



FUNDING OF CRITICAL INFRASTRUCTURE

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Summary: *The paper deals with the subject – funding of critical infrastructure. The very important for EU member states is the current situation in critical infrastructure funding. There are described current as well as proposed mechanisms of critical infrastructure funding.*

1. Introduction

One of the government's functions is to protect and secure its citizens. Globalization, increasing independence and complexity, new technologies and climate change create new challenges for the government and its approach to security policy. To safeguard security the idea of critical infrastructure was invented. The concept of critical infrastructure (CI) is based on the critical elements, assets and interrelations among them. The functionality of this system is essential for State security and for the fulfillment of vital State functions. The concept of the CI has its political, social and economic dimensions.

2. Critical infrastructure

In Europe the agenda of the critical infrastructure and its protection was adapted by the European Commission Green Paper for the first time in 2005. This document defined the critical infrastructure as follows: "Critical infrastructures consist of those physical and information technology facilities, networks, services and assets which, if disrupted or destroyed, would have a serious impact on the health, safety, security or economic well-being of citizens or the effective functioning of governments in the member states. Critical infrastructures extend across many sectors of the economy, including banking and finance, transport and distribution, energy, utilities, health, food supply and communications, as well as key government services. Some critical elements in these sectors are not strictly speaking 'infrastructure', but are in fact, networks or supply chains that support the delivery of an essential product or service." [1]

The Critical Infrastructure Assurance Office (CIAO): CI is...,the framework of interdependent networks and systems comprising identifiable industries, institutions (including people and procedures), and distribution capabilities that provide a reliable flow of products and services essential to the defense and economic security of the USA, the smooth functioning of governments at all levels, and society as a whole". [4]

The Act Nr. 45/2011 on critical infrastructure was approved in the Slovak Republic. It provides a definition of critical infrastructure elements as follows: “Disruption or destruction of civil engineering building, service in the interest of public and information system in the sector, having potentially serious adverse consequences or the conduct of economic and social functions of the Country, and thereby the impact on the quality of life, protection of life, health, safety, property and environment according the sector criteria and cross-cutting criteria.” [3]

Critical infrastructure can be characterized:

- it consists of assets, products, services,
- consequences of its dysfunctions have extreme impact on the whole society (economic and socio-political environment),
- it is a network of assets, products or services, whose activities, performance act in the network of interrelations.

The key drivers and trends of critical infrastructure in the Slovak republic are:

- the infrastructure is owned and managed by public and private sectors and the average age of structures increases,
- the cooperation between private sectors and state organizations is the challenge for the future; only cooperation can fulfill objectives and increase security,
- the improvement, investments and maintenance costs are rising,
- the government is financing critical infrastructures – it is seen as the state objectives but the financial sources tend to be more and more limited,
- the cyber sphere started to be the most critical part of the infrastructure
- cultivate dialogue between CI providers and government to develop protection programs,
- functionality of critical infrastructure is also determined by climate change and technological innovations.

3. Economic analysis and its application in critical infrastructure

The overall approach of economic analysis of critical infrastructure is based on risk management framework. It therefore consists of the following steps:

- identification of critical assets,
- risk identification,
- measurement of risk,
- risk mitigation,
- communication.

The content of the step identification is performed on the State or EU level – according to the predefined criteria.

General definition of risk is:

$$(1) \quad Risk = probability \times impact$$

Risk level can be determined quantitatively or qualitatively. Quantitative approach is based on exact evaluation of probability of the analyzed event or series of events. The application of Exceedence probability for a given loss EP (Li) is one of the approaches. There is also a class of approaches that are based on the ad hoc data – specific for the analyzed problem. Qualitative approach is based on the subjective estimation of probability = likelihood. The non existing data or problems with exact method to be applied are the common reason for relevance of this approach.

Risk mitigation is the following step. Within this step are prioritized actions, conducted cost benefit analysis and assigned responsibility of personnel. This step is about economic analysis and risk tolerance – the objective is to apply measures that efficiently mitigate analyzed risk; the risk should be within pre-defined risk tolerance. Cost benefit analysis is simply based on the ratio between benefits and costs. If the result is greater than one, than the investment linked with risk mitigation is preferred. Other measure applied within risk management framework is called Return on investment (ROI), what is the ratio between net benefits (total benefits minus total costs) to total costs. The specific ratios based on this definition are Return on Security Investment (ROSI) or Return on Critical Infrastructure Protection Investment (ROCIPI).

The problem can be split to the following frames:

1. identification of relevant security measures,
2. installment of measures to mitigate the risk to an acceptable level,
3. economic analysis of the investment (cost benefit analysis or other measures).

4. EU – Critical Infrastructure funding

Operating the critical infrastructure requires partnership of the public administration and the private sector because a large number of objects are owned by companies. It is desirable for the owners and operators of the critical infrastructure objects but also the government to participate in financing the critical infrastructure through the financial contributions from the state budget and the bodies and institutions of the European Union as well.

Financing the critical infrastructure in the *Slovak Republic* is amended by the law No. 45/2011 Coll., about the critical infrastructure where the article 9 says: “The operator is entitled to a financial contribution for fulfilling the duty connected with carrying out the safety measures for protecting the infrastructure according to the article 10 (Security Plan) against the central body in the area of the critical infrastructure the operator belongs to if the central body determines it to the operator and this duty does not result from another generally binding legal regulation. The rules for providing a financial contribution will be determined by a special directive issued by the competent central body”. [3]

For financing the critical infrastructure protection of European importance it is possible to utilize also the means of the European Union which are programme-bound. Currently in connection with infrastructure three programmes are active.

During 2007 – 2013 the national, regional and local bodies can submit projects for improving the security and operation of the critical infrastructure from the framework programme Security and Safeguarding Liberties where a specific programme - Prevention, Preparedness and Consequence Management of Terrorism – is stated. Another possibility for acquiring financial means for financing the critical infrastructure is the programme – Fight against Terrorism – from which more than two thirds of the means for financing the European Programme on Critical Infrastructure Protection stem. Besides programmes that are mainly oriented on the protection and security of the critical infrastructure it is also possible to use the means from the programme Trans-European Networks (TEN) serving for building the transport network (TEN-T), the energy network (TEN-T) and the telecommunication network (eTEN).

The Security belongs to the one of the EU objectives. EU Internal Security Strategy (in 2010) focuses on the following strategic objectives:

- prevention of cross-border, serious and organized crime and fight against it,
- prevent terrorism, radicalization and recruitment,

- increase the capacity for critical infrastructure protection across all economic sectors,
- increase the resistance of Europe to crisis and disasters. [2]

With the objective to improve safety there is a proposal (working document) to establish Fund for interior security in EU for years 2014-2020. Financial sources allocated for the Fund will be 1 128 mil.€ for this period. The sum will be split in ratio 50/50 for member states and EU authority – it means 564 mil.€ will be delivered to member states to support national programs and measures of EU. EU will apply the rest (50%) for the measures within direct or indirect subsidies.

5. Conclusion

Financing the operation and recovery of the critical infrastructure represents a complex problem which is not currently solved in a complex way both in the Slovak Republic. In the future it will be necessary to work out a system for acquiring the financial means and their distribution based on in advance stated and clear criteria which would be a legal framework both on the national and European level.

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