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Environmental Approaches towards Industrial Company Management in the Czech Republic

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1. Introduction

Consumption is a way of life typical for most of the world nowadays. Companies not only produce economic value but, through their production and consumption, they contribute substantially to environmental pollution and damage. Particular States and companies are pressurized to enhance their economic growth. However, steady economic growth brings with it a lot of negative effects - environmental damage being one of them. Nowadays, the issue of CO₂ reduction is at forefront of discussions in the European Commission and other contracting states of the Kyoto Protocol. Company activities need to be regulated by an environmental legislation on international as well as national level. On the other hand, company's environmental behaviour is, to a certain extent, a question of its' self-determination and is dependent on managerial decisions. Companies can conform to the legislation only (reactive strategy) or can be voluntarily environmentally-proactive beyond the remit of legislation (proactive strategy). This chapter deals with the proactive approach towards the protection of the environment and how this is applied through so called voluntary environmental instruments by Czech industrial companies. Sections two and three introduce the proactive concept and the level of its adoption within the business environment. In section four, results of research into the 'environmental approach to production and business activities in a company', conducted by the authors of this chapter, will be presented.

2. Reactive vs. preventive strategies of environmental conservation

Many forms of preventive as well as reactive strategies for environmental conservation are being used in industrial engineering. As the name indicates the preventive strategies endeavour to prevent the origin of damage and seek for sources of pollution and waste. Preventive strategies have more potential and their realization should be supported. (Hyrslova, 2002) The reason why reactive strategies are not so effective or promising is to do with the fact they do not focus on the sources of environmental damage but only try to mitigate the negative consequences of production. The reactive approach is applied through implementation of so called "end-of-pipe" technologies that are as follows: for example, refuse compactors, collection containers and vehicles, waste heat recovery systems, air pollution filters, noise abatement investments and sewage treatment plants. As a result, the quantity of toxic agents in one environmental domain drops but rises in another domain.

Companies, as mentioned above, can be voluntarily environmentally-proactive beyond the remit of legislation that is becoming more and more stringent. Companies (no matter what size they are) have a range of voluntary environmental instruments at their disposal, that are of a preventive character and endeavour to find the sources of raw material and energy wastage and to do away with the causes of environmental pollution as a consequence of production. Table 1 provides an overview and comparison of chosen voluntary environmental instruments. Particular instruments differ in benefits for a company as well as expenses connected with their implementation.

Comparison criterion	Voluntary methods and instruments						
	EMAS	EMS/ ISO 14001	EMA	Ecodesign	LCA	Evaluation of Cleaner Production possibilities	Eco- labelling
Purpose	Regulative	Regulative Educative	Informative	Regulative	Informative	Informative	Regulative
Focus	Systems	Systems	Processes	Products	Products	Processes	Products
Normalization	Yes	Yes	No	No	Yes	No	Yes
Necessary external assistance	Yes	Yes	No	No	No	No	Yes
Preventive strategy	Yes	Yes	No	Yes	Yes	Yes	can be
Financial claim connected with an implementation	Yes	Yes	No	Yes- Conside- rable	Yes- Conside- rable	No	Yes
Labour input intensity	No	No	Yes	Yes- Conside- rable	Yes- Conside- rable	Yes	No
Economic benefits	Yes, partly	Yes, partly	informative benefits more likely	Yes	No	Yes – considerable	uncertain
Dedicated to	All company types	All company types	All company types	Manufac - turing companies	All company types	All company types	Companies with products/ services included in existing product categories
Logo/certificate	Yes	Yes	No	No	No	No	Yes

Table 1. Comparison of chosen voluntary environmental instruments

Voluntary environmental instruments are not only a significant tool for enhancing production efficiency and competitiveness, but also a forceful instrument of environment preservation. This double effect used to be called the win-win principle (environmental and economic). However, this win-win principle is not typical for reactive strategy within which end-of-pipe technologies are implemented. Investment for environmental preservation can be thus divided into two groups according to technology used, they are:

- Investment in integrated facilities (dedicated to pollution prevention),
- Investment in end-of-pipe facilities (dedicated to pollution removal).

Statistical data on `investment for environmental preservation`, related to business sector, has been available since 2003, whereas data for a public sector has been available only since 2006. Statistical data regarding environmental investment according to technology type has been monitored within the new ascertaining (ŽP 1-01) and the public sector has been interviewed since 2006. Some of the respondents do not structure their investments into the above categories and a small portion (to 3.5 %) of environmental investments stay therefore unclassified. In figure 1, a comparison of investment volumes into integrated and end-of-pipe technologies is displayed, for both business and public sector. (Kozouskova, 2008)

Fig. 1. Types of investment for environmental preservation, (Kozouskova, 2008)

According to the Czech Statistical Office investigations carried out in 2006 and 2007, companies implementing only the end-of-pipe technologies still prevail in the Czech Republic. (Kozouskova, 2008) In 2006, the total investment for environment conservation was about 13, 076 mil. CZK, whereas investment volume amounted to 57.8 % for end-of-pipe technologies and 40.9 % for preventive technologies. In 2008, the situation seemed to be slightly more favourable, the total investment for environment preservation rose to 14,208 mil. CZK, the portion of end-of-pipe technologies was approximately 52.1 % and portion of preventive technologies rose to 44.6 %. (Vlckova, 2004) Conversion from corrective measures towards prevention is indisputably a positive trend, however, end-of-pipe technologies remain to be the only instrument for environmental preservation in many companies, despite the fact they are very expensive, their operation is very costly and effect for the environment is insufficient. Many companies are still afraid of the enhanced costs connected with the application of environmental instruments. Environmental conservation is perceived as a costly issue obstructing the economic performance that is therefore not worth adopting. On the top of that, according to the investigations carried out by the Ministry of Environment in the Czech Republic only 45 % of companies are able to enumerate the total costs for the system implementation and total revenues. The efficiency is

difficult to calculate. (Vlckova, 2004) In section 3, the most important proactive instruments are characterised briefly and the level of their adoption by Czech industrial companies is described as well.

3. Voluntary environmental instruments and their usage in the Czech industrial companies

3.1 Environmental management systems (EMS)

At present there are two standards for environmental management system implementation:

- Technical standard ISO 14 000; and
- Regulation (EC) No 761/2001 of the European Parliament and of the Council of 19 March 2001 allowing voluntary participation by organizations in a Community eco-management and audit scheme (EMAS).

The implementation of these EMS standards differ in the number of requirements specified by each standard. In ISO 14 000, some of the items required in EMAS are merely recommended, or sometimes not even specified. The main differences in the requirements of both above systems are shown in table 2. Because of the stricter requirements imposed by EMAS, only 28 Czech companies are certified according to EMAS; whereas about 3000 Czech companies have obtained certification according to ISO 14 000. In figures 2 and 3, a trend in number of Czech companies having implemented EMAS and ISO 14001 is displayed.

Fig. 2. Companies with EMAS implemented in years 2000 – 2009, (Cenia, 2009)

3.2 Environmental management accounting

UN Division for Sustainable Development, Expert Working Group on "Improving the role of Government in the Promotion of Environmental Managerial Accounting" defines the environmental management accounting as follows: Environmental management accounting (EMA in the following) is integral instrument to company management enabling

identification of environmental costs and revenues. Within EMA, financial flows as well as physical and energy flows are observed; EMA thus consists of two subsystems: (Jasch, 2002)

1. Monetary EMA – MEMA; and
2. Physical EMA – PEMA.

Fig. 3. Companies with ISO 14001 implemented in years 1997 – 2005, (Klasterka, 2007)

Among the main tasks of EMA are cost identification, data collection, and the preparation of estimations, analyses and reports. Collectively these activities contribute: (Jasch, 2002)

- information about material and energy flows;
- information about environmental costs; and
- other information expressed in values that are the starting point for decision making in a company.

Within EMA the information from both subsystems is interconnected and the value aspect of material and energy flows is expressed. The information that is monitored relates not only to a company as a whole, it can even relate to particular business processes, sections and plants. Among the aims of EMA are: (Jasch, 2002)

- enhancing efficiency of material and energy utilization;
- mitigation of environmental impact of company activities, products and services;
- mitigation of environmental risks; and
- trading income improvement.

Many companies are not familiar with the concept of environmental accounting, this refers especially to small and medium-sized enterprises (SME) which show little interest in this issue. They work to keep within regulatory limits and to minimize their environmental costs. This problem is aggravated by the absence of a simple methodology to monitor the environmental costs and revenues in SMEs.

-----	ISO 14001	EMAS
Force	worldwide	EU members
Acceptance	all kinds of companies (e.g. industry, services, public service)	all organizations that have impact on the environment
Implementation	economically separate parts of a company or a company as a whole	in the whole company area
Introductory environmental review	not requested but recommended	compulsory
Public documents	only environmental policy	environmental policy and the declaration about the state of the environment
Environmental declaration	none	is requested
End of the process	certification	verification of declaration about the state of the environment
End of the process ensured by	auditor of a certification company	accredited environmental verifier
Frequency of audit	not provided	three-year most
Logo usage	none (except the certification authority logo after an agreement)	usage of EMAS logo
Registration	in terms of issued certifications by particular certification organizations	corresponding subjects of particular member states

Table 2. Comparison of EMS according to ISO 14001 and EMAS, (Cenia, 2006)

The situation is much better in larger companies which often have a proactive attitude to protection of the environment. They often compile their own environmental accounting system to manage their high environmental investments and significant operating costs. (Ruzicka, 2002)

3.3 Cleaner production

The concept of cleaner production is being connected with the integral preventive strategy which is applied especially to production. The aim of this strategy is to do away with the causes of environmental pollution as a consequence of production. All the company processes are observed as a whole in terms of their impact on all domains of the environment. It is therefore not possible to transfer the negative impact from one domain of the environment into another one as it is with the end-of-pipe technologies. In order for the sources of undesirable waste to be identified, material and energy flows are monitored within cleaner production.

Afterwards the possibilities of elimination of these sources are explored, namely: (Remtova, 2003 - a)

- 1. Ease of technical feasibility;

- 2. Final economic efficiency;
- 3. Environmental efficiency.

The implementation of cleaner technology in a company is not a one-shot action but a long-term process. Effectiveness is the reason why a company should deal with cleaner production. In other words, reducing raw material and energy consumption reduces the negative impact on the environment. Waste increase is thus being prevented at the source and this leads to a significant economic effect at the same time. The negative impact on the environment can be reduced by engineering as well as non-technical (organizational) methods, which are very effective and are connected with none or very low costs in many cases. In the Czech Republic, cleaner production activities were introduced in 1992 within a Czech-Norwegian project dedicated to establish the fundamental facilities for widening the concept of cleaner production. The Czech Republic adopted the cleaner production strategy officially in 1999 when the International Cleaner Production Declaration was signed. Later on in 2000 the Cleaner Production National Programme (NPCP) was adopted. (Cenia, 2005) An essential amount of the projects was assured by the Czech Centre of Cleaner Production (CPC), and by the Cleaner Production Centre in Brno city. However, the application level of cleaner production is in practice rather low, as can be seen in the figure 4.

3.4 Eco-design

Eco-design is one of the preventive oriented voluntary regulative instruments of environmental policy. While cleaner production focuses on a company as a whole, the concept of eco-design concentrates on product development and design. Eco-design incorporates requirements of environmental protection into product design and development.

Fig. 4. Number of cleaner production projects in years 1992 – 2006, (Cenia, 2008)

So far there is no unified definition of eco-design. In general, eco-design can be defined as a systematic process of product design and development which puts emphasis not only on classical features such as functionality, economics, safety, ergonomics, technical feasibility,

aesthetics, but it also emphasize the minimum negative impact of a product on the environment during its whole life cycle. (Remtova, 2003 -b)

Eco-design activities are mainly concerned with: (CIR, 2004)

- substitution of dangerous materials with less dangerous ones,
- implementing measures leading to waste minimization,
- reduction in raw material consumption,
- packing and transportation optimization.

Eco-design is not an unknown concept to Czech engineering designers and some manufacturing corporations. Product innovation volume in the Czech Republic, however, is unsatisfactory. On the basis of the Innovation and Development Centre investigation from 2004 it is obvious that the total investment in development and innovative technologies in companies was only 48 billion Czech crowns, which is less than 2 % of the sales in all innovating companies. According to these investments 45 % was spent on new technologies and equipment, but only 2 % was invested in design projects. (CIR, 2004)

3.5 Life Cycle Assessment (LCA)

LCA is one of the most important information instruments of an environmental oriented production policy. LCA evolved from the Resource and Environmental Profile Analysis (REPA) in the USA during the late 60's and 70's of the 20th century. This method focused on product evaluation in terms of energy and raw material consumption. (Remtova, 2006) In order for the negative impacts of a particular system on the environment to be determined, inputs (material and energy flows) for production and outputs (production and services, waste) to the environment are compared within LCA.

LCA provides information about the impacts of a product in terms of its whole life. This method considers emissions in all domains of the environment during the production, utilization and product disposal phase. Effects of other processes related to acquiring raw material, material and energy production are involved as well. The structure and procedure of LCA is strictly determined by the International Standard ISO 14040 that defines the LCA as 'gathering and evaluation of inputs, outputs and potential impacts on the environment during the whole life cycle of a product system'. Commercially available databases of processes as well as material and energy flows are being used for effective LCA studies processing.

3.6 Eco-labelling (environmental declaration type I)

Eco-labelling is a system that certifies that specific products and services have less negative impacts on the environment than their competitors and are, therefore, friendlier to the environment. This system is directed by an independent third party. Nowadays there are more than 30 eco-labelling systems and their number is increasing. National or supranational labels are assigned within those systems. Eco-labelling is regulated by ISO 14024. The products and services that apply for the certification have to meet many requirements concerning quality of the product (service); particular production phases; use of raw material and technologies, and final disposal. In contrast to the majority of preventive strategies focusing on systematic examination of manufacturing processes, eco-labelling makes use of market mechanisms outside the company which are based on supply and demand. In the Czech Republic, the eco-labelling system was established due to an initiative of the minister of Environment and the minister of Economy. In 1994, the National Program of Environmental friendly product was declared in the decree of the government.

The trade mark is a property of the Czech Ecological Institute (ČEU). (Ekoznaceni, 2003) In the Czech Republic, the eco-labelling system is executed as the National Programme of Environmentally Friendly Products Labelling, respectively on the basis of the Government Decree Nr. 159 from April 7, 1993.

However, the environmentally friendly products market has so far not evolved very much in the Czech Republic, economic return is therefore relatively low. The eco-labelling eco-efficiency is rather poor, despite the fact that the Czech eco-labelling programme is so far much cheaper than foreign programs, as a registration fee of only 735 EUR needs to be paid. (Vlckova, 2004) The figure 5 shows the number of eco-labelling licences awarded between years 1994 to 2004.

Fig. 5. Number of Czech eco-labels awarded between years 1994 and 2005

4. Research regarding environmental approach to production and business activities in a company

4.1 Characterization of the research and the surveyed sample

At the beginning of 2009 (from January to April), the authors conducted, along with the Institute of industrial management, Ltd., research on an "Environmental approach to production and business activities in a company". 150 mechanical engineering companies located in the western part of the Czech Republic, randomly selected, were sent questionnaires, from which 37 companies (24.7 %) returned a completed questionnaire. In the questionnaire, questions were asked regarding companies' attitude to environmental activities, purchasing of green products, certification according to ISO 14001 and EMAS or application of environmental instruments.

The interviewed companies were classified into three groups (small, middle and large) according to criteria of the Industry Association of the Czech Republic. 21 companies (57%) represented large companies (501 and more employees and turnover over 101 millions

CZK), 10 companies (27 %) represented middle companies (101-500 employees and turnover above 101 millions CZK) and 6 companies (16 %) represented small companies (1 - 100 employees and turnover to 30 millions CZK) (see figure 6). 58 % of interviewed companies were all-Czech, whereas 29 % of companies stated that the bulk of their capital was foreign (see figure. 7). On the basis of the existing situation, the voluntary environmental activities were anticipated to be applied especially in the larger companies with the bulk of the foreign capital share. This presumption, however, has not been confirmed by the research conducted. No clear connection between foreign capital share in a company and the company attitude towards the environmental activities has emerged from the research. 90 % of companies with bulk of the foreign capital stock acknowledged a passive approach towards the environment conservation within their company activities.

Fig. 6. Size structure of the companies

Fig. 7. Share of foreign capital stock in the companies

4.2 Research outcomes

As the research showed, only 19.4 % (big companies only) of all interviewed companies are voluntarily environmentally-proactive beyond the remit of legislation. 81.6 % of all the companies interviewed conform to the environmental legislation only (68.2 % of the large companies, 100 % of the small and middle companies). From the table 3 it is obvious that end-of-pipe technologies prevail in Czech industrial companies. This relates especially to small and medium enterprises (SME). Larger companies implement some of the environmental voluntary instruments like cleaner production (24.2 % enterprises), environmental management accounting (6.1 %), eco-design (6.1 %) and other. Cleaner production seems to be popular, to some extent, to small and middle enterprises as well. Eco-labelling and LCA is not being used by the interviewed companies at all. According to the research outcomes, 42.1 % of companies (large companies mostly) have implemented monitoring system of costs and revenues relating to environmental issue. The situation is obvious from the figure 8. Only 6.1 % of companies interviewed make use of environmental management accounting (EMA). It can be concluded that companies do have their own costs and revenues monitoring system, however, they do not use the information instrument EMA very often. Lack of interest in environmental friendly products indicates the poor relation of Czech enterprises to eco-labelling as well. 34.2 % of interviewed companies do not buy green products and services at all, 28.9 % buy these products rarely and 36.8 % buy these products from time to time. No enterprise buys the green product regularly. This is a closed cycle: no demand, no supply. Poor green products demand is probably the reason why companies do not produce and offer environmental friendly products and services. According to this research 15.8 % of companies deem it necessary that their business partners have implemented EMS, for 28.9 % of companies it is less important if their business partners implement EMS and 10.5 % of companies do not take into account EMS implementation when seeking business partners.

Environmental methods and instruments	Company size			
	Small	Middle	Large	Total
End-of-pipe technologies	60%	81.8%	57.6%	63.3%
Environmental management accounting	20%	0%	6.1%	6.1%
Cleaner production	20%	9.1%	24.2%	20.4%
Eco-design	0%	0%	6.1%	4.1%
Eco-labelling	0%	0%	0%	0%
LCA	0%	0%	0%	0%
Other	0%	9.1%	6.1%	6.1%
Total	100%	100%	100%	100%

Table 3. Usage of chosen methods and instruments for environmental conservation

Companies’ attitude to environmental activities is interesting as well. Environmental activities are perceived by one half of the small companies interviewed as costly and providing hardly any benefits. 60 % of middle companies believe, on the contrary,

environmental activities to be prestigious and beneficial to business. This view is shared by almost 91 % of all large enterprises. Figure 9 demonstrates this situation. Regarding environmental management systems, no small company interviewed is certified according to EMAS or ISO 14001. 60 % of middle companies do not acquire any EMS certification, 30 % are certified according to ISO 9001, 10 % according to ISO 14001. 66.7 % of large companies are certified according to ISO 14001, 8.3 % acquire other type of a certification (mostly ISO 9001), 16.7 % are not certified at all. However, many companies confess the certification means only a formality to them – “scrap of paper”. The above situation is summed up in the table 4. The conducted research has acknowledged the conclusions of investigations undertaken by the Czech Statistical Office, Innovation and Development Centre and Cenia Agency (mentioned in sections 2 and 3) that the voluntary environmental instruments are not sufficiently used in the Czech companies.

Type of certification	Company size			
	Small	Middle	Large	Total
EMAS	0%	0%	8.3%	5%
ISO 14000	0%	10%	66.7%	43%
Neither	83%	60%	16.7%	38%
Other	17%	30%	8.3%	15%
Total	100%	100%	100%	100%

Table 4. EMS certification in companies according to their size

Fig. 8. Level of environmental costs and revenues monitoring according to company size

Fig. 9. Attitude to environmental activities in a company

4.3 Questionnaire

In this sub-section the questionnaire used during the research is presented. The questionnaire was aimed to be as simplest as possible for the respondents, the volume therefore did not exceed two A4 pages and all questions were constructed to be very easy to fill in by ticking off the correct answers. The following text represents an English translation of the original questionnaire that was presented in Czech.

Ladies and gentlemen
We would like to ask you to take part in this questionnaire inquiry that is conducted by the Department of Industrial Engineering and Management at the Faculty of Mechanical Engineering, at the University of Bohemia in Pilsen, and is devoted to research and development purposes only. To fill in the questionnaire, please tick one of the options for every question. It will take you less than ten minutes. Other comments and explanations are, of course, very welcome. Thank you very much for you participation and support in this questionnaire inquiry

1. Has your company implemented monitoring system of costs and revenues relating to environmental issue?

- ☐ YES
- ☐ MORE LIKELY
- ☐ LESS LIKELY
- ☐ NO

2. Is you company certified according to:

- ☐ EMAS
- ☐ ISO 14000
- ☐ Neither
- ☐ Other certification

3. What is your company's approach towards conservation of the environment?

- ☐ We conform to the environmental legislation only.
- ☐ We are voluntarily environmentally-proactive beyond the remit of legislation. How?

4. What methods and instruments for environmental conservation are used within you company?

- ☐ end-of-pipe technologies (facilities for waste and pollution treatment, e.g. refuse compactors, collection containers and vehicles, waste heat recovery systems, air pollution filters, noise abatement investments and sewage treatment plants)
- ☐ Environmental management accounting
- ☐ Cleaner production
- ☐ Eco-design
- ☐ Eco-labelling
- ☐ LCA (Life Cycle Assessment)
- ☐ Other

5. Does your company buy the `green` products and services?

- ☐ YES
- ☐ MORE LIKELY
- ☐ LESS LIKELY
- ☐ NO

6. During the supplier selection procedure, is the environmental approach of the potential supplier essential for you decision? (E.g. ISO 14001, EMAS certification)

- ☐ YES
- ☐ MORE LIKELY
- ☐ LESS LIKELY
- ☐ NO

7. What statement does better express your company's attitude towards environmental issues?

- ☐ Nowadays, it is more and more difficult to avoid the environmental approach that is very costly issue for the company.
- ☐ Nowadays, it is more and more difficult to avoid the environmental approach; however this approach can bring along various financial and non-financial benefits to a company.

8. What is the portion of foreign capital share on the total capital of your company?

- ☐ Majority
- ☐ Larger
- ☐ Minority
- ☐ None

5. Conclusion

In the current business environment, companies need to weather many changes in terms of technical, economic, legislative, environmental and social conditions. If a company endeavours to hold out in the competition and to stay in the market, it has to respect its environmental and social responsibility for its surroundings. Companies have a range of environmental instruments that are not requested by law but are beneficial in many aspects

to company and society as well. So far, the approach of Czech industrial companies has been rather reluctant towards the environmental aspects of business that are perceived as an obstruction to their economic development. Voluntary environmental instruments are used especially by larger companies that hold the ISO 14001 certification. Small companies, on the contrary, are not often even aware of the existence of these instruments and cannot thus know how to make use of them. Among the main barriers to application of the voluntary environmental instruments are, for example, lack of financial funds, lack of qualified workforce, and lack of time. However, it can be stated that Czech industrial companies are awaking to their environmental responsibility and the benefits it can bring, they are slowly moving from taking corrective measures towards prevention applied through voluntary environmental instruments.

6. References

- Cenia. (2005) *Programme for Environmental technologies promotion in the Czech Republic. Program podpory environmentálních technologií v České republice*. Prague. [online, accessed on 2010-17-03]. Available from: <[http://www.cenia.cz/web/www/web-pub2.nsf/\\$pid/CENMSFQP2T8Q/\\$FILE/ETAP%20CR.pdf](http://www.cenia.cz/web/www/web-pub2.nsf/$pid/CENMSFQP2T8Q/$FILE/ETAP%20CR.pdf)>
- Cenia. (2006) *Differences between ISO 14001 and EMAS. Rozdíly mezi ISO 14001 a EMAS*. [online, accessed on 2010-20-05]. Available from: <[http://www.cenia.cz/web/www/web-pub2.nsf/\\$pid/CENMSFZS9TOS/\\$FILE/rozdily_ISO_EMAS.pdf](http://www.cenia.cz/web/www/web-pub2.nsf/$pid/CENMSFZS9TOS/$FILE/rozdily_ISO_EMAS.pdf)>
- Cenia. (2008) *Summary of cleaner production projects implemented between 1992 and 2006. Přehled projektů čistší produkce v období 1992 - 2006*. [online, accessed on 2010-11-04]. Available from: [http://www.cenia.cz/web/www/web-pub2.nsf/\\$pid/MZPMSFHODF0K/\\$FILE/Projekty%20CP.pdf](http://www.cenia.cz/web/www/web-pub2.nsf/$pid/MZPMSFHODF0K/$FILE/Projekty%20CP.pdf)
- Cenia. (2009). *EMAS Statistics for 2009. Statistika EMAS za rok 2009*. [online, accessed on 2008-03-04]. Available from: <[http://www.cenia.cz/web/www/web-pub2.nsf/\\$pid/CENMSFZSAHSJ/\\$FILE/2009.pdf](http://www.cenia.cz/web/www/web-pub2.nsf/$pid/CENMSFZSAHSJ/$FILE/2009.pdf)>
- CIR. (2004). *Situation Analysis on Ecodesign in the Czech Republic, Situační analýza o ekodesignu v České republice*, Innovation and Development Centre, Centrum inovací a rozvoje. [online, accessed on 2009-01-20], Available from: <<http://www.cir.cz/ekodesign/482664/1833650>>.
- Ekoznačení. (2003). *Eko-labelling Publication. Publikace*. MŽP, ISBN 80-7212-223-1, Prague [online, accessed on 2008-06-13] Available from: <[http://www.env.cz/osv/edice.nsf/AFE8148C8858BD4BC1256FF9003E2CD9/\\$file/EŠV.pdf](http://www.env.cz/osv/edice.nsf/AFE8148C8858BD4BC1256FF9003E2CD9/$file/EŠV.pdf)>
- Hyršlová, J. (2002). *Guideline for Implementation of Environmental Management Accounting. Metodický pokyn pro zavedení environmentálního manažerského účetnictví* Ministerstvo životního prostředí MŽP, Prague. [online, accessed on 2007-12-12], Available from: <<http://www.oldmzp.cz>>
- Jasch, Ch. (2002). *Environmental Management Accounting Procedures and Principles* Způsob určování hodnot pro environmentální manažerské účetnictví. Institute for Environmental Management and Economics. IÖW, Vienna. [online, accessed on 2007-12-12], Available from: <<http://www.ioew.at>>

- Klásterka, J., Růžička, P., Babička, L., Remtová, K. (2007). EMAS Systém environmentálního řízení a auditu - Příručka k Programu EMAS. Planeta, Vol. XIV., No 1/2007, p. 1-16, ISSN printed version 1801-6898 [online, accessed on 2010-03-04]. Available from: <[http://www.cenia.cz/web/www/web-pub2.nsf/\\$pid/MZPMSFJ1TY3H/\\$FILE/planeta1_korektura2.pdf](http://www.cenia.cz/web/www/web-pub2.nsf/$pid/MZPMSFJ1TY3H/$FILE/planeta1_korektura2.pdf)>
- Kožoušková, E. (2008). *Investment into Environment Conservation. Investice na ochranu životního prostředí.* Czech Statistical Office, Prague. [online, accessed on 2010-17-05]. Available from: <[http://www.czso.cz/csu/2008edicniplan.nsf/t/3D004C9D02/\\$File/200908c02.pdf](http://www.czso.cz/csu/2008edicniplan.nsf/t/3D004C9D02/$File/200908c02.pdf)>
- Remtová, K. (2003) - a. *Cleaner Production. Čistší produkce.* MŽP, ISBN 80-7212-260-6, Prague [online, accessed on 2008-11-04]. Available from: <<http://www.env.cz/osv/edice.nsf/e26dd68a7c931e61c1256fbe0033a4ee/820af3233682e83ec1256fc0004eaf10?OpenDocument>>
- Remtová, K. (2003) - b. *Eco-design. Ekodesign.* MŽP, ISBN 80-7212-230-4, Prague [online, accessed on 2008-06-08]. Available from: <<http://www.env.cz/osv/edice.nsf/da28f37425da72f7c12569e600723950/7907a38f19e1d57ec1256fc0004fe74d?OpenDocument>>
- Remtová, K. (2006). *Business Strategy for environment conservation, voluntary instruments. Strategie podniku v péči o životní prostředí, dobrovolné nástroje.* Oeconomica, ISBN 80-245-1086-3, Prague
- Růžička, P. (2002). *Relationship between EMS/EMAS and environmental management accounting. Vztah EMS/EMAS a environmentálního manažerského účetnictví.* Informace o projektu Chemas. MŽP, Prague [online, accessed on 2008-03-04]. Available from: <<http://www.env.cz/www/zamest.nsf/defc72941c223d62c12564b30064fdcc/a0f76376b58e1af1c1256d60003d56aa?OpenDocument>>
- Vlčková, J. (2004). *Eco-profit. Ekoprofit.* [online, accessed on 2008-11-04]. Available from: <http://www.ireas.cz/download/projekty/www_dns/priloha14.pdf>

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