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INFORMATION ASPECTS OF ASSESSING ENVIRONMENTAL POLICY IMPLEMENTATION EFFECTIVENESS: CASE OF THE CZECH REPUBLIC

The methodology for the ex-post evaluation of various environmental policies implemented in the Czech Republic was developed at the University of Economics, Prague. It was approved by the Czech Ministry of the Environment. The methodology covers the three pillars of sustainability - environmental, economic and social. The aim of this paper is to present information aspects of the methodology. It shows that, even if there are over 40 complex environmental information systems and over 100 databases in the Czech Republic, new policies must have well-defined goals and corresponding informational components designed to manage satisfactory ex-post assessment.

Keywords: environment; policy; information science; sustainable development.

JEL: Q5, H5, K32

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ІНФОРМАЦІЙНІ АСПЕКТИ ОЦІНЮВАННЯ ЕФЕКТИВНОСТІ РЕАЛІЗАЦІЇ ЕКОЛОГІЧНОЇ ПОЛІТИКИ: НА ПРИКЛАДІ ЧЕСЬКОЇ РЕСПУБЛІКИ

У статті наведено методологію оцінювання різних екологічних політик, упроваджуваних у Чеській Республіці, яка була розроблена в Університеті економіки в Празі. Вона була схвалена чеським міністерством охорони довкілля. Методологія охоплює всі три аспекти стійкого розвитку – екологічний, економічний і соціальний. Представлено інформаційні аспекти методології. Це показує, що навіть якщо в Чеській Республіці існує більше 40 складних екологічних інформаційних систем і більше 100 баз даних, нова політика повинна мати чітко визначену мету і відповідні інформаційні компоненти, призначені для ефективного подальшого аналізу.

Ключові слова: довкілля; політика; інформатика; стійкий розвиток.

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ИНФОРМАЦИОННЫЕ АСПЕКТЫ ОЦЕНКИ ЭФФЕКТИВНОСТИ РЕАЛИЗАЦИИ ЭКОЛОГИЧЕСКОЙ ПОЛИТИКИ: НА ПРИМЕРЕ ЧЕШСКОЙ РЕСПУБЛИКИ

В статье показана методология оценки различных экологических политик, внедряемых в Чешской Республике, которая была разработана в Университете экономики в Праге. Она была одобрена чешским министерством охраны окружающей среды. Методология охватывает все три аспекта устойчивого развития - экологический, экономический и социальный. Представлены информационные аспекты методологии. Это показывает, что даже если в Чешской Республике существует более 40 сложных экологических информационных систем и более 100 баз данных, новая политика должна иметь четко определенные цели и соответствующие информационные компоненты, предназначенные для эффективного последующего анализа.

Ключевые слова: окружающая среда; политика; информатика; устойчивое развитие.

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1. Introduction. In the recent decades we have witnessed a growing share of national and supranational resources being allocated to public policies. Not only is the growing share of resources considerable, also the impacts of the policies matter. The growing influence of public policies both on the resources available and the state of the economy, society, culture and environment has raised a demand for a sound assessment of the effectiveness of the policies implementation. Every assessment exercise has to be based on relevant information. Various effectiveness concepts require various informational and data inputs. The aim of this paper is to present the information and data requirements one has to fulfil in order to carry out a sound ex-post assessment of an environmental policy implementation. An official environmental policy effectiveness assessment methodology framework has been developed by Sauer et al. (2009a). 4 detailed applications of the methodology on various policies implemented in the Czech Republic have been made (Sauer et al., 2009b, Kaprova et al., 2010, Hadrabova, 2012). Based on the document analyses and the knowledge of the data contents and structure of Czech environmental information systems, we discuss the information aspects of such effectiveness assessment.

The paper is structured as follows: in the first part we introduce the methodological framework for the ex-post assessment of the environmental policy implementation effectiveness. A presentation of the stepwise methodology follows. In the next part the existing problems of the Czech environment-oriented information systems potentially suitable for the methodology are briefly described. The paper concludes with a discussion of the consequences raised by the application of the methodological framework for assessment of the policy implementation effectiveness.

2. Methodological Framework for Environmental Policy Implementation Effectiveness Assessment. Public environmental policies are mostly formalised by a document created and stipulated by a public body with the authority to influence specific trends and to pursue certain goals in the long and mid terms. Such a definition covers both official strategies and policies that the responsible public bodies prepare and issue, and legislative enactments adopted in order to implement these strategies and policies. The Czech environmental legislation is harmonized with the EU, where on average, 80% of the national environmental legal enactments originates from the *acquis communautaire* (Dimas, 2005).

Regardless the form and the origin of a policy, there are 3 basic types:

1. Public spending programmes. In the case of the Czech Republic, the national programmes of the State Environmental Fund or the Operational Programme Environment 2007-2013, which is largely financed by the European Reconstruction and Development Fund and the Cohesion Fund. None of these programmes, however, includes a claim or entitlement for a support.

2. Command & control programmes. The vast majority of the implemented legal acts is based on the command & control principle, where obligations, sanctions and other provisions needed for effective implementation are declared.

3. Entitlement programmes. This is a relatively new way of implementing certain goals. Mostly these programmes involve creation of an institution of transferable property rights to certain environmental services and subsequently institutional support to a market for these rights. The amount of property rights is usually limited in accordance with the overall goal of the policy. The other basic purpose of the pro-

gramme is to entitle someone to use environmental services, but also charge them with taxes or levies for the use.

These 3 types share some common factors, which are useful for effectiveness assessment. From the technical point of view these are namely goals, resources and instruments/measures. From a broader view of policy analysis, a factor of policy legitimacy could be added. The effectiveness from the technical point of view covers 3 main interpretations (Kreuz & Sauer, 2008; EEA, 2008; OECD, 2004):

The environmental effectiveness extent to which the goals of the policy were met - this is the basic efficacy of the policy, in the context of the environmental policy implementation the criterion is called “environmental effectiveness”.

The cost effectiveness of the resources spent to achieve the goals - this is the basic economic criterion of the policy implementation effectiveness, but there is a strong requirement for policy implementation modalities.

The economic effectiveness of the policy - extended economic criterion, which includes not only costs (both public and private) of policy implementation, but also the monetised (and exactly calculated) benefits. But even with the use of exact methods, we cannot measure these with absolute certainty (Mildeova, 1994).

There is also a third aspect of policy effectiveness, which incorporates the legitimacy of policy and the implementation authorities themselves. Policy implemented without public support cannot be regarded as effective (Offe, 1996; Ringen, 1987; Sabatier & Mazmanian, 1979; Miles et al., 2002). Table 1 below lists an adapted set of preconditions for an effective policy according to Sabatier & Mazmanian (1979). The absence of these prerequisites may be regarded as implementation deficit (Fox, 1991).

Table 1. Preconditions for an effective policy

	Element of policy implementation	Requirements
1	Goal of a policy	Outright, explicit and clearly defined.
2	Impact model	Decisions of key stakeholders and implementing agencies are based upon a recognized theoretical casual model.
3	Implementing structure	The implementing structure (resources, organization, measures) is well developed, the roles are clearly defined.
4	Motivation and involvement	Employees of the implementing agencies are both loyal and qualified.
5	Policy legitimacy	The policy is supported by all relevant stakeholders and interest groups.
6	Socioeconomic stability	Unstable socioeconomic development causes the growth of uncertainty of actions and effects.

Source: adopted from Sabatier & Mazmanian, 1979.

As indicated above, the policy implementation effectiveness assessment exercise must not be a trivial task in most cases. In the recent years, the Czech Ministry of the Environment has undertaken several steps to improve the regulation it is responsible for. First of all, new policies and regulations are subject to Regulatory Impact Assessment (RIA). Secondly, significant effort has been made to improve the measurability of the basic efficacy of the policies implemented.

3. Principles of the Methodology Developed. Multicriterial assessment is the main assessment method. It is carried out in 3 separate modules - environmental,

economic and sociol-institutional. The environmental module focuses on the basic efficacy of policy implementation. The economic module comprises an economic effectiveness criterion in the first order and a cost effectiveness criterion in the second order. The sociol-institutional module is concerned with the broader (mostly "soft") aspects. Examples of such "soft" criteria presented in connection with voluntary implementation of corporate social responsibility see Milosz (2012).

The methodology itself is a stepwise scheme. The steps are grouped into phases of assessment. Several decisions are made by the assessment elaborator. All the decisions have to be reasoned and documented. For details of the assessment procedure see Figure 1.

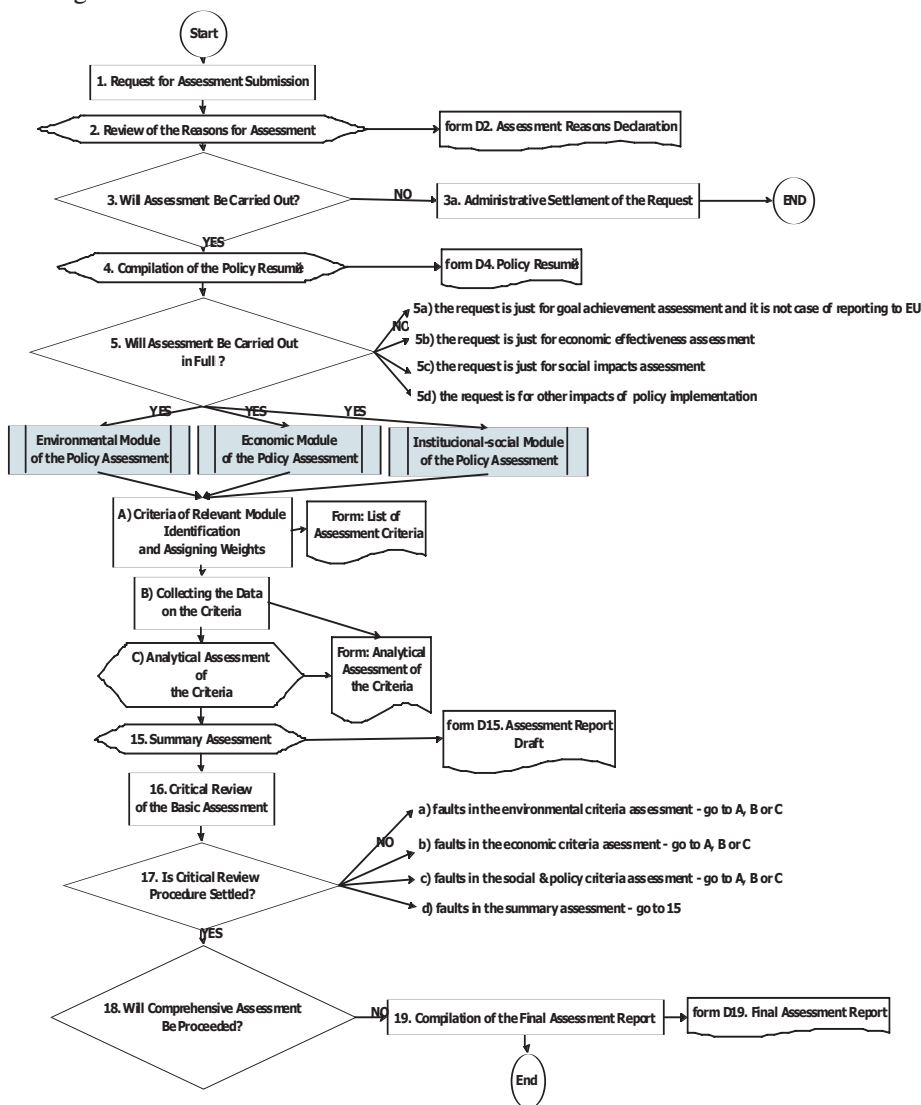


Figure 1. Methodology Assessment Procedure

Two principles are suggested to attain cost effectiveness of the assessment itself:

- 1) conditional two-staged assessment process;
- 2) best available data (BAD) principle.

The two-staged assessment process resembles the two-stage process in RIA. First, a simplified assessment is carried out. Only if suggested by the critical review of the simplified assessment, certain further steps of the assessment are elaborated within the so-called comprehensive assessment, which needs not to be of a complex character. The BAD principle rules that in case there are more data sources available, the data of the highest quality have to be used. The methodology suggests a simple rating of data quality (EMEP/EEA, 2009, part A/5).

In every sustainability module, the respective criterion set is first identified (for instance, for the case of air pollution - in the environmental module - the emissions of SO₂, NO_x, NH₃ could be selected). For each set of criteria weights are developed by a group of experts. Then the data collection follows. Based on the data and preprepared evaluation scales, experts assign points to the criteria and the final assessment is calculated with the weights.

Although all the effectiveness criteria are straightforward in their definition, and thus the data collection task should also be straightforward, one can encounter numerous problems. Now we would like to focus on the environmental effectiveness criterion, since it is a core of the assessment as a whole. For example, the cost effectiveness criterion has to be assessed in relation to true environmental results of policy implementation. Also the data for other than environmental criteria could be relatively easily calculated, estimated or collected from other official sources (e.g., the national statistic office). On the other hand, the data on the environmental performance of the policy assessed cannot be estimated so easily. In most cases there has to be an informational component in the implementing structure of the policy.

4. Informational Aspects of Environmental Effectiveness Assessment. In the Czech Republic there are many information systems containing data on almost all environmental components subject to existing environmental policies. Numerous information systems of various qualities have sprung up at the Ministry of the Environment and its allowance organizations. Although there are over 40 information systems and more than 100 databases on the environment in the Czech Republic, the data required to assess the environmental results of the policy implementation are not available directly or at all in many cases.

Historically, most of the existing information systems have primarily only served to monitor the administrative aspect of the policies. These information systems are the products to satisfy the demand of implementing authorities, not the demand of the public or the object of the interventions (environment, nature, air protection etc.). The most exemplary is the Environmental impact assessment information system or the Integrated prevention and pollution information system. These systems provide information for the public and policy analysis experts, but there are no data about the real performance of the policies. The number of permits issued or assessment reports does not provide any information about the environmental effectiveness of the policy. Such information systems are mostly established in order to administer command & control policies.

Then there are information systems with a structure and contents by which the real environmental performance of particular policies can be monitored. These are, for example the Registry of emissions from sources of air pollution administered by the Czech Hydrometeorological Institute, and the Information system on waste management administered by the Czech Environmental Information Agency. However, the waste management system, for instance, does not provide robust data. There has, simply put, been a discrepancy in the methodologies of data collection and reporting in several periods since the launch of the system. The system also suffers from the fact that the quality assessment and control of the data reported is rather poor. This is the problem sequent upon the quality of regulation. There are no specific rules about the subject obliged to report data on waste in order to assess and assure the quality of the reported data. And for the governmental organization there are little resources to evaluate and rectify the individual data reported. On the other hand, the air emission system can be regarded as one of the best-quality systems in the Czech Republic. The data series on emissions from individual sources have been produced for many years; in the event of a change in methodology, the discrepancies are corrected and the data from individual pollution sources are checked, assessed and corrected if needed.

Information systems like air emission registry or waste management system can be treated as hybrid systems in terms of their informational utilization in environmental effectiveness assessment. They also serve both command & control and entitlement policies (for air emissions both the emission concentration and total emissions per year are reported, whereas emission concentrations relate to command & control based regulations and total emissions to fee-based regulations). There is still a problem with assessment of the data from these hybrid systems. These problems do not relate to the relevant data collection deficits, but rather to the environmental policy assessment methodology. For example, the data on air emissions can be treated as being of high quality; however, one has to decide which part of the trends observed can be attributed to a particular air protection policy. In other words, there are various factors affecting air emissions and a particular policy is only one of them.

Another type of information systems covers very well the environmental effectiveness of a particular policy. In such a system the data collected directly relate to the quantified and clearly defined goal of the policy. The EU emission trading registry can be mentioned as an example. With growing experience with EU-based legislation (which is much more goal-based than the Czech one) the policy decision-makers have tried a few times to integrate environmental effectiveness indicators into the policies being reviewed or prepared. Shining examples are the public financial support programmes. The EU regional policy always requires including informational components in operational programmes. These components then have to be narrowly linked to the capability of programme effectiveness assessment.

However, this effort to integrate the informational components needed often interferes with the original purpose of an information system. In case an information system does not allow integration of the data inputs relating to environmental effectiveness, the first-hand solution is to establish a brand new system. This is the cause of the numerous information systems on environmental protection. There are currently 8 public waste databases and information systems, and several private waste-related databases in the Czech Republic. On the one hand, there is a growing pres-

sure for accountability, and policy goals are clearly defined and informational components needed are designed; on the other hand, the existing systems, due to their purpose and design, do not allow integrating these components.

The last type of information systems does not relate to a particular environmental policy, but rather to the informational policy of the Ministry of the Environment, and as such can be treated as irrelevant to effectiveness assessment. These types include the Integrated Registry of Emissions, Integrated system for fulfilment of reporting obligation etc. The former system simply collects data on emissions of the selected chemical substances to air, water and soil. The data cannot be attributed to a particular policy and thus only serve as a source of information for public about polluters in their neighbourhoods. These data are often accompanied by geographical data. The latter system, on the other hand, provides a unified interface for individual polluters. However, these systems are irrelevant for environmental policy effectiveness assessment.

5. Conclusions and recommendations. The governments nowadays increasingly realize their accountability for their interventions. Accountability would only be an empty word without information on the effects of these interventions. The methodology for environmental policy implementation effectiveness assessment is one of the tools designed to improve accountability. However, even in its core module, the environmental one, all the data needed for effectiveness assessment, are not available.

We have shown that the availability of data strongly depends on the type of policy. Whereas entitlement policies mostly incorporate the informational component needed for effectiveness assessment, command & control policies tend to omit this component. The emphasis shifts from environmental performance of the policy to the proper and substantial administration. With this purpose (proper and substantial administration) most information systems are run for command & control policies.

During a preparation phase of a new environmental policy it should be considered whether the design of the policy allows incorporation of environmental effectiveness indicators and relevant data collection methods. Furthermore, for the entitlement policies the informational component is usually the fundamental component needed for functioning of policy mechanisms.

Nowadays we witness dramatic efforts to consolidate information systems in the environmental area. However, these efforts are aimed mostly at integration of systems, not at their purpose. The expected positive effects of integration are unquestionably desirable. For the regulated subjects, authorities and public, integration can produce significant savings. However, these savings are generated only by an improvement to the structure of informational components. Future efforts should focus on particular informational components, whether they are needed, whether they generate data and information needed for policy implementation and whether a policy implementation is environmentally effective. Only the useful components then should be improved. The existing policies should also be reviewed with respect to accountability for their implementation.

Our conclusion is based on the analyses of numerous information systems. Within this set only a few allow obtaining data needed for policy effectiveness assessment. There is no doubt that the systems should serve public authorities; however, public authorities exist and act in order to implement environmental policies. The

effectiveness of policies without a well-defined goal and without a corresponding informational component cannot be assessed.

6. Acknowledgements. This paper has been supported with FMV IGA grant no. F2/5/2012.

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Стаття надійшла до редакції 26.07.12