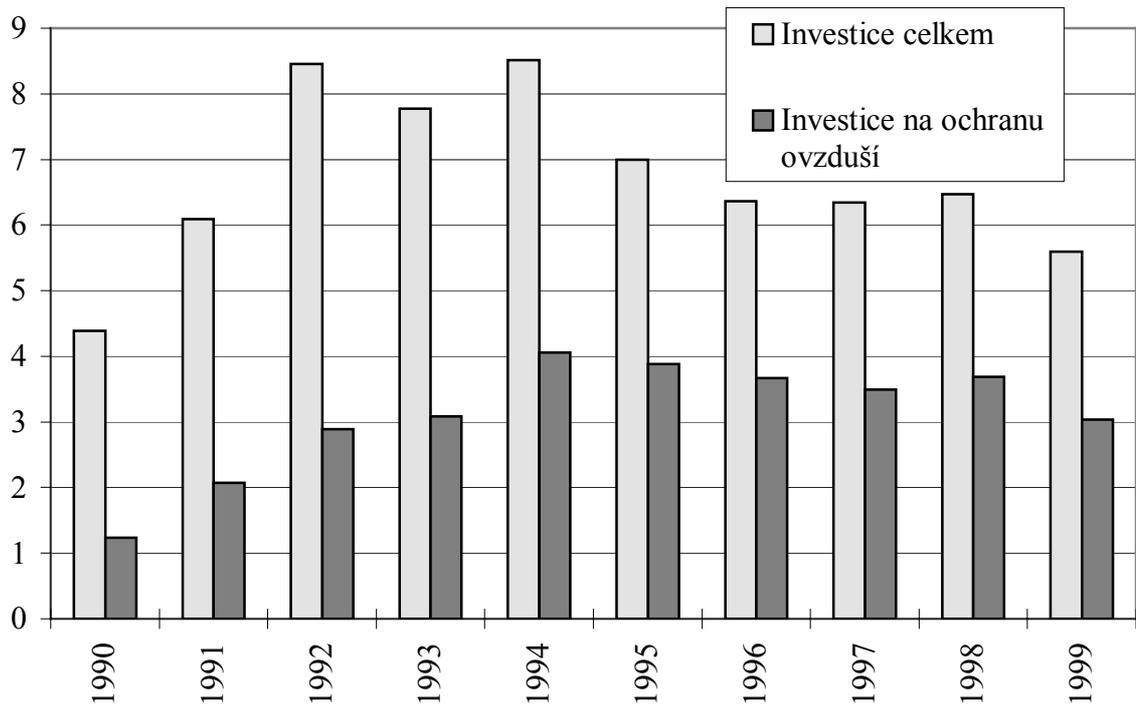


Source: The Czech Statistical Institute

The highest share of the environmental charges on investments is in the processing industry. The relation between the charges and total investments calculated in statistical investigations may be explained by the fact that, for example, the setting of charges for discharging waste water into surface water is based on real expenses for operating the relevant treatment plants (including depreciation). However, we have to admit that environmental investments are relatively expensive and create a substantial part in total investments (Chart 2). As far as investments are generally concerned, when deciding on the future of a company, the optimum share of production investments and environmental investments have to be considered.

It is apparent that the highest share of environmental investments was monitored in the years between 1992 and 1994 (7,8 – 8,5 %). Then, a decline of this indicator was obvious, and in the past few years this indicator has reached approximately 6,4 % (in 1999 only 5,6 %). The chart shows a different development of the share of investments for the air protection on total investments: until 1994 the annual growth was high (from 1,2 % in 1990 to 4,1 % in 1994), then a moderate decline may be observed.

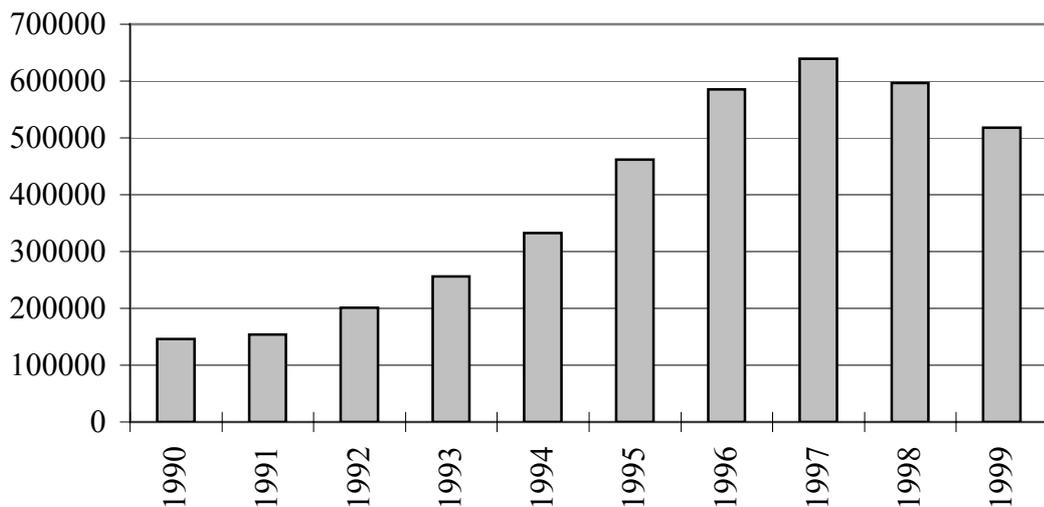
Chart 2 The share of environmental investments on total investments in %



Source: The Czech Statistical Institute

The indicator for the share of the environmental investments on total investments depends naturally on the development of total investments. This development in the Czech Republic was moderate at the beginning and later more substantial, which lead to a decline of the share indicator mentioned above (chart 3).

Chart 3 The development of gross tangible investments in the Czech Republic in million CZK



Source: The Czech Statistical Institute

A study on implementing environmental accounting and its impacts

Apart from the statistical investigations mentioned above, a range of studies was written on the impacts of the legislation related to the environmental protection on the enterprises. Let us take, as an example, a study of one joint-stock company in metallurgical production which introduced environmental accounting already in 1993. The introduced system was simplified in order to get as clear results as possible. The study is based on two solutions – so called end-of-pipe measures (technologies), and on restructuring the entire enterprise and buying new technologies. The company decided to choose the second solution.

The analysis deals with the effectiveness of input means after calculating environmental charges and environmental investments. The results show that the decisive impact on the economic development of the company was due to the environmental investments which would be 2,5 times higher in the first solution than in the second solution. It is apparent that environmental investments burden the economic situation of the company twice as much as charges, but regarding the limits provided by the law on air protection it is not possible to choose between investments and charges. If we compare the effectiveness indicator, it is apparent that its decline by approximately 35 % is expected as a consequence of adopting new legislation on environmental protection. The choice of the company proved to be the right one, even though the company had serious economic difficulties in the last few years. Finally it overcame the economic crisis.

Conclusion

As far as the stimulative function is concerned, it is clear that environmental charges must be an integral item in the methodology of environmental management accounting. If we want the charges to have a stimulative function, they must be included – in a suitable form - in the calculation of expenses and financial analyses. As for their impact on the economic development of an enterprise, they serve mainly for the internalization of external expenses arising as a consequence of using and polluting the environment, and that is why it is possible to consider them as expenses for the purpose of environmental accounting.

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INTERCONNECTING FINANCIAL AND ENVIRONMENTAL ACCOUNTING AND ITS RISKS FROM THE POINT OF VIEW OF A FINANCIAL AUDITOR

Jiří Hřebíček, Jana Soukopová

INTRODUCTION

In the past ten years, we have started to perceive environmental accounting as a top management instrument which enables monitoring of environmental aspects in the system of business management and as a suitable instrument for assessment of implementation of the environmental management system within the entire economic and financial management system (as a part of the information system of the enterprise [2]). There are many studies which deal with environmental accounting as a part of financial accounting and which show how to use financial accounting for getting information on environmental impacts. In this article which is linked to the previous article on environmental accounting (see [3]), we would like to describe some of the risks and advantages of interconnecting financial and environmental accounting from the point of view of an auditor. This issue is related to the amendment to the Act on auditors which has been effective since January 1, 2001, and which harmonizes our legislation regarding the position of auditors with the legislation and standards of the EU. Furthermore, this issue is related to the implementation of the national programme EMAS which is related to the amended European Parliament and Council Regulation (EC) No. 761/2001, on voluntary participation of organizations in the programme for implementing eco-management and eco-audit of the Community - which has used the methodology of ISO 14000 standards and replaced the EEC Council Regulation No. 1836/1993.

1. MONITORING ENVIRONMENTAL EXPENSES

According to our current legal regulations, enterprises in the Czech Republic are obliged to provide their environmental information to the state environmental administration (district authorities, Czech Environmental Inspection etc.) as well as to the Czech Statistical Institute. The term *environmental information* is described in detail in the Act No. 123/1998 on providing environmental information as written, graphic or audio information - on IT media or in another technical form – which is related mainly to:

- the condition and development of our environment, causes and consequences of this condition,
- activities which could lead to the improvement of our environment and measures which are going to be implemented by authorities responsible for environmental protection or other entities when preventing pollution or rectifying environmental damages,
- the condition of water, air, soil, living organisms and ecosystems, information on activities influencing the environment, on substances, noise and radiation emitted to the environment and on consequences of these emissions,
- using natural resources and its impact on the environment, and information necessary for the assessment of causes and consequences of such using on living organisms and our society,

- impacts of buildings, activities, technologies and products on the environment,
- administration procedures concerning the environment, environmental impact assessment, petitions and claims and their administration, information included in documents on particularly protected parts of nature and other parts of the environment protected in accordance with special regulations,
- economic and financial analyses used in decision-making processes related to the environment, provided they have been financed by public finances.

There is a range of laws and their implementing regulations which require that enterprises provide their environmental information to the state administration bodies (like registers concerning waste and water management, air protection, hazardous chemical substances and preparations, accident prevention as well as transport of hazardous substances and waste). Enterprises have to provide information to the Czech Statistical Institute, which is regulated in the Act No. 89/1995, on state statistical service, amended by the Act No. 220/2000, 256/2000 and the Act No. 411/2000, within a programme of annual statistical calculations which is specified every year (this year – Programme of Statistical Calculations for the Year 2000, published in the Collection of Laws of the Czech Republic - November 6, 2000).

Enterprises may provide environmental information regarding environmental risks, environmental impacts, rules, strategies, tasks, expenses, debts or environmental profile in following forms:

1. **annual report or financial statement**
2. **environmental statement** (within EMAS)
3. **report on the enterprise environmental profile** (within the standard ČSN EN ISO 14031)
4. **other information media** (like information sheet for the employees, video cassettes, CD ROMs and Internet or Intranet).

However, in all other cases than in the first point, the risk concerning the credibility of provided information is higher (in terms of their measurability).

One of the possible ways of at least partial measurement of the influence of top management on the environment (see for instance management indicators in environmental profile [1]) is to measure it using accounting or financial data. The most common way is to use accounting data from the profit and loss statement in the framework of the accounting analytical register of expenses. In analytical accounts¹ environmental expenses may be differentiated.

The most common classification of accounting classes:

- **50 – Consumed purchases** – especially the differentiation of expenses for input consumption
- **53 – Taxes and charges** – mainly charges, fines and payments for pollution (wastewater discharges, waste disposal in landfills, emissions...)

¹ For example, in the account 501 – *Material consumption* following differentiation is possible: 501001 – New material consumption 501002 – Reused material consumption (from waste) and 501003 – Recycled material consumption.

- **54 – Other operating expenses** – operating expenses of devices for environmental protection (expenses for environmental accident prevention, for operating own environmental devices, for operating sewage treatment plants, catchpits, septic tanks, cesspits, cleaning plants etc.)
- **55 – Depreciation, reserves and adjustments to operating expenses** – risk assessment (creation of reserves)
- **58 – Extraordinary expenses** – sanitation expenses for accidents, catastrophes etc.

The current legislation of the Czech Republic does not include any classification of environmental expenses, however, the Czech Statistical Institute made some investigation in monitoring expenses for water and waste management (drinking water, water levy, sewage levy, charges for releases and waste disposal). On the other hand, there is a range of studies [4] with wide differentiation of environmental expenses (see Collection of papers from Workshop on Business Environmental Accounting held in October 2000 at the University in Pardubice).

These expenses may be monitored through analytical registers in financial accounting which enables selecting that part of environmental financial accounting from traditional financial accounting which enables us to find out information on certain management indicators in the environmental profile and consequently environmental expenses.

In financial accounting, it is possible to monitor some other information relating to management indicators in the environmental profile – in the balance sheets and balance accounts like:

- reserves and adjustments for environmental damages which caused the devaluation of property (like contaminated sites), they may be monitored also through analytical accounts,
- environmental investments on analytical fixed assets accounts,
- to monitor storage of risk substances which may lead to pollution and damages of the environment, or which belong among hazardous chemical substances or preparations or hazardous waste
- to monitor information on consumers and suppliers which have established environmental management system and prefer “environmentally friendly” products and services etc. (on analytical accounts of receivables and payables).

As the paragraphs above show, interconnecting financial and environmental accounting for monitoring of certain indicators of environmental profile management is more than useful and important.

However, we should not overestimate it, and that is why we want to point out that there are also some risks and disadvantages of such interconnecting in terms of a financial and environmental audit.

2. RISKS RELATED TO INTERCONNECTING FINANCIAL AND ENVIRONMENTAL ACCOUNTING

The primary risk related to interconnecting financial and environmental accounting is that an enterprise may publish environmental information regarding environmental risks, environmental impacts, rules, strategies, tasks, expenses, debts or the efficiency of an

accounting unit in the annual report or in the annex to the financial statement², but this information is not given explicitly (is hidden) in the financial statement.

This is stipulated in following legislation – Act No. 563/1991 on accounting and Federal Ministry of Finance Measure V/20 100/1992 from July 15, 1992, which regulates the accounting scheme and procedures for entrepreneurs - and later versions stipulate the obligatory accounting scheme for entrepreneurs.

Environmental assets, liabilities, expenses and revenues (pursuant to the definition of an environmental information), however, do not correspond with the definitions of the existing legal regulation (accounting scheme) in many cases, so they cannot be stated in the standard way. It is possible to have them on analytical accounts, but these accounts are connected with synthetic accounts in the statements. This leads to misinterpreting the actual financial situation and efficiency of the enterprise in terms of meeting environmental profile criteria, and consequently to misinterpreting indicators of the financial analysis regarding environmental aspects. The result of this is that it has not been possible yet to monitor environmental information regarding financial and economic analyses in the accounting statements (balance sheet and profit and loss statement).

Interesting information on the environmental profile of a company is possible to provide in the annex to the financial statement only. As stated in the Act No. 563/1991 on accounting, § 18 (3): “The annex contains information regarding assessment methods, depreciation methods, accounting methods used in a relevant accounting period and information which is important for the assessment of assets and payables, of the financial situation and the economic result of an accounting unit.“ The differentiation of expenses may be later monitored using the analytical register in the financial accounting, which enables separating environmental financial accounting from the traditional financial accounting. This enables us to find out information on indicators of environmental profile management as well as on environmental expenses. Moreover, the annex of the financial statement may also include environmental information on inventory differentiating, on clients etc.

There is still another difficulty related to the environmental accounting – it has not been possible yet to monitor revenues from environmental protection, which is indispensable for complex information on the environmental profile of an enterprise.

Monitoring environmental protection revenues would be possible through monitoring investments into the environment, however, it is not possible to guarantee any complex view. Therefore, there is a risk of misinterpreting the actual state.

CONCLUSION

Environmental financial accounting is a part of traditional accounting system in which environmental aspects are differentiated and emphasized. Its aim is to monitor and record environmental financial impacts caused by activities of an enterprise, by its products and services .

It is important to emphasize that getting information for indicators of the environmental profile management by interconnecting financial and environmental accounting (environmental financial accounting) is a relevant way of getting information on

² We would like to emphasize that this information may occur in the annex to the financial statement only, because the financial statement (pursuant to the legal regulation of the Czech Republic) does not contain information on the environment, neither in the balance sheet, nor in the profit and loss statement.

the real financial position and environmental profile of an enterprise. However, this way of getting information should not be the main one, especially due to the risks mentioned above. Another reason for this is that environmental accounting in the Czech Republic has not been fully established yet, and is not in compliance with existing legal regulations (mainly regarding accounting schemes).

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TRACKING OF ENVIRONMENTAL COSTS IN ENTERPRISES OF CHEMICAL INDUSTRY

Jaroslava Hyršlová

Enterprises of chemical industry are aware of a need to manage impacts of their activities, product and services to the environment. Environmental costs management has definitely its significant role within environmental management. Environmental costs comprise the costs of steps taken, or required to be taken, to manage the environmental impacts of an enterprise's activity in an environmentally responsible manner, as well as other costs driven by the environmental objectives and requirements of the enterprise. Examples include costs of disposal and avoidance of waste, preserving or improving air quality, cleaning up oil spills, removing asbestos from buildings, researching for more environmentally-friendly products, carrying out environmental audits and inspections, etc. This paper is dealing with issues of allocation of environmental costs in enterprises of chemical industry. It shows changes in an approach to allocation of environmental costs in the ninetieth of the 20th century, which were evoked by a distinct grow of environmental costs and an effort of enterprises to monitor, evaluate and improve environmental performance.

Environmental costs are often treated as overhead costs in accounting systems of chemical enterprises. Overhead costs can include, for example, these environmental costs: costs of monitoring and measuring of contamination, labour costs of internal auditors, costs of waste disposal, operating costs of end of the pipe technologies, environmental pollution fees, etc. Environmental costs are mostly indirect costs. They are not, therefore, allocated to an appropriate object (product, department, activity) directly. They refer to several objects and so they are allocated by using cost-allocation bases (allocation keys).

When environmental costs are allocated correctly to products, departments and/or activities, which cause them, an enterprise can motivate managers and employees to search for alternatives for prevention of pollution or to suggest such actions, which would lead to decreasing of environmental costs and increasing of profitability. Environmental costs management then leads to improving of environmental performance of an enterprise, to increasing of environmental quality, and to improving of enterprise's economic results.

The 1st approach - environmental costs as a part of overhead costs

The 1st approach of environmental costs allocation was based on following principle: a lot of environmental costs were treated as overhead costs (manufacturing overhead, administrative expenses). Overheads were allocated to products, departments and/or activities according to cost-allocation base chosen by an enterprise. Let's introduce very simplified case of this environmental costs allocation. Figure 1 shows accounting system, in which environmental costs are together with other items (for example: management salaries, rent, other administrative expenses, etc.) a part of overhead costs. Let's assume that the enterprise produces two products - product A and product B. Overhead costs are allocated to products in a ratio, which relates to consumption of direct labour and direct material for the production. Toxic waste is an output of production of the product B. Costs of toxic waste disposal are, however, a part of overhead costs. Then, it is evident, that in this case a part of toxic waste disposal costs is allocated to the product A, which does not cause them, and therefore should

not be liable for them. Result of the allocation procedure is a distortion of actual costs of products A and B.

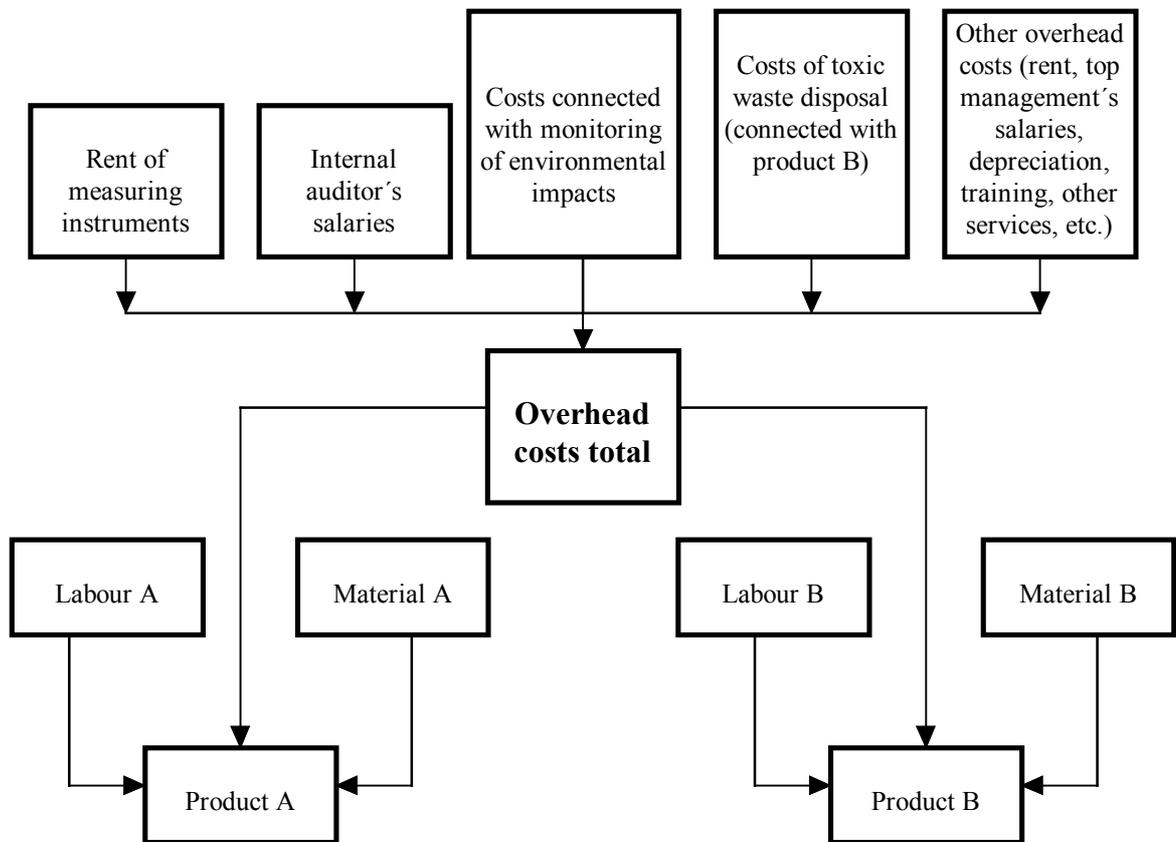


Fig. 1 Allocation of environmental costs (environmental costs are treated as overhead costs)

Considering the above mentioned case it is clear that allocation of overhead costs to appropriate objects results from incorrect base. Costs of particular objects are determined inaccurately - some objects are charged more than it would be appropriate, whereas other objects bear lower costs than corresponds with reality. Result of such allocation procedure is incorrect cost accounting of individual products, which projects in product's profitability. Also pieces of information about costs of a particular operating departments, plants and/or activities are incorrect. Information about a product's, plant's, or activities' contribution in environmental pollution is erroneous as well. In such cases, accounting system does not provide correct information for decision making, which would aid in seeking of new ways to reduce enterprise's costs and to improve environmental performance.

Let's introduce an example of the above mentioned approach (Figure 2). Let's assume that the enterprise produces two products - product A and product B. Production process is realised in three production centers. There are 4000 kg of raw materials as an input of an production process. This amount of raw materials is used to produce 500 kg of the product A and 500 kg of the product B. Solid waste substances and liquid waste are formed during production. Solid waste (total amount of 800 kg) is disposed in end of the pipe technology - incinerator of solid waste. Liquid waste is cleaned in waste water treatment plant. Volume of

waste water corresponding with the production is 2200 kg (2,2m³). Table 1 shows waste flows connected with production of products A and B.

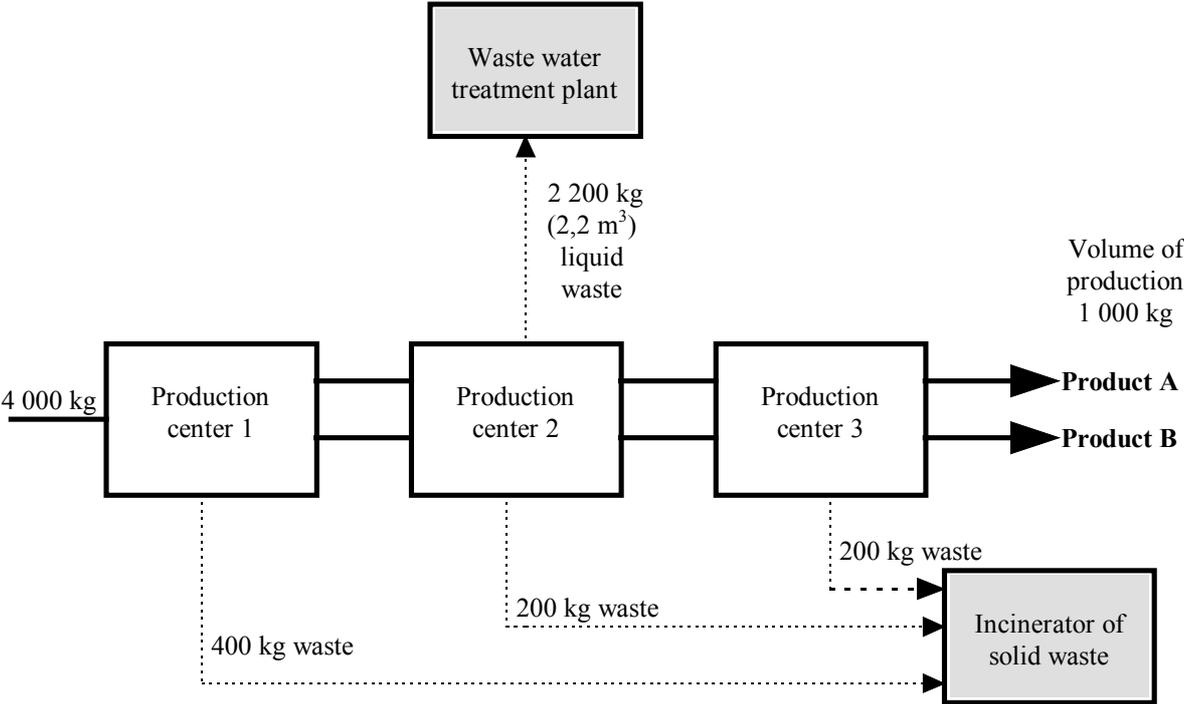


Fig. 2 Production process scheme

Table 1 Waste flows connected with production of products A and B

	Production center 1	Production center 2	Production center 3	Total
Product A	200 kg solid waste	200 kg solid waste	100 kg solid waste	500 kg solid waste
		2 200 kg liquid waste		2 200 kg liquid waste
Product B	200 kg solid waste	-	100 kg solid waste	300 kg solid waste

It is necessary to expend following direct costs to produce 500 kg of the product A (it is the same for 500 kg of the product B):

- material 196 000 monetary units,
- labour costs 12 000 monetary units,
- other direct costs 4 200 monetary units.

Manufacturing overhead costs for 1 000 kg of products are 40 110 monetary units. Environmental costs of incinerating of solid waste and waste water treatment are included in manufacturing overhead costs. The total of all environmental costs is 20 110 monetary units. On the assumption that we will proceed according to previously used methods and cost-allocation base to allocate manufacturing overhead costs to products A and B will be volume of labour costs then calculation of total (direct and indirect) manufacturing costs (in monetary units) for the whole production volume will be following for products A and B:

Product A	500 kg
Material	196 000
Labour costs	12 000
Other direct costs	4 200
Manufacturing overhead costs	20 055
Total manufacturing costs	232 255

Product B	500 kg
Material	196 000
Labour costs	12 000
Other direct costs	4 200
Manufacturing overhead costs	20 055
Total manufacturing costs	232 255

The 2nd approach - differentiation of environmental costs and their twofold allocation to the production centers and cost carriers (products)

Since the ninetieth of the 20th century the environmental costs have increased significantly. Enterprises have appreciated the importance of information about environmental costs. In connection with implementation of upgraded information systems the enterprises have interested in problem of the environmental costs allocation.

In this stage, enterprises have paid attention primarily to allocation of environmental costs, which have reached considerably high values. In enterprises of chemical industry such costs are operating costs of end of the pipe technologies (waste water treatment plants, incinerators) and environmental pollution fees. Significant environmental costs are separated from overhead costs and are allocated first to the responsible production centers and then to products. Separating of environmental costs from overhead costs and their corresponding allocation to production centers and products give to management clearer and better overview of center's costs and of total costs of particular products.

Figure 3 demonstrates the allocation of operating costs of environmental cost centers (the example illustrates environmental costs allocation on the basis of the production process scheme - see Figure 2). The 1st step shows allocation of costs, which are caused by operating of end of the pipe technology (it is a cost center), to production centers that created of waste flows. The 2nd step represents costs allocation from production centers to the cost carriers (i.e. products).

The incinerator of solid waste and the waste water treatment plant are the cost centers. Total costs of the incinerator, adequate to process 800 kg of waste, is 20 000 monetary units. Costs of total amount of disposed liquid waste are 110 monetary units.

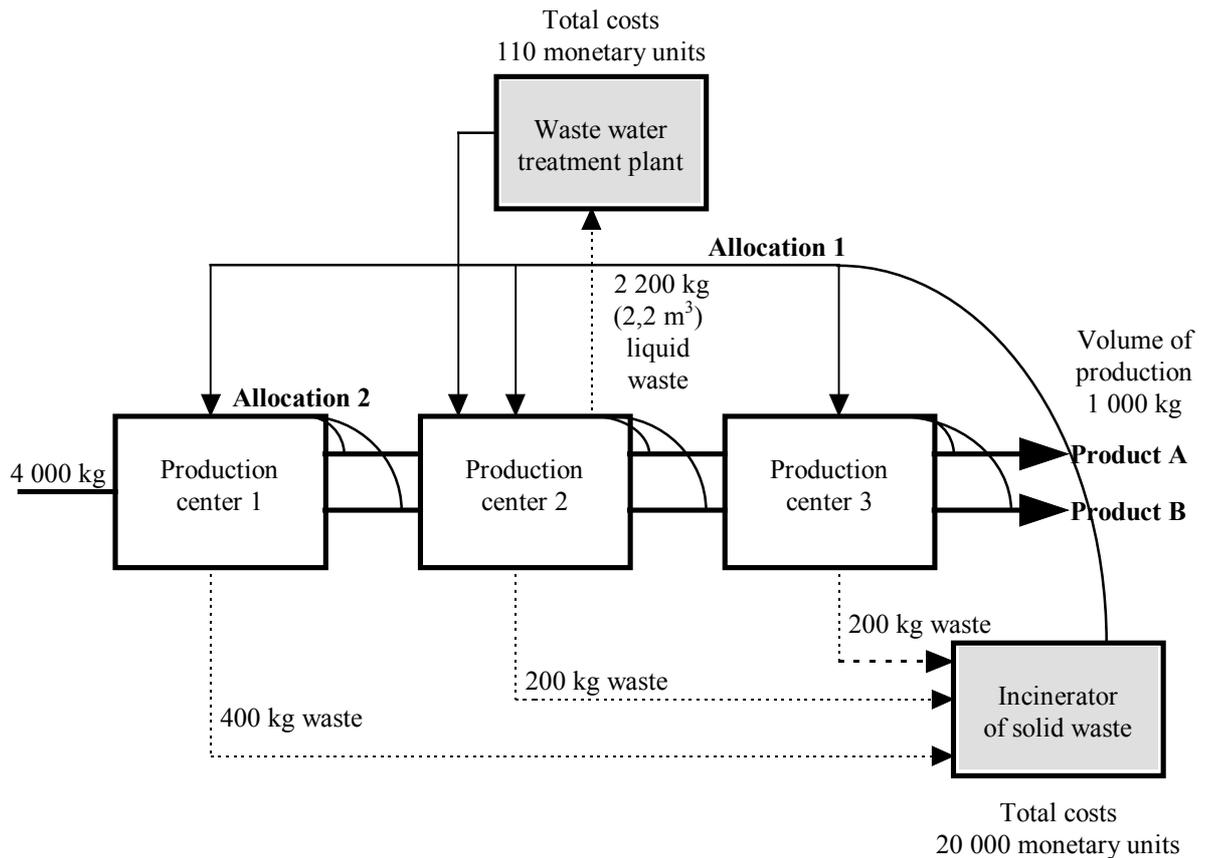


Fig. 3 Allocation of costs of the environmental cost centers

For the 1st step of allocation of costs related to disposal of solid waste, it is necessary to know not only total costs of incinerator but also to review if incinerated wastes of different kinds cause same costs. In our example we assume that incinerating of 1 kg of waste of any kind causes same costs, i.e. incinerating of 1 kg of waste costs 25 monetary units. Therefore, after the 1st step of the costs allocation, considering mentioned conditions costs of incinerating of solid waste are in particular centers following:

- production center 1 10 000 monetary units,
- production center 2 5 000 monetary units,
- production center 3 5 000 monetary units.

The different situation is in allocation of costs caused by waste water treatment. Due to formation of liquid waste in the production center 2, costs of waste water treatment plant are allocated only to this center.

Environmental costs after the 1st step of allocation are, therefore, in particular production centers following:

- production center 1 10 000 monetary units,
- production center 2 5 110 monetary units,
- production center 3 5 000 monetary units.

Allocation of environmental costs to products A and B comes in the 2nd step.

When allocating of environmental costs to products a cost-allocation base should reflect costs of waste treatment (incineration and purification in our example). Waste was formed by production of products A and B in particular production centers. It is clear that amount of environmental costs related to particular products generally depends on volume of formed waste during the production, on a type waste and on a way of waste disposal.

Let's assume that in our example production process of products A and B causes formation of solid and liquid waste streams in particular centers in volume as it is described in Table 1.

If we allocate monetary units to waste streams based on previously mentioned conditions (cost of incinerating of 1 kg of solid waste is 25 monetary units, cost of total waste water treatment is 110 monetary units), then environmental costs allocated to the product A are 12 610 monetary units and to the product B 7 500 monetary units (see Table 2).

Table 2 Environmental costs of products A and B (in monetary units)

	Production center 1	Production center 2	Production center 3	Total
Product A	5 000	5 110	2 500	12 610
Product B	5 000	-	2 500	7 500
Total	10 000	5 110	5 000	20 110

Mentioned environmental costs then appear in calculation of total manufacturing costs of products A and B in calculation items: costs of incinerating of solid waste and costs of waste water treatment. Calculation of total manufacturing costs (in monetary units) for the whole production volume of products A and B will be following:

Product A	500 kg
Material	196 000
Labour costs	12 000
Other direct costs	4 200
Environmental costs:	12 610
✓ Costs of incinerating of solid waste	12 500
✓ Costs of waste water treatment	110
Other manufacturing overheads	10 000
Total manufacturing costs	234 810

Product B	500 kg
Material	196 000
Labour costs	12 000
Other direct costs	4 200
Environmental costs:	7 500
✓ Costs of incinerating of solid waste	7 500
✓ Costs of waste water treatment	-
Other manufacturing overheads	10 000
Total manufacturing costs	229 700

Comparison of both approaches to the allocation of environmental costs

Mentioned examples demonstrate inaccuracy of calculation of total manufacturing costs in case, that operating costs of environmental cost centers are a part of manufacturing

overhead costs and that direct labour is used as a cost-allocation base. Correct calculation expects that data, which are taken over and then processed, are credible. However, credibility of calculation cannot be ever absolute because complexity and large heterogeneity of real cost flows is an objective cause of implementing a large number of costing methods directly connected with accounting and cost planning. Actual costing has a significant importance in management. Rationality of producing particular product is verified based on calculation. And evaluation of final profitability and efficiency is based on comparison of particular types of calculations.

Now we can demonstrate by this example following points:

- separating of environmental costs from overhead costs and their allocation to production centers and then to products give more accurate information for costs management - adding of items, which record data about significant environmental costs, into costing table and into intra-enterprise reporting provides important information for management by products line, departments line or activities,
- information about environmental costs included in calculations has an important role in management of impacts of products, activities and services on the environment; information is used by management, costs analysts, technicians, design engineers, constructors, research workers and other interested parties,
- information about environmental costs is a base for project assignment and actions to reduce costs and to improve environmental performance of an enterprise.

It is fundamental to choose proper cost-allocation base (allocation keys) to acquire adequate information about environmental costs. Allocation key is also important to be closely connected to real environmental costs. In practice choice of keys to allocate environmental costs is, according to our experience, influenced by volume of emissions, solid waste and waste water treated, their toxicity and induced relative costs of treating different kinds of emission.

To be able to properly allocate operating costs of environmental cost centers, it is necessary to obtain information about flow of material, water, energy and waste, which is created with products. We have to know volume and environmental impact of waste flows in accordance with reference to usage of facilities for waste disposal, regulation of contamination, and level of difficulty to their decomposition. Detailed and accurate information about waste flows in all states is possible to obtain by monitoring with use of measuring instruments. This solution is, however, very expensive business in many cases and also in a large number of cases measuring instruments are not available.

When allocating of environmental costs we must consider whether any exceptional event happened in a period, for which allocation is made, for example an accident in any facility. Consequences of an accident should be definitely assigned to a department, which caused such accident, and should not be redistributed to all departments.

The second step of an allocation can be questionable in some chemical enterprises. According to our experience, costs are allocated to products, for example, according to proportion of gross sales of a particular product in gross sales of whole production center. Cost-allocation base should, however, reflect costs of disposal of waste, which was caused by products. Amount of environmental costs assigned to particular products generally depends on volume of created waste, its type and a way of its disposal.

To conclude, we can say that the cooperation of economists, technologists and environmentalists is necessary to correctly allocate environmental costs. Environmental costs

associated with several objects should be allocated only after realising a comprehensive analysis. Its output should be a base according to which appropriate objects are assigned by costs, which correspond with their contribution. In enterprises of chemical industry environmental costs certainly belong among those items, which significantly influence economic result of an enterprise and its financial situation, therefore, it is necessary to pay enhanced attention to them.

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WHAT IS THE PRESENT-DAY ACCOUNTING RELATING TO THE ENVIRONMENT?

Wojciech A. Nowak

1. Introduction

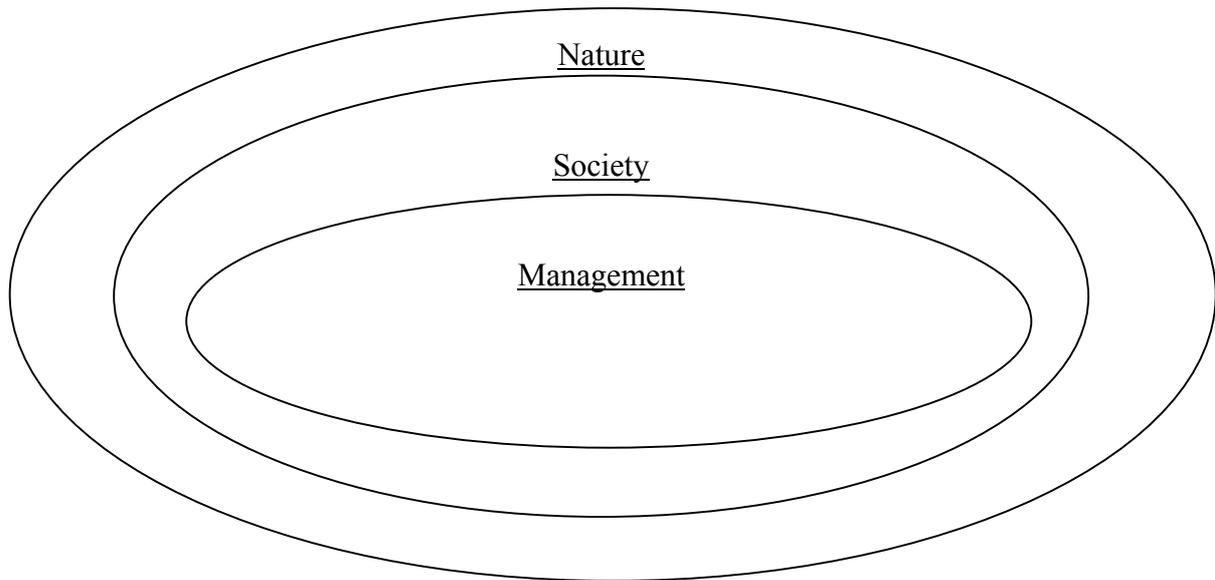
The last decades of the 20th century so strongly increased the importance of the matters of the human environment that they penetrated up to the field of the practice and teaching of accounting. The causes of this penetration have very deep roots. Indeed, four hundred years after the scientific revolution initiated in the period of the Revival the mankind gained the instruments and sorts of effects that permit the destroyal of their environment. Due to this, two hundred years from the revolution in social ethics carried out by the philosophers of the Revival period who cast doubt on the right of the kings to rule absolutely over their subservients, the man, the king of all the creatures faced the question whether he can destroy the environment in which he lives? Although the unconscious answer *no* to this question seems quite obvious, even a glance into the activity of the organizations oriented at the generation of economic profit for the owners or enterprises points to the fact that this generation is still to the detriment of the environment and social progress.

The range of negative effects on the environment reached an extent that caused serious concern both in the wide public and in the ranks that are interested more by the function of the enterprises. Apart from this, at the level of the world business a stronger awareness occurs of the fact that the continuity of the existing ways of activity leads in the predictable future to the situation in which there will be nothing "to make profit of".

And yet, the society originated within the framework of the nature and for meeting its needs it created the management located both in itself and in the nature. And so, man should rule over the management in the way enabling meeting his needs without possible destroyal of the natural environment, without cutting the roots. This situation is shown in **Scheme 1** the information role of which can hardly be overlooked.

Scheme 1

Nature – Society - Management



This scheme shows markedly to the workers of accounting that in the final consequence they should be directed at the preparation and communication of credible information usable for such a way of management of economic reserves and related with them duties so that the management might serve for meeting the needs without making harm to the nature¹ and society. The latest protests of the adversaries of globalization and their causes witness to what forgetting it at present, perhaps by the major companies of this world controlling policy, may lead.

2. The subject of accounting relating to the environment

This subject can be defined remembering that accounting is a system of measurement – in the retrospective, current and prospective aspects – and communication relating to the conditions and results of the use of economic sources and the realization of duties connected with them, and the environment, it is the physical environment of man, including the air, water, the flora, fauna and unrestorable sources of fuels and minerals that can be mined. Consequently, the subject of accounting relating to the environment will be the conditions and results of use of the sources of the natural, physical environment of man used in the management and the economic duties related to them. **Scheme 2** shows the costs (relating to the environment) of the activity of an economic subject within the context of the total amount of costs that it generates.

¹ Nature or the natural environment or simply the environment.

Scheme 2

3. Structure of accounting relating to the environment

We present the current state of accounting relating to the environment in the example of the structure of one of the most significant world manuals in this field which is shown in Scheme 3. The presentation of this structure serves us, at the one hand, for presenting the elements and arrangement of the content of the current accounting relating to the environment, at the other hand, for demonstration of the fact that it left the stage of a craft and achieved the development stage permitting the origin of a significant work that can help in the realization of research and education at the university level and at the level of somehow better theoretically prepared practitioners. One of the central terms included in it is ecological information by which the science is understood about the impacts of enterprises on the environment.

To maintain a clear convention instead of a more detailed discussion of Scheme 3 we suggest the reader may study it carefully.

Scheme 3

Current accounting relating to the environment

1. Purpose and Structure

Part I. Presentation of accounting relating to the environment

2. The origin of accounting relating to the environment

- 2.1. Historical causes of the origin
- 2.2. Pressure of those taking an interest
- 2.3. Changes of relation of the costs
- 2.4. Negligible coordination of collection of data on the environment

3. The aim of management of information about the environment

- 3.1. Information about the natural environment as targeted science
- 3.2. An inevitable target
- 3.3. A balanced development
- 3.4. Ecological efficiency of manufacturing plants
- 3.5. Relation between balanced development and ecological efficiency
- 3.6. Supporting of balanced development of the plants and their ecological efficiency as the task for managing accounting
- 3.7. The other targets of accounting relating to the environment
- 3.8. Information needs caused by the operationalization of the concept of balanced development of manufacturing plants and their ecological efficiency

4. Structural framework of accounting relating to the environment

- 4.1. The extent and structures of the systems of accounting relating to the environment
- 4.2. The effect of those taking an interest on the problems of accounting relating to the environment

Part II. Questions connected with the environment in classical accounting

5. Summary of problems of classical accounting, comments on them and their merits
 - 5.1. Comments on classical accounting and its merits
 - 5.2. Accounting of financial consequences of impacts on the environment
6. Managing accounting relating to the environment
 - 6.1. Costs and merits of considering balanced development and ecological efficiency
 - 6.2. Topical methods of accounting costs relating to the environment
 - 6.3. Depiction and allocation of costs related to the environment
 - 6.4. Allocation of induced costs due to the effects on the environment
 - 6.5. Financial consequences induced due to the effects on the environment and assessment of the efficiency of investment
 - 6.6. Balanced card of realization
 - 6.7. Summary
7. The questions related to the environment in accounting and financial reporting
 - 7.1. The effect of those taking an interest on financial accounting
 - 7.2. The costs induced by the effect on the environment – assets or expenses?
 - 7.3. The approach to induced expenses related to the environment
 - 7.4. The approach to induced changes understood from the point of view of the environment within the framework of financial volume of the assets elements
 - 7.5. The approach to liabilities
 - 7.6. The approach to emission limits
 - 7.7. Analyses and commentaries of the management
 - 7.8. Summary
8. The value of the enterprise for its owner after considering the aspect of the environment and also the questions related to the environment in other approaches to accounting
 - 8.1. Standardization of financial reporting and the value of information for the investor
 - 8.2. The substance of the conception of value for the owner, its merits and defects
 - 8.3. In what manner does the management related to the environment effect the value for the owner?
 - 8.4. The consequences of management related to the environment
 - 8.5. Summary

Part III. Ecological settlement

9. Survey of the taxation origin problems of the cycle of life and ecological settlement

10. Efficiency of approaches to the management of information related to the environment

- 10.1. The information related to the environment as the subject of measurement
- 10.2. The total data and the model
- 10.3. Convention of ecological settlement
- 10.4. Consolidation
- 10.5. Summary

11. Internal ecological settlement

- 11.1. Basic procedures and their historical development
- 11.2. Formation of accounts and records
- 11.3. Aggregation
- 11.4. Estimate of the effect of the environment
- 11.5. Allocation
- 11.6. Ecological indicators
- 11.7. Ecological assessment of investments
- 11.8. Current net value of the future, added effects of the environment
- 11.9. From internal to external ecological accounting

12. External ecological settlement and reporting relating to the effects on the environment

- 12.1. Regulations introduced by those taking an interest and other motifs
- 12.2. The subsequences of topical regulations requiring reporting in relation to the effects of the environment
- 12.3. Convention of ecological settlement
- 12.4. Consolidation
- 12.5. Summary

Part IV. Integration of classical accounting and ecological settlement

13. Integration with the ecological efficiency indicator

- 13.1. Convergence of the interests of economy and the interests of the environment
- 13.2. Integration of the systems of management of information
- 13.3. Formation of ecological efficiency indicators
- 13.4. Benchmarking
- 13.5. Limits and key criteria
- 13.6. Summary and implications

14. Integration of the management of the system of information directed at ecological efficiency and of the plant system of management related to the environment

- 14.1. Standards of the management related to the environment at the level of the plant
- 14.2. Methods of management related to the environment at the level of the plant
- 14.3. Managerial ecological control (managing)
- 14.4. Summary

15. Summary

Let us point to the fact only that the elements of accounting related to the environment are parts of classical financial accounting and managing accounting which are well-known to us. They are also included into the management by the value of the enterprise. On the contrary, a separate field is ecological settlement, called also ecological accounting. The substance of this settlement (ecological accounting) is measuring and announcing the effect of the enterprise on the environment in numeral expressions, while the figures are shown in the form of natural units. Making use of exclusively natural units decisively does not make commercial use of the environment easier by the firms oriented at profit which is considered by the supporters of the so-called "deep ecology" a major merit of this settlement.

Ecological settlement is the chart of the system of management of information (related to the environment) which is a part of the system of management relating to the environment. From another point of view ecological settlement is also a part of managerial information and as such it is to be integrated with it. On this ground it is integrated with accounting, understood classically² which led to the origin of the methodology of integration and pointed to the prospects of cross-section approaches. At the same time, the prospective approaches also include the economic aspect and the ecological aspect and find their synthesis in ecological efficiency. It is necessary to point out that the structure of ecological settlement is analogous with the structure of accounting with the exception of the monetary unit which is not to be found in ecological settlement. This, of course, makes easier the approximation and integration of both structures and provides new possibilities of strengthening the positions of the workers of accounting.

4. Advantages from accounting relating to the environment

In accounting the opinion was adopted that obtaining information has a sense if the widely understood advantages from their disposal exceed the costs of obtaining them. Because the assessment of the costs is, as a rule, much easier than the assessment of the advantages, it is worth to concentrate on the latter in the next part. We will make use once more of a demonstrative approach and we will show the advantages of considering the

² Perhaps, to define it we should use the term *economic accounting*.

questions of the environment by examples from practice. These examples do not include the pure problems of accounting relating to the environment *expresis verbis*, it is true, but they show in a suitable manner the spheres of occurrence of the above-mentioned advantages and the possible role of this accounting in presenting them.

The first example of the advantages related to the keeping of accounting and reporting relating to the environment will be from the field of financial institutions and, in particular, from the field of banking. In fact, it is possible to notice that at present the credit activity of the banks has a significant effect on the relations between the credited organizations and the environment. These relations originate both due to the banks turning attention to the aspect of the environment and – at the same time – due to concealing this aspect. Our documentary bank will be a major, Swiss banking group called UBS, encompassing by its activity a large part of the most advanced countries of the world. Its economic characteristic is shown in **Scheme 4**.

Scheme 4

UBS: Fakty i liczby za rok 1999

Przychody operacyjne	CHF 28.621 mln
Koszty operacyjne	CHF 20.452 mln
Zysk operacyjny przed podatkami	CHF 8.169 mln
Zysk netto	CHF 6.300 mln
<hr/>	
Stopa zwrotu z kapitału udziałowego	21,2%
<hr/>	
Kapitalizacja rynkowa	CHF 92.642 mln
Aktywa ogółem	CHF 981.573 mln
Kapitał udziałowy	CHF 34.835 mln
Wskaźnik BIS Tier 1 (kapitał i rezerwy)	10,6 %
<hr/>	
Aktywa przyjęte w zarząd od klientów	CHF 1.744.000 mln
Zatrudnienie ogółem	49.058
w tym w Szwajcarii	32.747
Ratingi długoterminowe	
Moody's, New York	Aa1
Fitch/BCA, London	AAA
Standard & Poor's, New York	AA+
BankWatch, New York	AA

The spheres of activity of the UBS are as follows:

- Assets management (entrusted by the customers) (*Asset management*)
- Investment activity (*Investment banking*)

This includes brokerage activity and investment consultancy in the field of purchase, disposal and sale of assets and also in the field of increasing the capital and the field of risk management.

- Credit activity / loan (*Credit Business*)
- Internal activity (*In-house Activities*).

Those taking an interest invest into the UBS because its strategy offers interesting, future cash flows (*future free cash flows*). The total amount of the future, free cash flows has a significant effect on the value of every enterprise and, therefore, also on the value of the bank firm UBS – this, in turn, has an effect on the price of the shares.

The financial flows themselves depend on diverse factors (the so-called orientors), determining the value of the enterprise. The basic so-called orientors of the value of the bank enterprise UBS are:

- the growth of income,
- ensuring profits (*incremental provisions*),
- costs of capital,
- gross margin,
- reputation.

The report of UBS for 1999³ shows the effect of the environment factor on the "orientors" of the value of the enterprise which are formed, especially, by:

- the duties of the UBS in relation to the environment,
- the competencies / expertise of the UBS in relation to the environment,
- the overall, all-including system of management of the UBS in the field of the environment, certified according to standard ISO 14001.

Following up with the above-mentioned report the UBS sees the advantages from considering widely the aspect of the environment as follows:

1) Growth of income

It plays the decisive role in the management of assets entrusted to the bank – the larger the amount of managed sources, the larger the income from charges and commissions.

UBS competence, not subject to discussion, in the field of professional analysis of the factors related to the environment and the society is an important, supporting element in competing for new income and a strong argument for keeping the existing portfolio packets.

³ The structure and content of such report is the question which by itself is enough for a separate article. Due to that reason we will leave them out.

This kind of *know how* is appreciated all the more by institutional investors, especially by pension funds.

2) Ensuring of profits (provisions) / income

It must be realized, first of all, due to the risk of bad credits. The money blocked in these securities discontinue to be available freely for UBS and its shareholders. Therefore, it is in the interest of UBS to avoid the securities of this kind, first of all due to turning special attention to the risks of the environment and the economy, accompanying the credit and investment activities. Such a procedure increases the accessibility of free funds which has a positive effect on the way of reception of UBS by the investors.

3) Average, weighted costs of capital (WACC) and discount rate

The volume of the average, weighted cost of capital is the indicator of the assessment by the participants (actors) in the financial markets of the quality of the future, free cash flows. The larger the confidence of the investors and analysts to the size and quality of free flows of the enterprises, the lower the WACC. And, because the investors and analysts discount the future free cash flows by means of the average, weighted cost of the capital, then the size of WACC has a direct effect on the prices of the shares of the company.

The professionalism of UBS in the field of analyses of the risk of the environment supports the achieving of future, free cash flows. Due to this it becomes another, positive factor in the determination by the analysts and investors of the level of average cost of capital and height of discount rate.

4) Gross margin

The investments into the ecological aspect of internal activity of the bank increase its ecological efficiency. An improvement of the interferences into the environment (decreasing the consumption of sources, a lower level of emissions into the environment) can lead to decreasing of annual costs. Due to this the gross margin strengthens which has a positive effect on the assessment from the part of capital markets.

5) Reputation

The reputation of the enterprise depends to a no small extent on its reputation. Reputation builds on the confidence of the customer and owner. This confidence has a significant effect on the growth of income and on average, weighted costs of the capital.

The main factors conditioning the reputation of UBS – and, consequently, also its success – are (acknowledged in the international extent) the competencies in the field of management (relating to the environment) and readiness to a reliable access to responsibility in relation to the society and the environment.

The second example of engaging in the aspect of the environment is of home origin. It is the since 1991 existing enterprise ABM Solid from Tarnowo, dealing with the production of heaters on the basis of fluid combustion and consultancy in the field of technology of the environment. In 1998 this enterprise joined the programme **Pure Business**, promoted by the

Foundation Partnership for the Environment which has its seat in Krakow. This enterprise got acquainted with standard ISO 14 001 and introduced the system of management relating to the environment (Environmental Management System – EMS). The advantages ensuing from the application of this system were described in 2000 in western literature by Rafal Serafin, the Director of the above-mentioned Foundation. He summarized them in the following manner:

- processing the problems relating to the environment,
- monitoring and reduction of costs of energy,
- perfecting the procedures of emergency procedure, stressing the questions of the health and safety,
- overall improvement of the system of management and planning (despite the relatively minor impact of the enterprise on the environment),
- subjectivization of the employed and growth of their morals,
- the General Manager is elected the "Manager of the Year" of the Poland Minor Voivodina,
- ABM Solid has become one of the most active members of the Tarnowo Chamber of Commerce,
- Becoming aware of the fact that the technology "friendly" to the environment is the largest development chance for ABM Solid.

The differences in the way of perceiving the advantages of the assertion of the aspect taking regard of the environment in both above-mentioned examples can, in fact be placed to the debit of the differences in the degree of openness for viewing the enterprise as an instrument of generating economic profits for the owner and the degree of awareness of the orientors of the value of the enterprise. In any case, these advantages are quite obvious both in the case of the financial firm concentrating its activity in the most advanced countries, and in the case of the industrial enterprise operating in the country which transfers from central planned economy to market economy.

5. Summary

The accounting relating to the environment acquired the present-day form on the basis of practice under the conditions of the market and globalization, with a substantial support from the part of science. Its approaches, measuring and reporting models have achieved the level of maturity already, enabling the first trials of standardization in the worldwide extent. Its high economic and social importance ensues from the potential of its effect on the formation of positive relations of the individual organizations on the natural and social environment and, consequently, on the widely understood quality of life and social development. In this context it is a part of the accounting of balanced development, i.e. of the development which harmonizes the economic, natural and social aspects. In the world such way of development is considered the model for the future period.

Also in Poland, in our own interest we should think over the accounting relating to the environment again as quickly as possible and think over the way of making use of it in practice. It becomes more substantial and urgent when the European Union initiates and promotes the questions of the natural environment and accounting (related to the environment) in relation to the member countries and candidate countries.

If we have a general idea of the substance of accounting relating to the environment, next it would be worth look more closely at the approaches and models pertaining to financial accounting and managerial accounting.

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ENVIRONMENTAL EXPENDITURES IN THE CZECH REPUBLIC

METHODOLOGY OF THE STATISTICAL SURVEY

Alena Pražáková, Eva Hájková

The body responsible for the environmental protection expenses statistics is the Czech Statistical Office. Reporting duty is embedded in the national Program on Statistical Surveys, which passes government every year.

Statistical survey on environmental protection expenses has been carried out since 1986. The value of fixed assets devoted to environment pollution control projects is surveyed. This inquiry is included into the annual cross-sectional statistical questionnaire on gross investments. That questionnaire is designed for organisations belonging to the sector of non-financial enterprises with 20 and more employees; the sector of financial institutions irrespective of the number of employees; budgetary, subsidized and non-profit organisations; public universities, municipal and regional authorities and other legal entities established for special purposes according to law, disregarding the number of employees and the extent of investment.

The table concerning environmental investment is very simple. Six environmental domains are laid out vertically in the first column each one in single row. The rows are split into columns. The second column is used for total investment into individual environmental domains. Financial resources are inscribed in the headings of next columns.

The mentioned six environmental domains are:

1. Water protection (except groundwater)
2. Air and climate protection
3. Environmentally sound waste management
4. Landscape and nature conservation
5. Reduction of the impact of physical factors
6. Protection of the soil and groundwater

Financial resources for the environmental protection:

1. Internal sources
2. Credit
3. Support from public budgets
4. Grants and subsidies from abroad
5. Other

All other needed important data are taken from the main body of questionnaire. It is identification number of enterprise, code of I-Sector of National Accounts, code of NACE classification, region of investment and total investment to calculate a percentage of investment on environmental protection.

Methodology notes, which ease filling in the questionnaire, are component part of it. These notes contain an overview on the types of investments, which have link to the protection of the environment.

At present time the questionnaires have been mailed to 32 500 respondents, about 2500 of which return the part concerning the investment focused on environmental protection positive.

The questionnaires are distributed in the beginning of January and the deadline for return is set on 30th March every year. Questionnaires are processed in the special department of our Statistical Office, which is focused on the data processing for investment statistics only. Several inter-correlation checks, which help to eliminate a number of errors made by respondents, are important part of this process.

The questionnaires with positive item on environmental investments are processed preferentially because of reporting obligatory towards the Ministry of the Environment. First preliminary output is usually made by the end of August. The preliminary result on the environmental investment is provided to the Ministry of the Environment, where these figures are used for the regular Report on the Environment submitted to the Czech government.

Processing of other questionnaires continue till the end of December because of those enterprises which apply audit and thus send the questionnaire on investment with delay.

Within March the final file of clear verified data is committed to the Department of Agriculture, Forestry and Environment Statistics. This department is responsible for both methodology used and data dissemination.

Final result is known in April. It means, that data for reference year are available with 16 months delay caused by enterprises using audit.

We receive additional information concerning on environment protection activities and pollution abatement control from the State Environmental Fund, National Property Fund and the Ministry of Finance to complete overview of environmental costs in our country.

Data utilization and dissemination

The structure of database allows us to create tables in several types of data breakdowns.

On the base of obtained information from questionnaire we are able to provide data according to these breakdowns:

- Environmental domains
- Structure of financing
- Structure of ownership (private, cooperative, state, municipal, clerical)
- I-Sector of National Accounts
- NACE code
- Region of investment utilization

Data on environmental expenditures are provided, except to the Ministry of the Environment as mentioned above, to the Eurostat through the Joint OECD/Eurostat Questionnaire on the State of Environment.

Data are published in the Report on the Result of Statistical Survey every year, which is prepared immediately after the survey is finished.

Data are published in these annual yearbooks:

- Statistical Yearbook of the Czech Republic edited by Czech Statistical Office;
- Statistical Environmental Yearbook of the Czech Republic, which appears as a joint publication of the Ministry of the Environment and the Czech Statistical Office;
- Information on the Environment in the Czech Republic edited by CZSO;
- Report on the Environment in the Czech Republic, annually published by the Ministry of the Environment.

Alena Pražáková, Eva Hájková, The Czech Statistical Office

ENVIRONMENTAL ACCOUNTING FROM THE VIEW OF ENVIRONMENTAL POLICY

Květoslava Remtová

1 Environmental Accounting

Environmental accounting is a new term, which has been developing both at so called macrolevel, i.e. the level of national accounts, and at so called microlevel, i.e. the level of business accounting. In both the cases it means basically a method how to **monitor effects, which financial flows, related to activities affecting the environment, exert on a certain system**. The environmental accounting was created, in both the cases, due to the impulse of growing criticism to incapability of the appropriate accounting system to capture and evaluate such effects completely. The criticism began and so roots of the formation of both the types of environmental accounting are dated back to the second half of 1970s.

1.2 Environmental Accounting at Macrolevel

The major task of environmental accounting at macrolevel is to create so called green national accounts, i.e. accounts, which shall serve as the basis for potential assessment of financial impacts related to environmental issues from the national economy point of view, namely those related to exploitation of natural resources, waste generation, and other activities affecting quality of environmental compartments. Then on the basis of the green national accounts net green national product or other parameters showing overall financial side of activities related to environmental issues.

The need to elucidate the novel concept of development and to establish methodology of its evaluation and implementation has been repeatedly accentuated at many international conferences and meetings. At the beginning of 1980s the World Bank and the United Nations Environmental Programme (UNEP) started to deal with the issues in a very intensive way. After many different proposals how ecological factor should be incorporated into the system of national accounts, finally it was decided that appropriate solution should be sought outside the basic framework of accounting (Bartelmus 1992). There was the term of **System for Integrated Environmental and Economic Accounting** (SEEA) defined, and in 1993 within the revision of the system of national accounts a new accounting category, so called **satellite accounts**, was introduced. Then the System for Integrated Environmental and Economic Accounting became one of such satellite accounts.

Specific feature and advantage of the satellite accounts consists in the fact they enable to capture and acquire information on phenomena effecting more or less every sector of national economy. They enable the core framework of the system of national accounts to be expanded by further additional indicators and to make links in between phenomena characterised by data in physical units and monetary expressed quantities of the accounting system (Ritschelová 2000).

The development of environmental accounting at macrolevel is not carried out merely by national and international institution focused on statistics as, for example, EUROSTAT (Statistical Office of the European Communities), yet also such institutions as EEC (European Economic Chamber), OECD (Organisation for Economic Co-Operation and Development),

and others. There were even specifically focused working groups created within the international co-operation as, for example, London Group in 1994 and Nairobi Group in 1995.

The Czech Republic participated in pilot projects, which dealt with the application of so called of **National Accounts Matrix including Environmental Accounts** known under the acronym NAMEA, which was proposed by the Statistics Netherlands (Centraal Bureau voor de Statistiek). NAMEA represents one of the methods how data expressed in physical units may be compared to data expressed in monetary units. Every economic activity, every industry have allocated emissions of respective pollutants while these emissions are grouped according to environmental problems they cause. Then applying NAMEA one may find what are the shares industry and households contribute to such problems as eutrophication, greenhouse effect, ozone layer depletion, and waste generation. Contributions of respective entities may be then compared to their contributions to the formation of net domestic product, to exports, employment, etc. (Ritschelová et al. 2000).

2.2 Environmental Accounting at Microlevel

One of the first impulses, which led to the need to show costs and benefits, which activities related to environmental protection bring to a business, come from the UN activities that is from the activities of the Commission for Multinational Companies. In 1975 the Commission had the task to compare accountings of multinational companies also in terms of environmental costs (Ruffing 1999). Because of the deficiencies the Commission discovered in the course of its work, at the same year **the Intergovernmental Working Group of Experts on International Standards of Accounting and Reporting (ISAR)** was established. Since 1989 this group, which has the task to harmonise accounting standards and reporting, has been intensively working on environmental accounting at business level. In 1998 it published so called **Declaration** in approx. ten language versions, which has the purpose to unify procedures employed in financial environmental accounting at business level. Besides definitions of fundamental terms the Declaration also includes methods of reporting of environmental costs and environmental obligations including their publication. Here environmental financial accounting is defined as follows:

the accounting, which deals with issues of accounting and reporting of those transactions and events, which environmental effects have influence or may have influence on financial positions of the business.

2 Environmental Policy and Its Instruments

Originally, environmental policy was defined as follows:

purposeful activities of the executive (government, public authorities) forming a set of very diverse measures, which shall influence the public behaviour for the purpose to mitigate adverse effects exerted on the environment.

At present this definition has not, however, been conveying well the environmental policy. Over time it has appeared more and more clear that the preservation of healthy environment may not be provided by mere activities of government institutions and public authorities yet, besides these, a widely based co-ordinated activities of very varied social entities, not just non-governmental environmental organisations but also production companies, trade and financial organisations, and many other organisations, meaning not at sole national level yet also at local, regional, and international ones. This feature typical to the environmental policy, has led to the situation environmental policy has gradually lost the

position of an activity of mere political system and became more and more a result of activities of the whole social system. It is obvious today that environmental policy may not be just policy of single ministry, but shall be a general policy (Mežřícký 1995) or in other words multi-ministry policy. The policy may be defined as follows:

widely co-ordinated activities of various institutions (first of all government authorities, public and local authorities, non-governmental organisations, production companies, trade institutions) and citizens, focused on the reaching of balance of the human need satisfaction and nature reproductive capacity.

In order to achieve established objectives environmental policy uses very different formalised means, which are altogether named as the instruments of environmental policy. Originally the group contained merely those instruments, which were in use of government authorities. As the term of environmental policy has become spread the range of its instruments has been widened as well. In general, it may be stated that the instruments are very diverse in terms of their character, manner, and scope of effect, as well as from the view of the entity that applies them. The great diversity of instruments and, at the same time, their substantial mutual interconnected, as well as the continuous expansion of their range make the creation of their systematically categorised overview very hard. The proposal of a unified categorisation of the instruments (Remtová 2000) includes the primary task, which a given instrument shall provide in practise that is the purpose it was introduced for, selected as the major dividing criterion. From this point of view all instruments of environmental policy may be subdivided into three major groups: regulating instruments, information instruments, and educational instruments.

The regulating instruments shall impel an entity to perform the desired activity or action, i.e. an activity leading to reduced adverse environmental impacts. According to the degree of freedom, which the instrument gives to the entity, the regulating instruments may be further subdivided into direct control instruments (acts, for example), economic instruments (fees and levies, for example), and co-operation instruments, which are based on voluntary co-operation (for example, voluntary agreements, EMAS, etc.).

The role of information instruments is to provide information, which relates both to state of the environment and effects and activities affecting the environment and may influence and change its state. In order to make a better overview the information instruments may be subdivided into documenting instruments (descriptive instruments) and assessing instruments (analytical instruments). The documenting (descriptive) instruments are data describing the current state of the environment and its compartments, eventually on size of effects which a certain system exert on the environment. Values of ground-level concentrations of pollutants, emissions, amounts of waste generated, composition of waste water, etc. belong to this category. The term of assessing instruments means widely varied methods and procedures are employed for forecasting of effects, which the system assessed affects the environment under the circumstances given. This category includes, for example, assessment of product life cycle, hazard assessment, EIA, etc.

The last group is formed of educational instruments, which represent a certain synthesis of both the previous categories because their major role is to create, based on information provided, in the entity the responsible (autoregulating) approach to the environment. All purpose oriented training and educational instruments (courses, lectures, programmes, movies, videotapes, publications, etc.) belong to this group.

3 Position of Environmental Accounting within Environmental Policy

Within the instrument categories mentioned environmental accounting may be classified as an information and descriptive instrument because its major role is to provide information on what financial and environmental impacts are caused by activities related to the environmental issues.

The development of environmental accounting is closely related to the development of other information and descriptive instruments, and that is environmental reporting and indicators of the environmental profile of the entity given.

The importance of environmental accounting consists in the fact that it creates the basis for the assessment of environmental and financial (economic) effectiveness of a certain measure carried out, for example, on the use of regulating instruments. Environmental accounting is one of the important instruments for the introduction of the required eco-effectiveness, which is one of prerequisites of sustainable development.

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ECONOMIC BENEFITS OF RECYCLING RAILWAY BALLAST AND DEMOLITION WASTE

Aleš Suchánek

1. Introduction

1992 was a year in which the first feasible projects on recycling demolition waste into aggregates utilisable in building industry were launched. The new developing branch of waste processing was provided with a significant incentive in form of a self-financing technology which had gradually achieved its position on the market.

It is necessary to point out that the basic precondition for a radical change of the entire waste management was the adoption of the Act No. 238/1991 “on wastes”. At that time only less than 7% of waste material was re-used in production in the Czech Republic. The rest of the unprocessed waste – a large majority – was dumped in landfills without any treatment or benefit or, in worst cases, in black waste sites in the nature.

The precondition for successful functioning of the project of recycling building waste was to ensure high quality of input materials and to control the output materials. The technical quality had a direct impact on the economic quality, as following years showed.

1996 was a year in which the project on recycling demolition waste and building waste was adjusted to the reconstruction of the Czech Railways corridors. As well as the national legislation on wastes including implementing municipal regulations, the Czech Railways created technical and quality conditions for recycled ballast and grit ballast. Recycling technologies became qualitatively better and following exactly defined phases were involved in the process :

- *receiving waste or input material*

The input material must be of one, if possible, the same category of specific features (railway ballast, concrete waste, asphalt waste, mixed brick waste etc.).

- *sorting input material*

removing soil and dust by means of sieve machines

- *crushing*

The sorted input material is crushed in a crusher into fractions with grains of 0-120 mm.

- *sorting*

The presorted material is sorted further on sieve machines into required fractions and by means of magnetic separator iron and iron metals are separated.

- *dispatching*

A quality certificate of the features of the material is provided for the sorted fractions. In order to meet the required optimum compaction, the material is moisturized.

2. Recycling demolition waste

It is not necessary to go into a detailed discussion about environmental aspects of recycling demolition waste. Clearly, it enables to save raw materials and space in landfills intended for fast filling for unrecyclable waste in the future.

A recycling project is undoubtedly in competition with economic interests of the waste and mining lobby. It is possible to resist their pressure and to enforce the project in two ways:

through favourable economic approach towards the consumers

and by means of state coercive instruments – act on waste and municipal regulations. In this respect, we have to appreciate the helpful approach of the municipal council in Brno which in 1992 adopted the first regulation on the obligations of investors to ensure disposal of demolition waste and on waste supplies into recycling systems.

DUFONEV s.r.o. has been the first and the largest recycling company for building waste so far in Brno to succeed. The volume of demolition waste recycled by this company is higher than 100.000 tons per year. They produce and supply recycled material of high quality in compliance with the company's own standard. This standard is related to the appropriate ČSN in the area of traffic building and to the ČSN of building unions.

In the course of later years, new companies of this kind were founded in the Czech Republic. In 1995, the companies established the Association for Development of Recycling Building Materials in the Czech Republic (ARSM) which is a part of the international federation F.I.R. (Federation International du Recyclate) with its seat in the Netherlands. The Association supports the development of its members and fights intensely against fraudulent recycling companies which instead of recycling simply deposit the waste on landfills without any registering and without paying any fees to the state.

3. Recycling gravel from railway bedding

Currently, the Czech Railways administer and operate 9 300 km of railways - 7 400 km of one-rail-railways and 1 900 km of two-rail-railways or railways with more than two rails. We can say that 99% of the railways are classical iron top constructions with a railway grate placed on a ballast bed. We can assess by approximate calculation that in the railways of the Czech Railways there are 23 million m³ of natural crushed aggregate with fractions of mainly 32-63mm.

The problem of using old gravel when reconstructing railway lines was solved in 1995 when "General technical conditions for ballast in a railway ballast bed" were developed. The Czech Railways declared for the first time the quality of recycled gravel for reuse in a railway bed for the speed of 160km/h. The technicians dealing with recycling were asked to develop a new technology for recycling railway ballast and to meet the quality requirement of the investor for the recycled ballast (32-63 mm).

It was DUFONEV s.r.o. again which in 1996 – together with ŽS a.s.- founded their subsidiary ŽSD s.r.o.. This new company deals with recycling railway ballast. ŽSD s.r.o. bought a recycling line similar to the line of DUFONEV, however a mobile one. The line was modified in accordance with the company's patent application.

The first construction site where recycling was used in May 1996 was a railway corridor section Brno – Skalice nad Svitavou. Since then recycling has been used in all other construction sites of corridor sections. Modified recycled fraction 0-32 mm was further used in the foundation layers of a railway ballast bed. The particular phases of recycling stabilized

and were modified according to the performance timetable of the building maker. The mobile machine systems proved to be useful, for they process around 1 000 tons of material a day and can be moved to the recycling bases which are built along the construction site of the corridor and in which 10 000 to 25 000 tons of material are processed. The organization of work when mining old railway ballast and laying the recycled material has improved in the course of time and a special railway technique of continuous mining and laying has been developed and used.

A part of the technological process of recycling is repeated checking of the contents of pollutants of mainly oil origin. The regulations for recycling railway ballast do not allow using contaminated ballast. Such ballast can be found in places where locomotives were changed and placed and where oil lubricants were used or the oil dropped from the locomotives regularly.

Currently, two or three recycling lines are in operation in the construction sites during the whole day.

The following table shows annual performance in producing recycled material in the Czech Republic used for reconstruction of Czech Railways corridors:

Fraction / year	1996	1997	1998	1999	2000	total	share
0-32 mm	42 330 t	82 057 t	188 247 t	131 186 t	299 789 t	743 609 t	56,6 %
32-63 mm	37 208 t	67 397 t	93 027 t	78 561 t	40 511 t	316 704 t	24,1 %
undersize	17 188 t	24 655 t	48 633 t	68 466 t	94 101 t	253 043 t	19,3 %
Total recycled material	96 726 t	174 109 t	329 907 t	278 213 t	434 401 t	1 313 356 t	100,0 %

80% of this volume was recycled by ŽSD s.r.o.

4. Economic aspects of recycling

In 1998 the new Act No. 125/1997, „on wastes“, became effective, which meant that the long-term effort to improve waste disposal management in the Czech Republic has ended successfully. The new act replaced completely the Act No. 238/1991 and on January 1, 1998 all other laws, government regulations and decrees on waste disposal were repealed.

The consequence of this new legislation was that waste disposal became a new face. The basic advantage of the new legislation was the fact that waste producers were given a considerable degree of latitude to meet the basic objectives of the law, i.e. to decrease the waste volume gradually and, if waste is produced, to use more intensely other forms of waste disposal than dumping waste in landfill sites. This legal framework led to rapid development of recycling technologies for demolition waste and railway ballast in the Czech Republic and following legal and economic models of recycling were developed:

- waste disposal model

One company offers recyclable waste for disposal, i.e. for recycling to other company which has appropriate equipment and authorization. After recycling, the recycled material is offered for sale on the market with building materials. This model is used mainly for processing demolition waste. The waste, the recycled material is traded and his owner changes. The economic principle means that the competitive price for supplying the waste is lower than the price for disposal of the waste in a landfill site and the price of the produced recycled material is lower than corresponding natural material of comparable technical parameters. The total

revenue for waste processing and selling is the income. The processing technology is the cost. This model proved to be profitable.

- model of processing waste material of the investor

The investor rents a recycling technology and involves it in his entire technological process of building work. The owner of the material does not change in this case, no waste is produced and no decision on “getting rid of the movables” is made. This model is used in processing railway ballast by recycling. The investor indicates himself the place, time and the volume and qualitative conditions of the produced recycled material. In this case, the economic aspect of the process is based on a different scheme. The investor saves money for a waste deposition in a landfill and influences significantly his own transport expenses by choosing the recycling area. The recycling technology consists of mobile recycling lines which are moved to the place where the material is stored. The price for processing is similar to the price in a mine, for the lines include similar machines – sorters and crushers. Another important benefit for the investor is the flexible supply of enough material, in a mine there may be little material on stock. By combining recycled material and material produced from natural aggregate it is possible to cover the entire volume of material needed for building a corridor. Statistic calculations show that it is possible to save 100 to 200 CZK per 1 ton of recycled material used instead of new crushed gravel. The assessment for the total sum of savings in construction sites of Czech Railways corridors is 100 to 250 million CZK. This sum was saved by the investor, since he was so far-seeing to include the recycling technology of railway gravel into the competition conditions of tenders of the particular construction sites. This model is less profitable than the previous one, however it is feasible.

5. Conclusion

The recycling technology for demolition waste and ballast became a commonly used technology. Not little volume of potential waste goes back to the building process and its favourable impact on the environment is undisputed. The economic effect, depending on the purity of the inputs and on technological discipline, is high enough to enable these technologies to be self-financing on the market.

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INTEGRATED PRODUCT POLICY

Dagmar Sucharovová

Solutions and Contexts

A good quality of life requires a healthy environment, which is essential for long-term prosperity and a good quality of life. People in Europe, and on other continents, too, demand a high level of environmental protection. Economic development and efforts to raise people's welfare put pressure to bear on the ability of the planet to meet the increasing demand for natural resources and its capacity to cope with pollution. Strict standards in the area of the environment are simultaneously the motor force of innovation and entrepreneurial opportunities. Mankind must therefore strive for such economic growth that does not automatically impair the environment. Entrepreneurial activities must be friendlier to the environment. As a result, lower inputs will be needed for the production of the same or larger quantities of products, so that there will be fewer wastes and the consumption patterns will be more sustainable.

Until now, the aim of the State environmental policy in the Czech Republic has been to introduce into practice a number of new measures directly in the area of environmental protection, but also by applying environmental aspects in other sectoral policies. Today it can be said that although much progress has been made by drastically reducing pollution, especially in industry, some problems still persist and the environment will continue to worsen, unless:

- sufficient progress is made in implementing environmental legislation;
- practical activities and environmental protection are improved and integrated in economic and social policy putting pressure to bear on the environment;
- the parties involved and the citizens themselves assume greater responsibility in efforts to ensure environmental protection;
- measures are taken to solve serious and persisting environmental problems and newly arising difficulties.

In January 2001, the Government of the Czech Republic, by its resolution No. 38, approved a new State Environmental Policy, which set out the main environmental priorities and aims for the next five years. To attain the aims of the environmental policy, or more specifically, to prevent the further pollution of the environment and to improve the present condition and quality of the environment, an innovative approach must be applied in addition to conventional methods, and new ways must be sought to attain these ambitious, but inevitable aims.

A new trend began to develop in the 1980's, in addition to the conventional ways of ensuring the quality of the environment through formulating legal norms and regulations and the control of their observance, using new tools for improving environmental protection, mainly voluntary instruments, such as ecolabelling, cleaner production, environmental management systems, assessing the life cycle of products, voluntary agreements and other means.

Closer co-operation between environmental experts could be observed in the past few years. Very important is co-operation with the market aimed at stimulating the interests of the economic sphere and consumers, which can help significantly towards ecologically more sustainable production and consumption patterns. The entrepreneurial sphere should not be merely penalized for its neglect; there should also be systems to reward good performance. Consumers need useful information that will enable them to choose products which are friendly to the environment, thus influencing market trends in an ecologically more friendly direction. Subsidies granted from public means should support environmentally friendly technologies. The economic sphere must be encouraged to innovate, for example, by taking opportunities provided by the use, development and promotion of clean technologies.

Every day *people* make decisions which have a direct or indirect impact on the environment. Better quality and easily available information about the environment and about practical matters help formulate their stands, thus influencing their decision-making. All this in brief is the content of the Integrated Product Policy now being prepared, which is one of the tasks of the State Environmental Policy.

Basic Ideas Underlying the Integrated Product Policy:

Products and services reflect the wealth of society, the living standard, in a broader sense the quality of life. Consumer society, however, also has a negative effect on the environment. Exploitation of non-renewable natural resources, damaging the environment with industrial emissions and the use of products, the loss of sensitive ecosystems, the loss of a good-quality environment in general constitute serious risks for man, which he must face up to and to which he must find solutions. Sustainable development sets out general aims and anticipates the minimization and prevention of those risks, and is therefore one of the widely accepted aims not only in the Czech Republic, but also elsewhere in the world.

Integrated Product Policy (IPP), defined by the Green Paper of the European Commission, represents a new dimension of environmental policy relating to products and product systems, with the aim of attaining a sustainable development. IPP takes into account the latest information about the impact of production and products on the environment and is in keeping with the policy-making process on the international level, especially in the European Union. Our approach is based on the draft Green Paper of the European Commission and deals with the basic aspects of IPP.

IPP is arising from the need to find a solution to the abysmal difference between the price of the product which the consumer pays on the market and the costs which the life cycle of the product in reality incurs in the entire society on different levels. The hidden costs which society pays in the form of a damaged environment do not represent a direct feedback either for the manufacturer or the consumer, thus causing a neglected deformation of the market. Social costs (cost of health care necessitated by air pollution, noise nuisance, etc.) are rising disproportionately without sending out corresponding price signals. A product taking advantage of this fact thus enjoys unjustified benefits in comparison with a product which, due to its *less damaging impact on the environment in the course of its life cycle*, does not burden society with excessive costs.

Diagram of the life cycle of the product

IPP does not make it its aim to internalize negative environmental externalities (incorporating the costs of environmental damage in the economic system which has caused the damage) by means of environment assessment methods. This would not bring about results which would be widely, effectively, simply and universally applicable. On the contrary, IPP has set itself the ambitious aim of creating systems that will do without the external assessment of the environment. Price signals can be influenced also by other means and instruments, whereby the same aim can be achieved, but at lower transaction and administration costs (costs incurred in the administration and operation of systems adjusting price signals). With regard to the existing systems using correct price signals it can be said that these systems and their accurate elaboration have borne fruit. The internalization of externalities is no longer a theoretical concept and it can be successfully transferred into practice.

IPP should be used to ensure equal conditions on the market by economically stimulating better solutions, while putting worse systems at a disadvantage. Charges and advance systems pour no additional income into State funds. With the suitable choice of IPP instruments the charges paid by the system participants will be declining.

In practice this will involve primarily product systems based on physical products, but it may also apply to the provision of services, such as transport. The valuation of freight costs on an equal footing is also featured in the Green Paper of the European Commission dealing with the just and effective valuation in transport.

In many of its documents and statements and in the lectures of its representatives, the European Commission has often declared a shift in the character of environmental policy. Regulatory and administrative instruments, which are not sufficiently flexible, should be supplemented or substituted by instruments using market principles. If this solution is to

succeed, corresponding price signals must be found that will respect the priorities of environmental policy.

What Is Integrated Product Policy?

Integrated Product Policy (IPP) forms the framework for the prevention of pollution arising during the entire life cycle of the product. The purpose of Integrated Product Policy is to supplement existing environmental concepts with the use of a wide range of instruments on different levels, both in the framework of the law and by stimulating the specific activities of interested parties influencing product systems (voluntary instruments).

Integrated Product Policy is not a separate policy, but it serves as an umbrella for **partial activities having a common aim – to project the principles of sustainable development into the entire life cycle of products**. In this respect, sustainable development is seen primarily as a goal. It predetermines the use of instruments making it possible to minimize the influence of human activity on the environment, without restricting the growth of society in all its forms (economic, social). Sustainable development does not envisage the minimization of consumption as a phenomenon of modern society, but it anticipates the satisfaction of consumers' needs in a way which is friendlier to the environment. In this connection therefore we have in mind a change in the quality of consumption, and not the minimization of consumption as such.

In the European Union and in the Czech Republic, too, work is in progress to develop IPP in greater detail. In some member countries, certain steps in the research of potential implications and economic impacts have already been taken. As part of the effort for the integration of the Czech Republic in the European Union preparations will have to be made to provide administrative, economic and information instruments that will make it possible to apply in practice the principles of the Green Paper of the European Commission. Although this document is only a material putting forth the main ideas, it can be expected that its essential principles will be projected into the preparation of binding documents of European law. In view of the fact that this is a very complex problem, work in this area in the Czech Republic must begin as soon as possible.

Principles of Integrated Product Policy

IPP principles cover a wide range of activities linked with the product systems. Some principles of product policy have already been incorporated in instruments included in IPP (e.g. the ecological labelling of products system).

The following are the main IPP principles:

- **Creation of administration instruments** that will prevent the launching of products whose production or operation disproportionately burdens the environment in comparison with other such products.
- **Creation of information instruments** that will inform manufacturers, consumers and other interested parties about the environmental effectiveness of product systems (information and indicators showing how the particular product systems influence the environment, qualitatively and quantitatively), thus making possible a qualified choice by the consumer and enabling institutions to provide products with a better environmental impact. Some activities have already been carried out in this field, see the resolution of the Government of the Czech Republic of 19 June 2000

on the proposal to support the sale and use of ecologically friendly products, or the Ecologically Friendly Product Programme.

- **Creation of economic instruments** that will make possible the fixing of prices to reflect the social costs of product systems (costs invoked by the product system, but which are not incorporated in its price – e.g. the cost of eliminating and minimizing, directly or indirectly, damage to the environment. This responsibility must therefore be enlarged to include the consumer. Also responsible for the damage, besides the consumer, is, for example, the regulatory body (the State), as it creates legislation setting out minimum environmental effectiveness of the product system, thus defining the minimum standard. Standardization institutions creating norms and standards respected by the commercial sector are also responsible for the damage, in addition to these interested parties.

Usually, the basis for assessing responsibility and proposing solutions to problems in the particular product sector is the so-called functional unit representing a unit of the service offered by the particular product system. For example, the functional unit of wrappings may be 1 kg or 1 l of the packed product; in the case of detergents the functional unit may be 1 kg of washed linen.

The Aims of Integrated Product Policy

- **To integrate environmental aspects in the production chain** – to improve the environmental profile of products from the point of view of the life cycle of the product (longer service life, lower material and energy inputs, suitable materials, use of recycled materials, proportion of recyclable materials in the product, etc.).
- **To stimulate innovative trends** (to place new products and services on the market that will meet consumers' needs, causing minimum burden to the environment, while initiating the economic growth of society).
- **To adjust economic instruments and price mechanisms** – to set right the real prices of products so as to incorporate social costs (to internalize negative externalities in the prices of product systems).
- **To broaden the responsibility of the manufacturer for the products and services** he has placed on the market (e.g. to introduce the duty of taking back products after the expiry of their service life in the sense of EU directives concerning batteries, used oils, wrappings, scrapped cars, etc.).
- **To inform all interested parties about their responsibility** (State administration bodies, the commercial and public sector, experts and the general public, information panels highlighting groups of products, environmental labelling and other IPP instruments, etc.).
- **To underline the environmental profile of products when supplying State authorities and institutions, as well as small consumers, thus stimulating the growth of the labelled products market** (modification of existing purchasing habits).
- **To promote the environmental labelling of products** (including all three systems of environmental labelling – ISO I., ISO II., ISO III.).

Current IPP Activities in the Czech Republic

Although the creation of IPP instruments has only just begun, the first activities aimed at their use are already in progress in the Czech Republic. These activities form the basis for the preparation and introduction of concrete instruments and measures pursuing the aims of Integrated Product Policy.

The realization of IPP aims, however, is still rather fragmented. There is no system that will prepare systematically the conditions for the creation of instruments complementing each other. A basis for such co-operation of different parties should be provided by a working group comprised of representatives of State administration bodies, the private sector (industrial firms and professional associations) and the public sector represented by non-governmental organizations concerned with environmental protection and the protection of consumers.

The following initiatives have already been launched on the basis of IPP or have started independently and are in agreement with its aims:

Government Resolution No. 720

Government Resolution No. 720 in support of the sale and use of ecologically friendly products was adopted on 19 July 2000. This resolution recommends Government members, heads of other central bodies of State administration and district offices that in organizations managed by them one of the criteria in choosing products should be their environmental profile – e.g. the Ecologically Friendly Product label. At the same time it recommends managerial workers to give priority to the direct purchase of goods and products with this label.

This resolution is an initiative of the Government which, aware of its responsibility for the public provision of products and services recommends giving priority to products which represent a lesser burden for the environment. This activity should be further developed by means of instruments influencing the public provision of products, which are friendlier to the environment.

The ministries already implement this Government resolution and keep records of the purchases of ecologically friendly products. A list of these products is also contained in the Report on the results of the campaign to promote the sale and use of ecologically friendly products. The Report underlines, among other things, the importance of the public provision of these products as one of the instruments stimulating demand for ecologically friendly products, thus creating better conditions for their development and placing on the market.

Co-operation with Industrial Associations

Other activities reflecting co-operation in promoting ecologically friendly products and services is the Action Plan to specify tasks ensuing from the Agreement on Co-operation between the Ministry of the Environment, the Confederation of Industry of the Czech Republic and the Czech Entrepreneurial Council for Sustainable Development in 2000-2002. This Action Plan contains a commitment of the Confederation of Industry to ensure that the industrial sphere is duly informed about the introduction and use of voluntary preventive instruments supplementing regulatory instruments in practice, e.g. the Ecologically Friendly Product label and other voluntary instruments (cleaner production, the Life Cycle Assessment, etc.). The agreement contains the **commitment to co-operate for the purpose**

of supplementing the “orders and bans“ regulation with economic and voluntary instruments.

The agreement on co-operation between the Ministry of the Environment and the Confederation of Industry of the Czech Republic does not specify the procedures under the Integrated Product Policy arrangements, but forms the framework for future initiatives that will specify the general IPP principles.

The Ecological Labelling System in the Czech Republic

The Czech Republic has introduced the ecological labelling system and makes it possible for manufacturers to join the system. In case the product meets the requirements of the directive concerning the particular product group, the label will be awarded to the manufacturer temporarily following the necessary procedure. Activities in the field of ecological labelling are ensured by the Ecologically Friendly Products Agency.

The Agency ensures the development of the National Programme, among other things, in choosing new product categories and lays down the criteria for the assessment of products and their processing in the form of new directives setting out the requirements for the award of the Ecologically Friendly Product (EŠV) label. It carries out all activities in accordance with EU ecolabelling regulations and the approximation strategy in the area of the environment.

The Energy Management Act, 406/2000, of 25 October 2000

A contribution towards meeting the IPP targets is the act setting out the principles of labelling energy consumers. This act lays down the duty to provide energy consuming devices being placed on the market with energy labels and technical data and to ensure their minimum energy effectiveness.

This regulation on the one hand serves the purpose of informing the customer about the energy intensiveness of the product, while on the other hand it determines the minimum standard (effectiveness) of products which may be placed on the market. The product must be provided with a label stating its energy effectiveness (in degrees from A to F).

Implementing regulations to the Act are currently being prepared.

Integrated Product Policy Instruments

Integrated Introduction of IPP Instruments

In the first place, Integrated Product Policy should serve as a framework for the creation of new legislation that will specify concrete IPP instruments, both market and administrative. The legislation must enable the linkage to other necessary activities, such as the creation of technical standards.

Sometimes we can hear the objections of producers against some IPP instruments (e.g. deformation of the market, administrative difficulties in environmental labelling of products, fears of manufacturers that the responsibility for products will be transferred to manufacturers). The State administration, too, fears an inadequate ecoeffectiveness of the ecolabelling system, conflicts within the existing tax and fee systems, etc.

Co-operation of Interested Parties in Pursuing IPP

Due to its character, which differs from the other so-called process-oriented policies, Integrated Product Policy requires a differentiated approach in its practical application. To ensure the application of IPP aims and instruments, it is necessary to create a functional network of partners that will be in a position to take effective measures in introducing IPP in different sectors. IPP must be transparent, open, with an emphasis on the market principles and voluntary instruments.

One of the basic principles of IPP and its instruments is the principle of shared responsibility for the damage caused to the environment by product systems. The responsibility for this damage is borne jointly by all the parties involved in the particular product system.

State administration is a key partner in the process of improving the environmental profile of products. It creates a legislative environment guaranteeing the “minimum standard“ of products, providing the basic economic and administrative stimuli and rules. The key role of State administration in the field of IPP rests in the creation of a legislative framework, in its co-coordinating role and the creation of instruments in support of ecologically friendly product systems.

Another role of State administration is derived from its purchasing power. State administration is one of the main consumers (in EU member states often exceeding 15% of the market); consequently, the choice of suppliers for the State administration is a suitable stimulating element on the market. The behaviour of State administration may also serve as a good example for other consumers.

Producers satisfying the needs of consumers are co-responsible for the quality of products and their impact on the environment. In the process of improving the environmental profile of products, producers should be stimulated so as to ensure that the information provided by the State administration and other interested parties may serve in their internal decision-making process in favour of the development of ecologically friendly solutions.

Producers should take advantage of all suitable environmental labelling systems (ISO I-III) and provide consumers with relevant information about the product (its material composition, energy intensiveness during production and energy consumption when used).

The producers' activities should lead to the minimization of the impact of the product on the environment, with the aim of attaining dematerialization. Producers should be motivated in this system and together with the other interested parties develop new innovated product solutions.

Consumers, together with producers, are responsible for the impact of products on the environment. They should be better informed about products and the information should be absolutely transparent. Better and more reliable information in a comprehensive form should enable consumers to make a better choice in favour of products friendly to the environment.

Non-governmental organizations must be invited to participate in the dialogue, so as to become real partners in pinpointing the problems and the development of practical solutions aimed at reducing the ecological impacts of products on the environment. In this area, non-governmental organizations in the environmental sector are not the only ones to be active; important activities are also pursued by other non-governmental organizations, such as those concerned with consumer protection. As a rule, non-governmental organizations represent the non-organized public.

Towns and regions form an indivisible part of groups solving environmental problems on the local and regional levels. Towns play an important role in local refuse disposal systems, and in future, in addition, they will play an important role, for example, in implementing EU directives concerning packings. IPP will have an important influence on their present and future activities. Towns and regions should therefore participate in decision-making as regards the creation and use of IPP instruments.

Institutions concerned with standardization are the main actors in the standard creation process. The creation of standards, which are widely and voluntarily used by the production and non-production sphere, influences significantly the environment, as very often it defines the “obligatory“ character of products. The environmental impact of new standards must be influenced already in the process of their creation so as to reflect a certain minimum standard of environmental protection. In the process of standard creation, these institutions must enable all other interested parties to participate actively.

Educational institutions play an irreplaceable role in the process. It is especially necessary to arouse the interest of institutions concerned with the education of designers, because they can influence the impacts on the environment already “from the drawing board“ – when they design the products and make use of existing product systems.

Prerequisites of the Future Development of IPP

In future, the development of IPP will mean primarily the creation of new instruments and mechanisms and their integration in existing legislation. This will involve especially the creation of a legal framework for the introduction of market instruments, the preparation of a commented version of the laws and regulations, the spreading of information about them and ensuring interactive communication between the parties, especially between the producers and consumers. All the interested parties which may be affected by the instrument will have to co-operate in the creation of the new instruments. A condition is the partnership approach of the commercial and public sectors and agreement on the common aims to be attained.

New instruments and systems will have to be created so as to support mechanisms incorporating environmental costs in the prices of products. This can be achieved, for example, in the form of different returnable and non-returnable fee systems. Economic instruments thus would take into account the costs incurred in damaging the environment and would stimulate producers to go over to ecologically more friendly production processes and product designs.

Another aim of IPP is to stimulate innovations as a way of contributing towards economic development. IPP is taking advantage of a number of successful examples of dematerialization of products and services, which have already been placed on the market by the commercial sector for their competitive advantages. In developing IPP instruments other political documents (e.g. the Green Papers of the European Commission on Innovations) devoted to innovation will have to be taken into consideration, so as to avoid any contradictions.

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ECONOMY VERSUS ECOLOGY

Vladimír Surový

The relationship between economy and ecology may be analyzed from different points of view. Using the title “economy versus ecology” for this article, the author intends to emphasize the impact of economic development on the environment. The current level of economic development was reached, into a large extent, at the expense of the environment.

The system of the environment consists of natural aspects and aspects created by human beings. People try to explain the origin of the natural factors and to understand the nature of their principles. The natural environment as a part of the environment on the Earth is called biosphere. In the biosphere, solar energy helps to change mineral substances into organic substances. During this process, organic substances which were consumed by living organisms fall apart. In this way the process of continuous circling of the substance in three stages takes place. The first stage is the process of creating organic substances. This is made by green plants. In the second stage, organic substances created by green plants are consumed or processed by living organisms. The third stage is based on the decay of created and utilized organic substances.

The life of human beings therefore depends on the biosphere resources. These are: soil, water, air, solar energy, minerals, plants and animals. Today, the question which natural resources are exhaustible is discussed very often. The classification of the resources into exhaustible and unexhaustible is losing its sense. We have to face the shortage of so called unexhaustible resources like water. This may be observed in places of high economic level. That is why the author uses the contrast economy – ecology.

In this respect, it is necessary to analyze also that part of the environment which is built by people on purpose. The working environment which is substantially artificial like a factory, for example. The natural resources adjusted for the needs of a working environment are for example agricultural soil, regulated rivers etc. Living environment has also a substantial artificial character. We have to look at the diversity of the environment for living depending on the economic level of the region. High economic level leads to efforts to copy the natural environment in the living environment. Working, living and other kinds of environment like social or leisure time environment create together an artificial part of the environment in form of cities, housing estates and so on.

These two parts of the environment – the natural and the artificial environment – are influenced by economic processes which need to be examined also from the ecological point of view. Current state of economic development at the expense of ecological criteria becomes unacceptable for the future. It is necessary to look for models of harmonization of economic development and ecological aspects.

In the past, two or three centuries ago, new technologies were tested and evaluated from two points of view only:

1. In what extent did they contribute to economic growth?
2. In what extent did they contribute to military power?

Environmental aspects do not contradict economic development, but support the harmonization of the economic development and the ecological aspect. Besides, only advanced economy may provide means for solving ecological problems. The general considerations about the ecological aspects of economic development stated above need to be specified in microeconomic environment models, i.e. management of an enterprise. The existing market approach which has not involved the ecological aspect preferred the financial effect of the final product in the management of the reproduction process. In such environment, selling the final product was the beginning of the management process and the most important aspect in all phases of the management process. The factors of the reproduction process and their financing were adjusted to it. If we look at the expenses connected with creation and protection of the environment as at reproduction process expenses, we will find out that for example many machines which have been considered productive so far are actually unproductive. There is a need to observe the expenses for those activities which would not be performed, if there were not a new partial objective – environmental protection.

Close observing of the expenses helps to specify the ecological problems and the most effective instrument for their recording is an accounting information system. This approach requires that the profit maximization involves the minimization of standard expenses as well as ecological expenses. The ecological expenses have to be differentiated at the beginning between internal and external expenses. The internal expenses like expenses for waste disposal, the expenses for repairs, ecological education etc. are stronger and more apparent for the enterprise. A completely new group of expenses are external environmental expenses. These expenses depend on the impacts on the environment caused by the enterprise. In the past, it was this group of expenses which was completely ignored and the enterprise paid no attention to it, as if these expenses were of no importance to it. Neither did the company care of these expenses, so no activities for protecting the environment were performed. The employees of the enterprise took these ecological expenses as those one can avoid. Currently, the management expenses cover only a minimum of environmental expenses like fees for water pollution, air pollution, soil pollution and waste disposal. In the future, ecological thinking will emphasize the importance of environmental expenses and they will become one of the most significant items. There is a question whether accounting information systems should record these expenses as one individual group or divide them as subitems under existing types and groups of expenses. Current legislative standards do not require recording environmental expenses. However, they are mentioned in tax regulations and are favoured a little in the deductible items of the income tax.

Dividing environmental expenses into internal and external expenses may be followed by differentiating them according to their possible connection to the bearers of expenses, the performance of the enterprise. By this we mean dividing them into direct and indirect. Direct expenses may be assigned to a specific final performance of the enterprise, in the ecological sense, to the kind of pollution or to a pollution prevention programme. Indirect environmental expenses are assigned to the expenses of units, because there is no direct causal relation. Internal ecological expenses are often direct expenses. External environmental expenses tend to occur outside the enterprise. As for the accounting point of view is concerned, they are usually counted as external expenses. In connection with environmental expenses, we may ask where the motivation for performing environmental activities arises. In this case, the motivation arises thanks to the activities of environmental protection institutions, non-governmental organizations or thanks to more favourable taxes. These external environmental expenses are often called “environmental losses” and involve damage compensations to others.

The above mentioned problems do not represent a complete description of environmental expenses in connection with ecological aspects of the process of running an enterprise. Because of limited space, the author cannot deal with detailed analyses of the ideas mentioned above.

An accounting system should record the entire reproduction process of an enterprise - the supply phase, the production phase and the sales phase. The attention in the production stage has to be paid mainly to the expenses. The market point of view emphasizes evaluating the sales phase. If we focus on the environmental aspect, the beginning of the management process is shifted to the expenses. It means that after a qualified assessment of expenses, including expenses for environmental measures, information for the management process in the area of final performances of the enterprise should be produced.

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ENVIRONMENTAL EXPENSES - TRANSPORT ORGANIZATIONS

Petr Škapa

Environmental expenses of an organization and their assessment are environmental protection instruments and are part of the eco-management systems EMS and EMAS. The most important precondition for working with environmental expenses is their identification. Including these expenses in overhead items does not enable the management to make qualified decisions on the environment which may be polluted by diverse activities of the organization.

The assessment of environmental expenses is an integral part of the accounting system of an organization and shows financial flows and data on environmental impacts of the management and economic system of the organization in financial units (expenses or revenues and payables of the organization are registered).

Environmental expenses may be characterized as costs connected with the activities of the organization (investments etc.) and other activities (waste disposal, reducing the amount of produced waste etc.) which aim at reducing the adverse impacts of the organization on the particular parts of the environment. Such expenses may be for example air pollution charges as well as expenses for remediation of an old landfill or a contaminated site.

An analysis of environmental expenses enables the organization to take such measures which lead to reducing operating costs as well as reducing the pollution. Such analysis focuses on:

- monitoring of flows of materials and energies and their impact on our environment
- financial representation of these flows,
- finding out critical points which are the largest polluting sources,
- looking for solutions and assessing them in terms of environmental and economic aspects,
- including monitoring of relevant items in the information system .

Monitoring of environmental expenses and their analysis lead to reducing expenses as well as to lower pollution. However, it is necessary to:

- a. create, involve and motivate an interdisciplinary team of employees,
- b. identify with the opinion that flows of materials and energies polluting the environment lead to losses, because the enterprise has to pay for them three times when
 - ◆ buying it,
 - ◆ processing it,
 - ◆ depositing it in the environment,
 - ◆ production waste or operating waste,
 - ◆ charges for emissions from stationary and mobile air pollution sources,

◆ after the expiry of their working life

- c. realize that a lot of work is needed for the project, that its preparation may last for several months and that the expected effect of the project may come in two or three years.

Environmental accounting also involves an information system of environmental expenses which should not only ensure high-quality monitoring of the expenses for the particular media of the environment, but also provide information which may be used for deciding on measures for reducing these expenses.

Apart from the environmental expenses, environmentally caused financial impacts on the assets of the company are monitored. These data influence for example the decisions on new technologies.

Environmental protection information may be characterized as data, statistical calculations and other quantity and quality data required by decision-making bodies (at the enterprise, organization, state administration level) for the assessment of the environmental situation and trends of environmental changes, for formulating and specifying environmental policy and for effective use of instruments for improving the quality of our environment.

There are complicated relations between ecological and other variables (observing valid legal regulations, development of the enterprise or organization, production development, economic aspects etc.) in the area of environmental protection.

Quality requirements for environmental information:

- correctness,
- availability,
- reliability,
- time limitation,
- possibility of making an analysis.

The risk of incorrect use of environmental information is high and correct interpretation requires specialists in many cases. Environmental information may be abused in business as well.

Information on the condition, development and influential factors of pollution (of the particular parts of the environment) is important for following activities:

- monitoring pollution trends and using such data for developing qualified prognoses of further development of an organization,
- specifying useful measures for assessment of pollution impacts on particular media of our environment (reduced use of primary resources, lower charges etc.)
- providing documents for implementing stimulative economic instruments (tax relief etc.)
- meeting legal regulations
- facilitating decision-making processes in terms of economic aspects of an enterprise or organization.

The Czech Railways have an information system in the area of the protection of particular parts of our environment based on the regulation SR 79 which is the basic regulation for collecting accounting information for the accounting system of the Czech

Railways. Analytical accounts enable a detailed segmentation of the expenses according to the needs of organizational as well as executive units of particular divisions and the General Directorate. These accounts are used by the controlling system of the organization and serve for processing of end calculations of the Czech Railways.

Basic structure for monitoring environmental expenses

1 Operating expenses of own environmental plants

for operating sewage treatment plants, catchpits, septic tanks, cesspits

for operating wells

for operating water treatment plants

for operating cleaning plants and plants for catching emissions from thermal air pollution sources

for operating plants for catching emissions from technological air pollution sources

for operating landfills

for operating landfills and/or waste collecting points

for operating waste incineration plants

for operating waste treatment plants and/or waste recycling plants

2 Charges

water levy and sewage levy (total)

surface water abstraction charges and groundwater abstraction charges and wastewater charges

air pollution charges for small thermal pollution sources

air pollution charges for medium-sized thermal pollution sources

air pollution charges for large thermal pollution sources

air pollution charges for small technological pollution sources

air pollution charges for medium-sized technological pollution sources

air pollution charges for large technological pollution sources

basic and risk charges for waste deposition in own landfills (Annex No. 3 to the Act No. 125/1997, on waste)

3 Sanitation expenses of contaminated sites

sanitation expenses of old landfills

sanitation expenses of new landfills with no permission (§ 3 (7) of the Act No.125/1997, on waste)

sanitation expenses of other contaminated sites

4 Waste disposal expenses

for waste of O category (Order of the Ministry of Environment No. 337/1997)

for waste of N category under stricter disposal regime (Order of the Ministry of Environment No.337/1997, Annex No. 5)

for waste of category N except for waste under stricter disposal regime

5 Sanitation expenses after accidents

accidents caused by organisational and/or executive units of the Czech Railways

accidents caused by other legal entity

culprit unknown

6 Sanctions – fines

in water management

in air pollution

in waste management

in nature, landscape and soil

in management of noise and/or vibrations

7 Other environmental expenses

physical and chemical waste analyses (in the sense of the Act No. 125/1997, on waste, and of implementing provisions to this Act)

physical and chemical analyses used for sanitation of old contaminated sites

authorized measurement of medium air pollution sources

authorized measurement of large air pollution sources

measurement and assessment of noise pollution level and/or pollution level of vibrations

eco-audit and/or supervisory monitoring carried out by an other organization

for creating a reserve for reclamation and sanitation of own landfills after finishing their operation (Order of the Ministry of Environment No. 340/1997)

for treatment of green areas

other unspecified expenses

It is not only important to register environmental expenses properly, but also to interpret correctly the results, especially the development of environmental expense of the organization. The actual assessment and analysis provide basic information on the internal environment of the organization and its relation to the external environment.

Other assessment elements are information and management methods which may focus on one of the following activities:

- planning,
- implementation,
- assessment,
- plan improvement.

The main objective of this management process is a consistent analysis of feedback, so that the organization may learn from its own mistakes.

Setting environmental indicators for the needs of the management of an organization is one part of the strategy. These indicators are necessary when implementing environmentally oriented management (EMS).

Environmental indicators are introduced in the organization for its decision-making processes. Important are mainly environmental profile indicators of the organization. Organizations may create such indicators individually according to their activities and local conditions. An example of such indicators is a basic set of indicators of environmental profile of an organization.

The indicators are useless, if they are not analysed and if the causes of pollution impacts on the particular media of our environment are not removed. It is advisable to use the indicators with regard to the production of the organization. If we consider transport organizations, following units may be considered as production units in a certain period of time:

- number of transported persons,
- pure weight of transported goods,
- number of (pure) kilometres with load.

The development of indicators should be analysed in time rows, which would show us how the organization contributes to the improvement of our environment. Other indicators may be added to the basic set of environmental indicators like charges, fees, sanctions etc.

Examples of results of monitoring and analyzing environmental expenses of the Czech Railways in 2000 are listed in following tables and one chart:

Operating expenses of own plants

1.10	Operating expenses	(thousand CZK)
1.11	sewage treatment plants, catchpits, septic tanks, cesspits	10 278
1.12	wells (water analyses, disinfection, repairs)	1 213
1.13	water treatment plants (operation, energy, chemicals, analyses, repairs)	691
1.14	cleaning plants and plants for catching emissions from thermal pollution sources	2,2
1.15	cleaning plants and plants for catching emissions from technological pollution sources	34
1.16	landfills	8
1.17	waste stores or waste collection places	408
1.18	waste incineration plants	0
1.19	waste treatment or recycling plants	0

Charges

1.20	charges	thousand CZK
1.21	water levy and sewage levy (total)	158 619
1.22	surface water abstraction charges, groundwater abstraction charges and wastewater charges	2 143
1.23	air pollution charges for small thermal pollution sources	3 939
1.24	air pollution charges for medium thermal pollution sources	755
1.25	air pollution charges for large thermal pollution sources	423
1.26	air pollution charges for small technological pollution sources	22
1.27	air pollution charges for medium technological pollution sources	15
1.28	air pollution charges for large technological pollution charges	0
1.29	basic and risk charges for waste deposition in own landfills (Annex No. 3 to the Act No. 125/1997, on waste)	61

Sanitation expenses of contaminated sites

1.30	sanitation expenses of contaminated sites	thousand CZK
1.31	sanitation expenses of old landfills	2 143
1.32	sanitation expenses of new landfills with no permission (§ 3, paragraph 7 of the Act No. 125/1997, on waste)	519
1.33	sanitation expenses of contaminated sites	185

Waste disposal expenses

1.40	waste disposal expenses	thousand CZK
1.41	for waste of O category	70 021
1.42	for waste of N category under stricter disposal regime (Order of the Ministry of Environment No. 337/1997, Annex 5)	367
1.43	for waste of N category except of waste under stricter disposal regime	13 280

Sanitation expenses after accidents or releases of harmful substances into the environment

1.50	sanitation expenses	thousand CZK
1.51	caused by organizational and executive units of the Czech Railways	35 313
1.52	caused by other entity	310
1.53	culprit unknown	0

Sanctions – fines

1.60	Fines in the area of	thousand CZK
1.61	water management	7
1.62	air pollution	105
1.63	waste management	39
1.64	nature and landscape	20
1.65	noise and/or vibrations	0

Other environmental expenses

1.70	Other expenses	thousand CZK
1.71	physical and chemical analyses of waste (Act No. 125/1997, on waste and implementing regulations to this Act)	222
1.72	physical and chemical analyses for sanitation of contaminated sites	58
1.73	authorized measurement of medium air pollution sources	5 662
1.74	authorized measurement of large air pollution sources	530
1.75	measurement and assessment of noise pollution level or pollution level of vibrations	11
1.76	eco-audit and/or supervisory monitoring by some other organization	266
1.77	creating a reserve for reclamation and treatment of own landfills and for their sanitation after finishing their operation (Order of the Ministry of Environment No. 340/1997)	42
1.78	other unspecified expenses	1 586

Investment and other (non-investment) expenses

Investment expenses – actions finished in 2000:	thousand CZK
in water management and water protection	16 510
for reducing energy (fuel) consumption and emissions	69 771
in waste management	68
Investment expenses – actions not finished in 2000:	
in water management and water protection	29 579
for reducing energy (fuel) consumption and emissions	25 988
in waste management	514
Other costs – actions finished in 2000	
in water management and water protection	2 976
for reducing energy (fuel) consumption and emissions	3 535
in waste management	41
in noise management, management of vibrations and other forms of physical radiation	24
Other expenses – actions not finished in 2000	
in water management and water protection	0
for reducing energy (fuel) consumption and emissions	876
in waste management	30
in noise management and management of vibrations and other forms of physical radiation	4

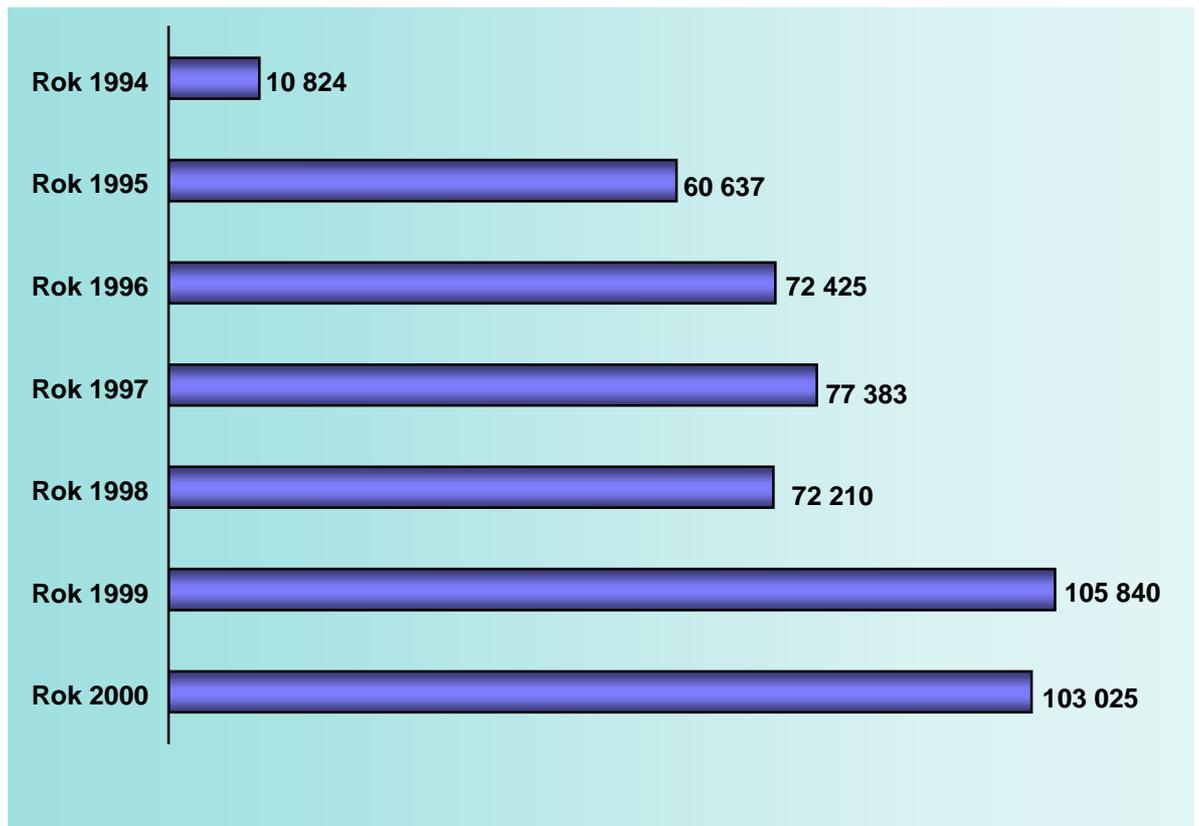
Based on analyses, following changes of heating medium or other measures were taken in 2000, which lead to emission reduction along with reduction of environmental charges.

heating medium – heavy heating oil	not used in the Czech Railways since 31.12.1999
using natural gas instead of light heating oil	2 heating plants (medium sources)
using natural gas instead of solid fuel	29 heating plants (medium sources)
using natural gas instead of solid fuel	148 heating plants (small sources)
using electric heating instead of solid fuel	11 sources (small sources)
replacing VSB boilers with CARBOROBOT boilers	4 heating plants (small sources)
modernization of heating technology	4 heating plants (medium sources)
replacing old technologies with new devices	3 2 joinery plants, 1 painting plant
modernization of the heating plant (for solid fuel)	1 1 heating plant (large source)

Expenses for treatment of green areas in 2000

parameter	year 2000	
	area (ha)	costs (thousand CZK)
unwanted vegetation control in ballast bed alongside railway lines		
chemical	2 084	12 418
mechanical	1 578	36 918
treatment (maintenance) of green areas and control of unwanted vegetation (mowing, felling, cutting etc.)		
on operating areas of the Czech Railways – grass	1 074	19 411
on operating areas of the Czech Railways – wood	557	27 623
on other areas of the Czech Railways – grass	397	5 758
on other areas of the Czech Railways – wood	17	897
Fines for		
felling (with no permission) and damaging wood		20
Green areas		
alongside roads	19 460	
others	845	
Amount of wood from felling or cutting	3 788 t	

Expenses for treatment of green areas in last seven years (thousands of CZK)



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INTERESTING ASPECTS OF IMPLEMENTING EMS IN ZNOVÍN ZNOJMO

Pavel Vajčner

Znovín Znojmo a.s. produces wines from grape vine and also sparkling wines and vermouths. As for its production volume, Znovín belongs to medium wine producers. The size of the company enables its management to focus on quality, to regulate the production and to introduce new interesting high quality products on the market. The annual gross wine production is 4 million l, 1,1 million l of vermouths, 100 thousand l of sparkling wine. The total turnover is approximately 300 million CZK. There are 100 employees in the company.

Knowing that if the company wants to succeed in the market economy, it must produce products of high quality, the management focused on clients. They defined the target groups of customers and offered their products to them. In the course of ten years, it has succeeded in addressing and maintaining quite a large number of clients. Znovín also organizes presentations and degustations for the club “Friends of Good Wines”.

In general, food production produces quite a large amount of waste water which is highly polluted with organic substances. Wine production is no exception. The most water is needed for washing bottles and washing and sanitation of technological equipment. In the first half of the 90s, this was a limiting factor for the performance and development of the company. Znovín worked together with the Centre of Cleaner Production, Prague, with an Austrian company STENUM GmbH, Graz, and the Austrian Government (financial sponsor of the project) on solving this problem. The cooperation enabled to solve the difficulties with waste water and with implementing and certifying an environmental management system in compliance with ISO 14001.

Znovín Znojmo a.s. was among the first companies which signed the International Declaration on Cleaner Production, adopted by our Government in the first half of 1998.

The company included the requirements of the Act No. 110/97 which stipulates that every food company must implement a system of critical points (HACCP – Hazard Analysis Critical Control Points) in its decision-making processes, work procedures and instructions. It means that the company analyses possibilities of producing products without harmful health effects, took preventive measures and extended its operating and output control.

During the implementation, the management of the company realized that it would be necessary to develop a homogenous framework and form for the systems. A decision was made that the platform for connecting the systems may be created by implementing quality management in accordance with ISO 9001 and by gradual including and interconnecting already existing systems. The main aim of this task is to mobilise and motivate the employees, to make the management of the company more transparent and effective, and to get new knowledge and experience.

We found out some interesting aspects during the implementation of these systems, analysing the activities and other tests and analyses. The first one is that the wine on the territory of our republic contains only trace contents of spraying agents for the vine. We monitored the content of metalaxyl (Ridomil in business language):

- Triadimerol (Bayleton)

- Asoxystrobin (Qvadrís)
- Iprodion (Rubigan)
- Triadimefon (Bayleton)
- Folpet (Folpan)
- Vincozolin (Ronilan)
- Penconazol (Topass)
- Deltamirin
- copper

We compared wines produced on a basis for which these substances were used. The result was that the contents of these substances in wines produced from local grapes were deep below the limits, 2 –10 times lower. In comparison with some world wines, our wines are better in this respect, because the content of these substances in some foreign wines is close to the limit.

Another interesting result was reached in “experiments” in which white wine was regularly served to people. We monitored the impact of white wine on human organism with regard to heart diseases. Since the results are unique, I would like to go into some details here.

The experiments were methodologically supervised and evaluated by Prof. MUDr. Milan Šamánek, DrSc. from the Cardiocentre of the Faculty Hospital in Prague Motol.

This study based on serving white wines, to be more precise Veltlínské zelené of the brand Dan Ermite, to fifty healthy men from Poděbrady was a unique research. After four weeks of daily consumption of 3,5 dl of Veltlínské zelené after supper, the amount of certain substances in blood (which are indicators of human health) has changed substantially. Consider following fantastic results:

A. (see the table below):

- substantial increase of HDL (harmless cholesterol) which protects against the development of arteriosclerosis
- substantial decrease of the fibrinogen level – a very favourable factor which decreases the danger of heart attack
- higher speed of esterification of HDL. Quicker esterification is a favourable factor which prevents from arteriosclerosis.

	total HDL – mmol/l	HDL free – mmol/l	Fibrinofen g/l	Esterification of HDL – cholesterol (% /hour)
before drinking	1,17	0,17	3,77	16,40
after drinking	1,25	0,20	3,35	17,96
statistical importance	highly substantial increase	highly substantial increase	clear decrease	statistically substantial increase

- B. Some other values which might signalize a negative impact of white wine on human body if they change were monitored. However, they did not change:

The amount of TC, LDL (harmful cholesterol) and triglycerides did not increase. Glycaemia as well as the value of the liver enzyme (ALT) did not show any liver damage. The blood pressure which is said to increase after drinking alcohol remained the same after drinking the wine and the diastolic pressure even decreased. The body mass index (BMI) decreased slightly as well.

- C. Here are the analytical values of Veltlínské zelené: alcohol 11,48 %, sugar 2,25 g/l, acids 6,30 g/l, SO₂ 67 mg/l, pH 3,59. White Moravian wine proved to be healthy for human organism in reasonable amounts. Men are recommended maximum 4 dl white wine a day, women 2 dl (the tolerance of women to alcohol is lower) – no more. So far only red wines have been supposed to have favourable effect on human health, but now we may say that Moravian white wines have the same favourable features as the red wines.

This result was one of those interesting and important outcomes which may accompany introducing and implementing the EMS system.

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Ing. Pavel Vajčner, Znovín Znojmo

ENVIRONMENTAL POLICY AND ENVIRONMENTAL ACCOUNTING IN THE SLOVAK REPUBLIC

Pavol Vincúr

Ladies and gentlemen

At the beginning, let me express my thanks to organisers for invitation to the international seminar on environmental policy and environmental accounting issues

In my contribution, I would like to inform participants of the seminar on analysis of the present development of environment quality in the Slovak Republic, on determinants of the future development of environment quality in the Slovak Republic, on the Slovak Republic position in developing and implementing the sustainable development concept, and with starting situation of environmental accounting in the Slovak Republic.

Life scientists, experts in social sciences economists and businessmen know already that the world fundamentally changed at the break of millennium. The most important thing for our theme of the International seminar is the fact that even global life-giving biospheric systems started to be so seriously disturbed. These are mainly the global climate and hydrosphere system, stratospheric ozone layer, the atmosphere global circulation system, hydrological cycle, and circulation of the oceans and creation and erosion of soils. On the planetary scale, each of this systems functions as one system, and our lives depend on all these systems. On the other hand, we all contribute to their disturbing, each with different share. However, we often refuse to take our part of responsibility. That's because all these forces have great inertia, so the manifestation will take place after very long time period. We must learn to know and respect environmental limits on all levels, from microscopic to the planetary ones. We can simply summarise them as biodiversity (biological diversity on genetic, intra-species, inter-species, and social levels, that is cultural diversity), functional ecosystems, and global life-giving biospheric systems. Environment represents public goods belonging to everybody. Therefore, the rules for its use must be determined by the state. However, the environment components do not know borders. And that's the reason why international and global institutions and processes are so important. Because of all these reasons, all democratic states enter into international agreements on the environment protection. Such agreements can have really global character - then, they apply to either global life-giving biospheric systems or global issues (e.g. transportation of dangerous wastes). We talk about multilateral environmental agreements (MEAs).

In the second part, let me inform you on analysis of determinants of the Slovak Republic environmental quality development.

With respect to very broad and multi-layer issues of the environment quality, I would like to narrow my view on the environment quality in relation to the economic development of Slovakia. Certain kind of bi-directional causality exists in this relationship; and for the country with transitional economy in particular, it is very important to know the dependence of the environmental components quality on development of the extent and way of economic activities in the landscape as well as the ability of the landscape environmental policy to

influence this environmental quality and the ability of economy to create the necessary source basis for the environmental policy measures.

The present state of the environment quality in the Slovak Republic represents to a great extent the result of many years of inconsiderate utilisation of nature resources, extensive pollution of the environment components, and the man's unbalanced interference with the nature and the landscape. Although such situation can be considered as satisfactory, it is impossible to change it to the fully satisfying situation immediately. Because the transition to its higher quality requires systematically aimed approach, efficient involvement of all interested departments and individuals in preparation and implementation of the corrective as well as preventive measures, and, last but not least, also sufficient volume of financial resources.

In the context of overall developmental trends, the quality of principal components of the environment (mainly air, water, and soil) can be characterised by the means of specific qualitative indicators of the air, surface water, groundwater and soil, as well as the quantitative indicators of the amount of pollutants released from manufacturing and consumption processes into the environment. In the following part, I would like to point to very brief assessment of development of the air, water, and soil quality in the Slovak Republic.

Because the fact that Slovakia is located in the middle of Europe, the share of trans-border long-distance transfer of harmful substances on regional air pollution in Slovakia is approximately 70 %. In general, it can be stated that air pollution by nitrogen oxides and airborne dust contributes mainly to the deteriorated air quality. Development of emissions of the main pollutants into the air on the territory of Slovak Republic shows significant decreasing trend between the years 1993 - 1998. Emissions freed from stationary sources are shown in the table 1. It is clear from the table that emissions of solid substances decreased in the year 1998 to 39.23 % of the level in the year 1993, sulphur dioxide emissions to 55.26%, nitrogen oxides emissions to 63.11 %, and carbon monoxide emissions to 64.64 %. In the case of emissions from mobile sources, solid substances decreased in the year 1998 to approx. 87.1% of the year 1983 level, nitrogen oxides emissions decreased to 84.76 %, and carbon monoxide to 95.4 % of the level in the year 1983. From these values, you can see that decreasing emissions from mobile sources (predominantly from transportation) is much more problematic than in the case of emissions from large stationary sources. From the point of view of branch structure of polluters, in the case of solid emissions, the share of industrial energetic and combustion processes recorded significant decrease (decrease to the 29 % of the level in the year 1983), industrial technology processes (to 41.65%) and production of chemicals and chemical fibres . On the contrary, electric power production and distribution recorded quite small decrease (83.2%). The most radical decreasing of sulphur dioxide emissions took place in the field of production and distribution of hot water and steam (to 17.45 %), in the branch of production and processing of non-ferrous metals (17.23%), and in the energy industry (31.54 %). Similarly low decrease has been recorded in the field of electric power production and distribution (87.9 %). The most significant decrease of nitrogen oxides emissions has been recorded in the field of hot water and steam production and distribution (22.76%), and they decreased to 68.83% of the year 1993 level in the field of chemical production. The most significant decrease of carbon monoxide emissions has been recorded in the case of the biggest polluter, iron and steel production and processing. On the contrary to the main pollutants, the heavy metal emissions have no decreasing tendency, moreover, in their case, it is impossible to reliably determine any trend, because the time sequence of statistically reported indicators is short and the emission values fluctuate from year to year. The greenhouse gases emissions reached the highest level at the end of 80 s;

decrease by approximately 25 % took place between the years 1990 through 1994 under the influence of overall economic recession. Nevertheless, with gradual revitalisation of economic growth, we are recording their moderate increase since 1994.

Table 1. – The emissions of basic pollutants from stationary sources into the air

	1992	1993	1994	1995	1996	1997	1998
Solid emissions	173.9	139.7	87.3	89.0	67.0	60.3	54.8
SO₂	373.7	319.3	235.7	236.4	224.2	198.2	174.4
NO_x	224.3	132.3	120.5	128.4	86.7	79.7	83.5
CO	235.0	260.8	226.6	219.7	192.2	191.7	188.6

Source: Statistical Office of the SR: Environment in the SR, selected indicators 1992-1996, Bratislava 1997, Environment in the SR, selected indicators 1993-1997, Environment in the SR, selected indicators 1999.

Development of water management in the past reflects various aspects of the water sources utilisation and protection against pollution and misuse. In other period, the requirement of conservation of healthy water ecosystems and their sustainable use stands in the foreground. To support this strategy, monitoring of surface waters quality is implemented as well.

Since the year 1994, surface water quality is monitored on 232 sampling places and 8 special sampling places. Indicators of the oxygen regimen, basic and supplementary chemical indicators, biological and microbiological indicators are monitored. Additionally, heavy metals and radioactivity indicators are monitored in the special sampling places. From the point of view of oxygen regimen, basic chemical substances, and biological and microbiological indicators, no watercourse in the SR met the requirements for classification in the first, the highest, quality class (very pure water) in the other years. Basic chemical and physical indicators as well as biological and microbiological indicators exceeded also limit values for the II. quality class (pure water). Majority of the indicators reached the value for third (polluted) or fourth (heavily polluted) quality class. Biological and microbiological indicators show the worst results – except Danube, Small Danube, Dunajec, and Moravia rivers, all watercourses in Slovakia reach the classification in the fifth (very heavily polluted) category of the surface water quality in majority of their length.

Regarding utilisation of surface waters as the medium for withdrawal of pollutants influencing markedly the surface watercourse quality, it can be stated that the volume of pollutants released into watercourses has overall decreasing tendency.

Table 2 – Indicators of quantity of pollutants released into surface waters

	Unit	1990	1994	1995	1996	1997	1998
Waste waters	Millions of m ³	1,208	1,223	1,168	1,139	1,058	1,138
IM	Thousands tonnes	100	41	45	41	37	29
BOD₅	Thousands tonnes	100	34	32	27	23	22
COD	Thousands tonnes	247	107	87	76	69	66
NES	Tonnes		772	879	627	565	512

Source: Statistical Office of the SR: Environment in the SR (1996, 1997, 1998); Report on the Environment Condition in the SR in the year 1998, MoE SR, 1998.

From the point of view of pollutant in wastewaters released into surface waters, in which the quantity of produced pollution is monitored (insoluble matters, biological oxygen demand, chemical oxygen demand, and non-polar extractable matters), marked tendency of decrease of total production of pollutants is visible in other years.

Slovakia belongs to countries with low acreage of agricultural land (49.9 % of the SR area, 0.45 hectare of agricultural land per inhabitant). Arable land amounts to 30.23 % of the SR territory (0.28 hectare of arable land per inhabitant), while its area is constantly decreasing. From the point of view of pollution, soils in the SR are contaminated with hazardous substances to relatively small extent. Based on the area survey of soil contamination, approximately 69.5 % of soil is ranked into the category of non-contaminated soils, 28.7 % to the category of risk soils, 1.4 % are contaminated soils, and 0.4 % are heavily contaminated soils. The heavily contaminated soils appear in the vicinity of Košice, where it is the case of $MgCO_3$ contamination exceeding limit. Contamination of soil with water soluble fluorine is localised in the area of Žiar nad Hronom. Soil degradation with erosion processes, resulting in creation of ditches and rivulets, lowering of the soil profile depth, loss of fine earth and nutrients, worsening of the soil structure and finally lowering of natural soil fertility, damage of the vegetation cover, watercourse pollution, and silting-up of water reservoirs, continues to remain serious environmental problem.

Factors negatively influencing environmental as well as production properties of the agricultural land include also wrong agricultural practices, faulty design and application of drainage and watering systems, improperly designed and operated disposal of agricultural, industrial, and municipal waste. Negative impact of agriculture decreased during the economy transformation period as the result of overall decrease of agricultural production as well as decreased use of agrochemicals.

Forest land resources are endangered mainly by emission load resulting in overall acidification of soil, direct damage to the forest stand by acidic precipitation as well as decrease of overall resistance of the forest ecosystems against pest organisms.

What are the expected impacts of economic sectors to formation of environmental problems?

- Industry. Its fundamental share on all environmental problems of local as well as global character (climatic changes, acidification, increase of tropospheric ozone, chemical risks, waste, soil, technological hazards, urban environment quality) continues to dominate. Despite the fact that environmental goals started to be integrated into decision-making in industry, considering total growth of industrial production in the EU countries (which is also predicted for the years 2000-2010 in the extent of 2 – 4 %), we do expect increase of energy consumption, stabilisation of the CO_2 emissions, decrease of the SO_2 emissions, but increase of industrial waste and primarily uncertainty on the field of chemical and technological risks.
- Energy production. Continuation of the present trends is expected, without more significant utilisation of renewable energy sources before the year 2015. Considering technology changes, decrease of SO_2 and NO_x emissions, slight increase of CO_2 as the consequence of increase of electric energy production.
- Agriculture. Decrease of the pesticide and fertiliser utilisation will not be so significant as between 80s and 90s. However, increasing problems with disposal of excrements from animal production and consequent impacts on water resources quality can be expected in some countries.

- Transportation. With continuing development and growth of its extent, its impact on the environment will increase as well. Therefore, environmental measures will focus on improvement of emission standards of motor vehicles and quality of fuels, which will allow to lower the NO_x and VOC emissions. Obviously, CO₂ emissions from transportation will remain outstanding problem.
- Tourism. Its marked negative impact on flora and fauna will continue to manifest in coastal and mountain areas. Also the increased demands on sewerage and water supply systems will create problems. In 2010, growth of tourism in Europe is expected to increase by 50% compared to the year 1995.

What are the goals in the field of environmental components quality in the EU countries and in the SR, and what are the estimated costs for their implementation?

- Air. In the first half of the 90s, emissions of the main pollutants decreased significantly. Despite that, the air pollution remains to be high. Projects solved in the IIASA modelled the costs necessary for measures to decrease the VOC, SO₂, NO_x, and NH₃ emissions in the years 1990-2010. These were estimated to 58 billions EURO annually (for the ten EU countries). As time passed, these estimates have been updated to 63 – 64 billions EURO annually.
- Water. Amended Council Directive 98/03/EC on water for human consumption updated the criterion parameters for drinking water. It focused primarily on the lead contents (in connection with lead water distribution pipelines). Costs of necessary replacement of the water supply infrastructure are estimated to 27 – 37 billions EURO (during 20 years), whereas the Directive requires reaching compliance by the year 2015. Total investments of the EU states to fulfilment of the said Directive are estimated to 130 billions EURO, which should be spent in the years 2001-2005 (from which e.g. Germany 13.6 billions EURO, Austria to 3.17 billions EURO).
- Waste. In the field of waste management, full covering of waste disposal costs is assumed, which will induce the waste disposal price increase by 20-30%. Annual costs for municipal waste disposal will double by the year 2010.
- Energy. As a consequence of increased energy production, 6% increase of carbon oxides emissions is expected by the year 2010. Nuclear energy problems will remain outstanding. It is mainly about radioactive waste disposal. Long-term radioactive waste disposal is still not resolved in the frame of EU. Proposal to build storage facilities in Australia has been refused by the Australian government. Negotiations of Germany and Spain with Russia took place, however the results of negotiation were not published.
- Soil contamination. Issues of old load is relevant not only in the post-socialistic countries. Assessments of soil decontamination in the EU countries vary according to the degree of required purity (i.e. according to the purpose of the future utilisation). Considering very high costs of total cleaning (which has been estimated to 46 billions EURO in the Netherlands), lower degree of purity is approached, decreasing the cleaning costs by approx. 30-50 %.
- Chemicals. In April 1999, Germany presented proposal to speed up the risk assessment of chemical substances used in the EU. This requirement was justified by increased failures of endocrine system of man as well as animal species as a consequence of negative impact of chemical substances. The problem of the flat implementation of risk analysis is represented by the related high costs. These are in the range of 100,000 EURO for the basic set of data, through 5 millions EURO for complex testing of a compound, up to 15 millions EURO in cases where special tests and monitoring are required. Currently,

approx. 95,000 chemical substances are in the circulation, which are not completely assessed from the point of view of their adverse impact on health.

Goals of the environmental strategy and policy of the Slovak Republic, put in concrete terms in the National Environmental Action Programme, appear in the context of environmental goals connected with the National Programme for acquisition as a certain subset of EU goals on the field of environment. Therefore the environmental strategy must be oriented to these more stringently defined international goals as well as goals anchored in international agreements

Despite the fact that Slovakia accepted conclusions of the UN conference on environment and development (UNCED) in 1992, as well as conclusions of the other important international conferences and agreements, their implementation in practice remained mostly on theoretical or declarative level. Practical fulfilment has been hindered by a series of circumstances: from insufficient political will, through insufficient education system and consequent low knowledge of the public on sustainable development (SD) issues, up to inadequate personal, organisation, and functional background.

Inertia of departmentalism and old technocratic approaches, which are surviving, although in more sophisticated form, up to now in many areas, had a negative effect. Up to the year 1999, an interdisciplinary body such as the Government Council for SD was lacking in Slovakia, access of general public to relevant information has been limited (the SR National Council Act No. 171/1998 Coll. on Access to Environmental Information came into force as late as in 1998, and the SR NC Act No. 211/2000 Coll. as late as on 1st January 2001) as well as participation of the public on planning, decision-making, monitoring and checking of fulfilment of the relevant decisions.

Insufficient attention has been paid to promotion of Agenda 21, and its publication - only as the MoE SR purpose publication - took place as late as in 1996. From the point of view of the Agenda 21 implementation in the SR, the document Draft of Agenda 21 Implementation and Evaluation of SD Indicators in the Slovak Republic, which has been accepted by the SR Government in 1997, had to be of principal significance, but its practical fulfilment didn't took place in most provisions yet.

Significant role should be played by the Slovak Republic Government Council for sustainable development (founded in 1999), acting as consulting and co-ordination body of the government for implementation of the Agenda 21, principles of sustainable development, and assessment of the sustainable development indicators on the all-state level.

From the documents supporting SD, the following ones are elaborated or under preparation:

- Strategy, principles, and priorities of the State environmental policy (1993)

The document includes 8 preferred activities and 5 priorities (air pollution control, and global environmental safety, ensuring sufficient drinking water and reduction of other waters pollution below permissible level, soil protection against degradation and securing harmlessness of foodstuffs and other products, minimisation of waste generation, utilisation and proper disposal of waste, biodiversity conservation, protection and rational use of natural resources, and optimisation of spatial structure and utilisation of landscape). Considers three time horizons (short-term, medium-term, and long-term).

- National Environmental Action Programme (1996, updated 1999)

Consists of 10 thematic areas containing set of concrete measures for the benefit of environment improvement and sustainable development and determines the time and financial frameworks of their implementation as well as responsible subjects.

- National report “Heading Towards Sustainable Slovakia”, as an example of the MVO approach (STUŽ/Society for Sustainable Living /SR, 1996): Comparison of sustainable and really utilised environmental space showed that Slovakia exploits its environmental space several times over the recommended level for most of monitored commodities. This is mainly about energy production and consumption of non-renewable raw materials as well as production and consumption of commodities on their basis. Positive exception is created by environmental space from the point of view of acreage of nature conservation areas, which is close to the recommended one, and proportion of built-up area, which is so far lower compared to the EU average.

- Conception of the Agenda 21 Implementation and Evaluation of Sustainable Development Indicators in the Slovak Republic (1997). Resolution to the draft of Agenda 21 Implementation and Evaluation of Sustainable Development Indicators imposes, beside other, on the ministers and heads of other central bodies of the SR state administration to evaluate implementation of Agenda 21 chapters and the sustainable development indicators in the Slovak Republic according to the determined gestorship.

- The project “Supporting Sustainable Development in the Slovak Republic (1999-2000) is in the course of implementation. The Project consists of three parts: elaboration of National Sustainable Development Strategy, Model Implementation of AGENDA 21 on Regional Level, Small Grant Programme for Self-Governments and for Non-Government Organisations to support activities focused on sustainable development.

In the years 1999-2000, the SR Government accepted or incorporated into its activities plan several significant cross-sectional documents, practically all of them stating already they are based on the principles of sustainable development, or their goal is to support sustainable development. Among them, the most important is the Conception of Decentralisation and Modernisation of Public Administration (2000). Several cross-sectional documents are focused on regional development, e.g. Integrated Plan of Regional and Social Development of the SR for Implementation of the PHARE 2000 Programme, part 1 – National Developmental Strategy, MVRR SR (1999), Plan of the Slovak Republic Countryside Development for Implementation of the SAPARD Programme (1999). Other cross-sectional document is under preparation, entitled National Plan of Regional Development (2000) and the Conception of the Land Development of Slovakia 2001 (2001). Also other department development documents, namely from the last two years, include heading towards sustainable development among their aims or even priorities.

When we want to talk about environmental accounting, first, we must look at the significance of accounting at general.

Accounting has several functions in a company. One part of accounting – financial accounting – is a tool for keeping and reporting information, it is a standardised mean of

gathering information and communication with external users. The second part of accounting – managerial accounting – provides information helping managers to plan and control the company activities and to evaluate performance of the company, that is profitability, as well as financial performance of the company in the field of environment. This part includes complete system of identification, monitoring, and reporting the company environmental impacts, and includes these impacts into the company decision-making on production costs, pricing of the products, budgeting, product design and performance appraisal.

To allow the accounting to provide these functions, it is necessary to determine unequivocally the involved parties. Company entrusts control of large portion of its wealth to the management of the capital company. This results in situation where executive managers are reporting to a great number of internal and external interested parties. Owners of the company are immediate users. Owners are interested in property level and performance of the company. Owners are looking for protection against debts from the external environment.

The role of accounting standards becomes clear also from the functions of accounting, and from the circle of users of financial reporting. Standards are providing the company with base on which the situation and performance of the company is recorded, compared, and analysed. The standards ensure separation of factors from opinions and non-qualified facts.

The integral scheme of accounting standards and related processes has been developed over a long time period. This time span reflects changes in business, technology (partially in computers and telecommunications), and also in governments (local, national, and international). Accounting standards express these changes and are responsible for satisfaction of information requirements on reporting from various users.

Currently, with increasing responsibility to obligations of environment protection and environment regulation, financial reporting presents additional tasks to accounting standards and processes. Connection between environmental effects and financial results is the subject of interest of companies, environmental impacts, control of the impact by the company, and financial impacts on the company. Creation of these relations presents urgent task for the company and accounting profession as well as for general public interested in environmental protection.

Intergovernmental workgroup of experts for international accounting standards and reporting, working at the UN (ISAR), started to deal with issues of environmental accounting on the company level seven years ago. The group of experts expressed concerns that accountants stayed aside during negotiation of environmental issues, and that their role in the management has been ignored. Accountants failed during application of conventional accounting model on environmental issues even when survival of the company depended upon solution of this question. Connection between environment management and environmental accounting follows from the watchword “what cannot be changed, cannot be managed”.

There are many reasons why environmental issues must be incorporated into accounting of the company:

- Accounting of companies should reflect the behaviour of companies towards environmental issues and impact of expenditures on the environment, resulting risk and debts on the financial position of the company,
- Investors need information on efficiency of measures related to environment and expenditures connected to the environment for their decision-making,

- Urgent environmental issues are questions of management, manager needs for identification and allocation of expenditures on the environment so that the products will be properly priced, and that the decision-making on investments will be based on truly expressed costs and yields,
- Companies should be able to utilise advantages resulting from competition for the customer if they are able to prove that certain goods and services are preferred from the environmental point of view,
- Environmental accounting is the key to sustainable development.

Majority of companies agreed that sustainable development is the main goal of economy. Companies struggling for “eco-efficiency” suppose that it will guarantee permanent benefit; however, they are able to measure this efficiency resulting from adhering to environmental rules only through finding out exact information on environmental costs and yields as well as on performance of measures related to environment.

Slovak Chamber of Auditors – Committee for Methodology and Legislation in co-operation with the Committee for Education – are preparing, in the conditions of Slovak Republic, seminar on environmental accounting till the end of 2001. Goal of the seminar will be to inform and give instructions for solution of accounting issues related to environment, and to identify the best practical processes selected by national processors of standards during development of their own accounting standards, rules of regulations. The seminar should contribute to definition of questions appearing in the accounting of a company, and impact of environmental issues on reporting.

Participants of the seminar should:

- Be acquainted with various open questions of environmental accounting,
- Be able to integrate the open questions of environmental accounting into conventional financial accounting, cost accounting, and audit of the balance of books,
- Identify areas where it is necessary to create accounting directives,
- Know which are the key organisations in the field of environmental accounting, know their statements, and be able to use these statements in the process of creation of future directives.

Aim of this seminar will be to introduce the participants into the problems of indicators of financial performance of companies in the field of environment (Environmental Performance Indicators - EPI), to explain concept of efficiency of environmental measures and connection between environmental financial performance and economic performance. Participants of the seminar will be acquainted with proposed set of generally usable indicators of EPI. Illustration of recalculation of generally usable indicators of EPI and use of these indicators to improve the decision-making quality will follow next.

It is the UN – ISAR project entitled “Standard indicators of financial performance in the field of environment”, which goal is to determine and to develop generally applicable EPI indicators and their standardisation. These indicators should determine financial performance in the field of environment in companies should meet the requirement of external communication to non-professionals, should be applicable on global scale, should be significant for the company, primarily during negotiation of financial performance in the field of environment during financing.

Ladies and Gentlemen,

I ventured to inform you briefly on the current state and tasks of the environmental policy of the Slovak Republic, and the tasks, which the Slovak Chamber of Auditors faces in the field of environmental accounting.

Thank you for your attention.

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