

Risk in Public-Private Partnerships and Critical Infrastructure

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The process risk allocation is essential for effective PPP contracts, depending on the scope of defined tasks and responsibilities between the parties in their quest to deliver public services. However, risk in critical infrastructure is sui generis risk which could not be treated contractually and transferred by the public sector to the private sector or retained by the party to an arrangement which is suited best to borne such risks.

Risk in critical infrastructure, being either internal or external, is endemic to the relevant services and when critical infrastructure is delivered by public-private partnerships or owned by private actors, the treatment of such risk merits a third-party approach. Such third-party could be an industry in itself, such as insurance, re-insurance or hedge fund insurance bond finance, or a sector / industry approach which related to the owners/operators of the relevant infrastructure, by means of collective apportioning and mitigation of risks associated with the failure of providing services from such infrastructure. The most innovative way of treating risk of critical infrastructure remains in the discretion of EU Member States, in the form of integrating costs related to risk assessment and security measurers to protect critical infrastructure into tariff arrangements of relevant services. In such manner, the end-user / consumer of services ensures and collectively insures their delivery against any type of risk which is not quantified and determined as part of corporate arrangements between the state and the private sector provider of services.

I. Introduction

Public-private partnerships denote a sophisticated interface between public authorities and private sector undertakings, which aims at delivering infrastructure projects, as well as public services.¹ According to the EU institutions, the term public-private partnership refers to “forms of cooperation between public authorities and the world of business which aim

to ensure the funding, construction, renovation, management or maintenance of an infrastructure or the provision of a service.”²

At the European level, as part of the Initiative for Growth, the Council has approved a series of measures designed to increase investment in the infrastructure of the trans-European transport networks and also in the areas of research, innovation, and development,³ as well as the delivery of services of general interest.⁴

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1 See European Commission, Report to the Laeken European Council: Services of General Interest, COM (2001) 598; European Commission, Communication from the Commission to the Council, the European Parliament, the Economic and Social Committee and the Committee of the Regions on the Status of Work on the Examination of a Proposal for a Framework Directive on Services of General Interest, COM (2002) 689; European Commission, Green Paper on Services of General Interest, COM (2003) 270; European Commission, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the

Regions: White Paper on Services of General Interest, COM (2004) 374.

2 See European Commission, Green Paper on Public-Private Partnerships and Community Law on Public Contracts and Concessions, COM (2004) 327.

3 See Conclusions of the Presidency, Brussels European Council, 12 December 2003, COUNCIL OF THE EUROPEAN UNION, Brussels, 5 February 2004, 5381/04. See Communication from the Commission to the Council and to the Parliament “Public finances in EMU 2003,” published in the European Economy No 3/2003 (COM (2003) 283 final).

4 See COM (2003) 270.

The United Nations (UN) followed suit and embraced the concept, defining public private partnerships as:

“Innovative methods used by the public sector to contract with the private sector, who bring their capital and their ability to deliver projects on time and to budget, while the public sector retains the responsibility to provide these services to the public in a way that benefits the public and delivers economic development and an improvement in the quality of life.”⁵

The UN devised a blueprint to close the gap between the poorest countries and industrialized nations in the UN Millennium Declaration, committing its members to a new global partnership and emphasizing the potential of public-private partnerships in achieving the realization of the United Nations Millennium Development Goals.⁶

II. The Concept of Risk in Public-Private Partnerships

The principal benefit from involving the private sector in the delivery of public services has been attributed to the fact that the public sector does not have to commit its own capital resources in funding the delivery of public services, whereas other benefits include quality improvement, innovation, management efficiency, and effectiveness, elements that are

often underlying private sector entrepreneurship.⁷ Consequently, the public sector receives value-for-money in the delivery of public services, while it can also be maintained that through this process the state manages in a better, more strategic way the public finances. Value for money denotes a concept which is associated with the economy, the effectiveness and the efficiency of a public service, product or process, i.e., a comparison of the input costs against the value of the outputs and a qualitative and quantitative judgment of the manner in which the resources involved have been utilized and managed.⁸

The erosion of confidence in the role of the public sector as organizer and asset holder in the sphere of public services has led to attempts to moderate the widespread dissatisfaction from traditional public procurement methods in delivering public services and infrastructure projects.⁹ The outcome revealed that the nexus of contractual relations between public authorities and the private sector were not providing genuine value-for-money outcomes.¹⁰ The criticism has been primarily directed towards: (i) adversarial contractual relations as a result of competitive tendering, (ii) inappropriate risk allocation, and (iii) poor contractual performances resulting in delayed and over-budget completions.¹¹

Public-private partnerships possess some distinctive characteristics, when compared with traditional public-private contractual formats. These characteristics reveal a different ethos in public sector management. The pivotal characteristic is that the private sector partner is expected to play a strategic role in financing and delivering the infrastructure project or the public service by providing its input into the various phases such as the design, implementation, construction, completion, operation and maintenance stages of the project. As a result, the duration of the relations between public and private sectors must reflect the need for longevity, in order to allow affordability for repayment on the part of the public sector and also the ability of the private sector to recoup its investment profitably. Another characteristic that complements both the strategic role of the private sector and its long-term engagement in delivering infrastructure and public services reflects on the distribution of risks between the public and private sectors and on the expectation that the private sector will assume substantial risks. Risk assessment in PPPs is a totally different exercise than

5 See United Nations Economic Commission for Europe, *Guidebook on promoting Good Governance in Public Private Partnerships*, ECE/CECI/4, United Nations, 2008.

6 Citation needed for UN Millennium Declaration.

7 See P. Grout, *The Economics of the Private Finance Initiative*, in 13 *Oxford Review of Economic Policy* 53–66 (1997).

8 See J. Kay, *Efficiency and Private Capital in the Provision of Infrastructure*, in *Infrastructure Policies for the 1990s*, Organization for Economic Co-operation and Development (1993).

9 See Christopher H. Bovis, *Public-private partnerships in the 21st century*, ERA Forum: Volume 11, Issue 3 page 379, Springer, (2010).

10 In its policy statement, *Public Sector Comparators and Value for Money*, February 1998, the HM Treasury Taskforce in the United Kingdom set out the role of comparators in public procurement, stressing the importance of the value-for-money principle. The comparators are indices that help to distinguish between the lowest cost and the best value for money for public authorities and also their uses as an exercise of financial management and a means of demonstrating savings to public authorities.

11 See Christopher H. Bovis, *PUBLIC PROCUREMENT: CASE LAW AND REGULATION*, Oxford University Press, Chapter 11, 594 (2006).

the assessment of risk in traditional public contracts¹².

A range of different risks¹³ feature in PPPs: *construction or project risk*, which is related to design problems, building cost overruns, and project delays; *financial risk*, which is related to variability in interest rates, exchange rates, and other factors affecting financing costs; *performance risk*, which is related to the availability of an asset and the continuity and quality of the relevant service provision; *demand risk*, which is related to the ongoing need for the relevant public services; and *residual value risk*, which is related to the future market price of an asset. Finally, political risks cover a general term used to describe risks arising from external or internal factors that are determined or influenced by governments. External political risks, such as currency convertibility, war, sanctions, political instability may be avoided, mitigated, hedged, or insured against and could be significantly mitigated by actions of the state within which the PPP is structured. On the other hand, internal political risks, such as taxation, terrorism, inflation, and industrial unrest are usually uninsurable and could affect the risk allocation within PPPs. Their respective mitigation would potentially reflect on the perceptions of the parties to manage such risks.

Another essential dynamic of PPPs is that the private sector provides the financing. PPP financing is specialized financing which is different from both public finance and corporate finance. The PPP debt financing is regarded as off-balance sheet borrowing, which means that the borrowing does not affect the state's public sector borrowing requirements and any measurements or calculations of measures of its indebtedness. PPPs allow the public sector to access alternative sources of capital.

PPP's seek to transfer risk from the public sector to the private sector. Whilst the provision of private capital and the strategic involvement of the private sector partner in managing the delivery of public services could prove beneficial, significant risk transfer from the public to the private sector is necessary to derive a genuine value-for-money partnership. The impact of risk transfer on financing costs and the pricing of risk to ensure efficient risk transfer are crucial in understanding how risk is treated within public-private partnerships. The cost of capital needed to finance a public-private partnership depends only on the characteristics of project related

risks and not on the source of finance. However, the source of financing can influence project risk depending on the maturity and sophistication of the risk bearing markets. On the one hand, within advanced risk bearing markets, it is irrelevant whether project risk is borne by the public sector or the private sector. On the other hand, when risk bearing markets are less developed, project risk depends on how widely that risk is spread. Since the public sector can spread risk across taxpayers in general, the usual argument is that this gives the public sector an advantage over the private sector in terms of managing risk. Nevertheless, the private sector can spread risk across financial markets. The outcome is likely to be that project risk is lower in the private sector. The public sector's ability to forcibly spread risk across taxpayers, while financial markets have to be provided with an incentive to accept risk, may put the private sector at more of a disadvantage as far as large and risky projects are concerned. The scope for the private sector to spread risk will also be somewhat limited in countries with less developed financial markets. This outcome might contravene the assumption that private sector borrowing generally costs more than government borrowing. However, this mainly reflects differences in *default risk*. The public sector's power to tax reduces the likelihood that it will default on its debt, and the private sector is therefore prepared to lend to the public sector at close to the risk-free interest rate to finance risky projects. The crucial issue is whether PPPs result in efficiency gains that offset higher private sector borrowing costs¹⁴.

Risk transfer from the public sector to the private sector has a significant influence on whether a PPP is a more efficient and cost-effective alternative to public investment and publicly funded provision of services. The public sector and the private sector typically adopt different approaches to pricing market risk. The public sector tends to use the social time preference rate (STPR) or some other risk-free rate to discount future cash flows when appraising

12 See D. Moss, *When All Else Fails: Government as the Ultimate Risk Manager*, Harvard University Press, 2002.

13 See H. Polackova-Brix, and A. Schick, eds., *Government at Risk: Contingent Liabilities and Fiscal Risk*, World Bank, Oxford University, 2002.

14 See K. Arrow and R. Lind, *Uncertainty and the Evaluation of Public Investment Decisions*, [1970], *American Economic Review*, Vol. 60 (June), pp. 364–78.

projects. The private sector in a PPP project will include a risk premium in the discount rate it applies to future project earnings, where under the widely used capital asset pricing model (CAPM), the expected rate of return on an asset is defined as the risk-free rate of return plus a risk premium, the latter being the product of the market risk premium and a coefficient which measures the variance between the returns on that asset and market returns.

III. Assessing the Transfer of Risk in Public-Private Partnerships

Some broad and generic criteria have been devised to assess the degree of risk and its transfer involved in PPPs. Where PPP contracts do not provide a basis upon which risk can be assessed and subsequently transferred, the rule of thumb is derived from the distinction between ownership and operation of assets of the PPP. Two types of PPPs emerge: separable PPP contracts, where there is a clear distinction between asset ownership and delivery of public service elements, and non-separable PPP contracts, where the private sector partner is also the owner of an asset necessary to deliver the relevant services¹⁵.

For non-separable PPP contracts, the base line for the assessment rests on the balance of demand risk and residual value risk borne by the public sector and the private operator. Demand risk, which is an operating risk and is the dominant consideration, is borne by the public sector if service payments to a private operator are independent of future need for the service. Residual value risk, which is an ownership risk, is borne by the public sector if a PPP asset is transferred to the public sector for less than its true residual value. Residual value risk is borne by the public sector because the private operator reflects the difference between the expected residual value of the asset and the price at which the asset will be transferred to the public sector in the price it charges the public sector for services, or the revenue the public sector receives from a project. If the asset ends up being worth more or less than the

amount reflected in the service payment or government revenue, any resulting gain benefits the public sector and any or loss is borne by the public sector. Reference can also be made to various qualitative indicators, including government guarantees of private sector liabilities, and the extent of government influence over asset design and operation. The final conclusion is a judgment based on all relevant factors.

For separable PPP contracts, the risk assessment and subsequent transfer is based upon three constituent elements of risk: the construction of an asset or infrastructure, its availability to the end-user and the future demand for the service which is derived from the relevant asset or infrastructure. Construction risk covers events such as late delivery, low standards, additional costs, technical deficiency, and external negative effects. If the public sector makes payments to the private partner irrespective of the state of the asset, this indicates that the public sector bears most construction risk. Availability risk relates to the ability of the private partner to deliver the agreed volume and quality of service. Public sector payments to the private partner that are independent of service delivery indicate that the public sector bears most delivery risk. Demand risk covers the impact of the business cycle, market trends, competition, and technological progress on the continued need for the service. Public sector payments to the private partner that are independent of demand indicate that the public sector bears most demand risk. Changes in demand due to changes in government policy are excluded.

The European Union has provided guidance on the classification of PPP assets based on risk transfer. Eurostat has issued a Decision¹⁶ which says that a private partner will be assumed to bear the balance of PPP risk if it bears most construction risk, and either most availability risk (which is also referred to as performance risk) or most demand risk. The Eurostat Decision covers long-term contracts in areas where the private partner builds an asset and delivers services mainly to the public sector. Eurostat recommends that assets involved in public-private partnerships should be classified as non-government assets, and therefore recorded off balance sheet for government, if both of the following conditions are met: i) the private partner bears the construction risk, and ii) the private partner bears one of either availability or demand risk.

15 See International Financial Reporting Interpretations Committee (IFRIC), 1999, Consolidation-Special Purpose Entities, Standing Interpretation Committee (SIC) 12, 1999, Washington.

16 See Eurostat, (Statistical Office of the European Communities), press release STAT/04/18 of the 11th of February 2004.

IV. Externalization of Public Services and Infrastructure

The level of contractual complexity tends to increase substantially in contracts related to PPPs for infrastructure, because of risk allocation, duration and financing. The real world is certainly much more complicated than any theoretical framework. When risks are identified and allocated in contract documents those risks must be described. It is not always easy or possible to describe a risk in concise language. The parties may also have different ideas about what a particular risk actually means. For example a private service provider may insist that a force *majeure* risk (literally a risk outside the control of either party) may include both natural disasters and civil unrest whereas the government may wish to exclude civil unrest from this definition. Similarly many risk sharing mechanisms use wording such as “material” and “reasonable”. The meanings of these terms may be unclear. Additionally, parties may have different views regarding their ability to “control and manage” risks. The use of qualified experts, including engineers, is necessary to develop a true understanding of many risks and the options available to control or mitigate them. Finally, the depth and maturity of the market for private infrastructure will influence the participants’ views regarding risk. Private investors are particularly risk averse when industries are new and there is a lack of experience. They will tend to either refuse to accept certain risks, or will charge excessive risk premiums in order to take them.

PPP contractual arrangements are in effect complicated due to long-term contractual obligations and multiparty involvement. Managing risk, however, has been evolving as a major aspect in the provision of public services through partnership arrangements each having their associated benefits, risks and costs. Public and private social actors must decide which contractual arrangement – or mix of contractual arrangements – has the greatest likelihood of helping the partnership carry out its core strategy and strike an optimal balance between value creation goals and related risks, and efficiently and effectively deploys resources in pursuit of the entity’s objectives. In so doing, it becomes most important that all contractual parties identify, analyze and assess risks and develop plans for handling them early on. In this vein, responsibility should be also be allocated to the party best placed to manage the par-

ticular risk in question. In actuality, PPP entities, both from public as well as the private point of view, come to face uncertainty, and the challenge for management is to determine how much uncertainty to accept as it strives to create stakeholder value. This may involve negotiating suitable contractual arrangements, while it is reassuring to note that the costs incurred in risk management are commensurate with the importance of the procurement activity and the nature and magnitude of risks involved. Uncertainty presents both risk and opportunity, with the potential to erode or enhance value. In effect, risk tends to become a problem only when is mismanaged, misunderstood, mispriced or unintended.

One of the most advanced Public-Private Partnerships (PPP) programs has been developed in the United Kingdom¹⁷ which delivers approximately about 24% of public investment mostly in infrastructure.¹⁸ Many continental European Union states, including Ireland, Sweden, Finland, Germany, Greece, Italy, the Netherlands, Portugal, and Spain, have developed legal and policy frameworks to deliver PPP projects, although their share in total public investment is between five and fifteen percent. Reflecting a need for infrastructure investment on a large scale, and weak fiscal positions, a number of countries in Central and Eastern Europe, including the Czech Republic, Hungary, and Poland, have embarked on PPPs.¹⁹

Other countries in the world with significant PPP programs include Canada, Japan, and Australia, in particular the state of Victoria.²⁰ PPPs in most of the above countries focus on road infrastructure projects, while the United States has considerable experience with leasing programs in the delivery of public services.²¹ Mexico and Chile have pioneered the use of PPPs to promote private sector participation in pub-

17 See HM Treasury, *Public Private Partnerships: The Government’s Approach* (2000). See also, HM Treasury, *PFI: Meeting the Investment Challenge* (2003).

18 See L. De Pierris, *Improving the Infrastructure*, 40 *PFI Journal* 44–45 (2003).

19 See M. Spackman, *Public-Private Partnerships: Lessons from the British Approach*, 26 *Economic Systems* 283–301 (2002).

20 See Department of Treasury and Finance, *Partnerships Victoria* (Melbourne), (2000). See also, Department of Treasury and Finance, *Practitioners’ Guide-Guidance Material* (2001).

21 See, Office of Management and Budget, *Preparation, Submission, and Execution of the Budget*, OMB Circular No. A-11 (2002).

lic investment projects in South America. In Mexico, PPPs were first used in the 1980s to finance highways and, since the mid-1990s, a growing number of public investment projects in the energy sector. There are plans to extend the use of PPPs to the provision of other public services. Chile has a well-established PPP program that has been used for the development of transport, airports, prisons, and irrigation. Brazil is planning significant use of PPPs and there is also a regional approach to infrastructure development across the countries in South America. PPPs have also emerged in Asia, especially in India, Korea, and Singapore, and there is strong interest in PPPs in South Africa.²²

V. Critical Infrastructure and Risk Assessment

Traditionally the role of the state has been as the conduit for providing public services.²³ The term *public services*, which often refers to services that are offered to the general public, highlights that a service has been assigned a specific role in the public interest, or refers to the ownership or status of the entity providing the service. In the latter situation, public service fuses with the concept of *public sector*, which

covers the state and its organs, bodies governed by public law and undertakings controlled by public authorities. Two models for the treatment and regulation of public services have been developed based on different theoretical and conceptual values. One model theorizes that public services capture the general needs of the public and are delivered through external market-based mechanisms, whereby the public sector interfaces or competes with private sector undertakings; by contrast, other models describe public services as being essential facilities (for example defense, policing) which should be sheltered from competition in order to ensure the integrity of their delivery.²⁴

The offering of public-private partnerships has been seen as a credible solution to bridge the *infrastructure deficit* of many states in both the developed and developing world. The infrastructure deficit reflects the gap between existing levels of assets and service networks and the need and expectation of the citizens and the society at large for public services. The technical complexity and the enormity of investment for public service networks, the chronic underinvestment by states in infrastructure and the constant budgetary constraints imposed on contemporary governments appear as valid reasons for engaging the private sector in the delivery of public services and the relevant infrastructure.

The Stockholm Programme²⁵ and the EU Internal Security Strategy²⁶ have identified that critical infrastructure protection (CIP) must ensure that services vital to the society continue to function by increasing their resilience against all threats and hazards. An EU critical infrastructure is an “*asset or system located in Member States which is essential for the maintenance of vital societal functions, health, safety, security, economic or social well-being of people, and the disruption or destruction of which would have a significant impact in a Member State as a result of the failure to maintain those functions*”.²⁷

VI. The European Critical Infrastructures Directive

In an attempt to co-ordinate efforts to quantify risk in critical infrastructure which cannot be contained in any contractual relation between the state and the providers of the services related to the relevant critical infrastructure, The European Critical Infrastruc-

22 See D. Grimsey and M. Lewis, *Public Private Partnerships: The Worldwide Revolution in Infrastructure Provision and Project Finance* (2007).

23 See Christopher H. Bovis, *The State, Competition and Public Services*, in *The European Union Legal Order after Lisbon* 137 (Patrick Birkinshaw and Mike Varney eds., 2010); L. Flynn, *Competition Policy and Public Services in EC Law after the Maastricht and Amsterdam Treaties*, in *Legal Issues of the Amsterdam Treaty 196–97* (D. O’Keefe & P. Tworney eds., 1999). ; J. L. Buendia Sierra, *Exclusive Rights and State Monopolies under EC Law 330* (1999); A. Moriceau, *Services d’intérêt économique général et valeurs communes*, 519 *Revue du Marché Commun et de l’Union Européenne* 358 (2008); M. Ross, *Article 16 E.C. and Services of General Interest: From Derogation to Obligation?*, 1 *European Law Review* 22–38 (2000).

24 See T. Prosser, *The Limits of Competition Law* (2005); see also C. Graham, *Essential Facilities and Services of General Interest*, in *Diretto e Politiche dell’Unione Europea* 29 (2007); W. Sauter, *Services of general economic interest and universal service in EU Law*, *European Law Review*, Vol. 33 No2, 172 (2008).

25 See Conclusions of the European Council of 10/11 December 2009 on “The Stockholm Programme—An open and secure Europe serving and protecting citizens (2010–2014)”; 17024/09.

26 See The EU Internal Security Strategy in Action: Five steps toward a more secure Europe, COM (2010) 673 final.

27 See Council Directive 2008/114/EC of 8 December 2008 on the identification and designation of European critical infrastructures and the assessment of the need to improve their protection, *Official Journal of the European Union*, L345/75.

tures Directive 2008/114/EC purports to identify and designate European critical infrastructures and assess the need to improve their protection. The Directive has forced Member States to establish a process to identify and designate European critical infrastructures in the energy and transport sectors²⁸. However, this process reflects on a sector-focused approach which in itself is the major challenge for Member States, as the criticalities of infrastructure do not recognise sectoral boundaries. The Directive has mainly encouraged bilateral engagement of Member States instead of a pan-European forum for risk assessment and regulation in critical infrastructure.

The Directive has encouraged policies for the protection of national critical infrastructures and the improvement of security which has resulted in concrete actions such as the creation of specific national bodies to deal with critical infrastructure protection policies. In the energy sector, despite of the fact that main energy transmission networks are not included, there has been progress in putting in place both risk management and protection measures in cooperation with operators. This development reflects the major development of a cross-sectoral approach to risk in critical infrastructure. Operators of critical infrastructures, including those operating in the energy and transport sector, would, fall under the risk management and incident reporting requirements of the proposed Directive on Network and Information Security²⁹, thus creating a “system” or “service” approach of critical infrastructure protection.

A “system” or “service” approach of critical infrastructure protection reveals a different dimension on the problem. Risks which are related to the critical infrastructure protection could be internal or external to that infrastructure, the latter including material and IT assets, networks, services, and installations that, if disrupted or destroyed, could or would have a serious impact on the health, security, or economic well-being of citizens and the efficient functioning of the state.

If risks are internal to the infrastructure, the contractual arrangements between the state and the provider of the infrastructure can accommodate risk identification, treatment and subsequent management. The mechanism of risk transfer is the major instrument which calibrates the relation between the state and the operator of the infrastructure (of-

ten a PPP) and provides for a resolution of internal risks.

If risks are external to the infrastructure, they touch upon structural threats as well as by intentional, actor-based attacks³⁰ and distinguish between two types of risk categories; on the one hand, risks emanating from unforeseen natural catastrophes and on the other hand, risks emerging from human-induced disasters, including an extensive spectrum of external actor involvement ranging from cyber threats, organized crime, religious fanaticism, terrorism, unruly, disaffected or dissatisfied individuals.

In relation to risk assessment and risk management methodologies for critical infrastructure protection, the European Commission has encouraged the development of individual/sectoral approach³¹ and in particular, the development of a risk assessment methodology to enhance security awareness in air traffic management; the assessment of resilience to threats to control and data management systems of electrical transmission networks; and an interactive risk assessment in the critical infrastructure field based on earth observation data and an integrated geographic information system³². The individual/sectoral approach of risk assessment and risk management methodologies for critical infrastruc-

28 Council Directive 2008/114/EC of 8 December 2008 on the identification and designation of European critical infrastructures and the assessment of the need to improve their protection, Official Journal of the European Union, L345/75.

29 COM(2013)48.

30 See E. Brunner, M. Suter, "The International CIIP Handbook 2008/2009.-An Inventory of Protection Policies in 25 Countries and 6 International Organizations", Centre for Security Studies, Zurich, 2008.

31 The European Union Programme for European Critical Infrastructure Protection (EPCIP) for energy, transportation, and finance focuses on four main areas:
a) the creation of a procedure to identify and assess Europe's critical infrastructures and learn how to better protect them. This procedure was established for the energy and transport sectors in the Identification of European Critical Infrastructures Directive; b) measures to aid protection including expert groups at EU level and the creation of the Critical Infrastructure Warning Information Network (CIWIN) – an internet-based communication system for exchanging information, studies, and best practices; c) funding for over 100 critical infrastructure protection projects between 2007 and 2013. These projects focused on a variety of issues including national and European information sharing and alerting systems, the development of ways to assess interdependence between ICT and electricity transmission networks, and the creation of a “good practices” manual for policy makers; d) international cooperation with European Economic Area (EEA) and European Free Trade Area (EFTA) countries, as well as expert meetings between the EU, USA, and Canada.

32 See European Commission, Staff Working Document, Brussels, 28.8.2013, SWD(2013) 318 final.

ture protection has identified a major deficiency where critical infrastructures are not treated as an interconnected network³³.

A uniform and converged playing field on security at European level indicates the need for states, owners and operators of critical infrastructure to share information, data and systems in order to ensure efficient and secure operations at all times. In particular, for energy infrastructure, it is necessary to be subject to both European and national legislation and risk assessment to determine its criticality, reflecting its strategic importance. The costs related to risk assessment and security measures to protect critical infrastructure need to be integrated into EU Member States' tariff arrangements³⁴.

VII. Conclusions

Technically, every PPP project is a long-term arrangement of transfer of risks which are traditionally borne by the public sector to the private sector for which the latter is financially compensated for the willingness to bear the risks. PPP is an effective approach to enhance project productivity by bringing in management efficiency and creative skills from business practice, and reducing governmental involvement by using private sectors in the provision of public services. A PPP contract apportions the project-associated risks mainly to public and private sector. Best practice suggests an optimal rather than a maximum risk transfer from the public to private sector. A problem may, however, occur if risk is inappropriately transferred, as the government may pay a premium higher than necessary or jeopardize the long term sustainability of a PPP arrangement or is merely gaining the illusion of risk transfer, since it is likely that the risk will be transferred back to the government in the form of higher risks, risk premi-

ums, and project problems. The issue of balancing project risks is more exuberated in the context of complex projects where the potential for competition is much more limited than it is in other sectors.

Under the PPP approach, the project associated risks are transferred from the public to the private sector. The central issue to address is who best bears what risk. Efficient risk allocation dictates that risk must rest with the most able party to retain. If the principle is violated, the government may face higher risk premium than necessary or illusion of risk transfer. Additionally, the basic principles of transparency, cost effectiveness and quality soundness must be ensured in all decisions.

Understanding, therefore, the process of proper risk allocation will certainly help translate the project risks into effective PPP contracts, depending on the scope of defined tasks and responsibilities, and thus avoid the so-called "illusion of risk transfer" in the quest for more efficient service provision to the public.

Risk in critical infrastructure appears as *sui generis* risk. Such risk cannot be quantified and determined as enterprise risk, a generic category of risks which could potentially be treated contractually and transferred by the public sector to the private sector or retained by the party to an arrangement which is suited best to borne such risks.

Risk in critical infrastructure, being either internal or external, is endemic to such services and when critical infrastructure is delivered by public-private partnerships or owned by private actors, the treatment of such risk merits a third-party approach. Such third-party could be an industry in itself, such as insurance, re-insurance or hedge fund insurance bond finance, or a sector / industry approach which related to the owners/operators of the relevant infrastructure, by means of collective apportioning and mitigation of risks associated with the failure of providing services from such infrastructure. The most innovative way of treating risk of critical infrastructure remains in the discretion of EU Member States, in the form of integrating costs related to risk assessment and security measures to protect critical infrastructure into tariff arrangements of relevant services. In such manner, the end-user / consumer of services ensures and collectively insures their delivery against any type of risk which is not quantified and determined as part of corporate arrangements between the state and the private sector provider of services.

33 In 2013, the European Commission evaluated the progress made by EPCIP and suggested the programme enter a new more practical phase for the future. This phase involves launching a pilot project analysing four critical European infrastructures with regards to possible threats. These include the EU's electricity transmission grid; the EU's gas transmission network; EUROCONTROL – the EU's Air Traffic Management; GALILEO – the European programme for global satellite navigation.

34 See the position of The "Thematic Network on Critical Energy Infrastructure Protection" (TNCEIP), an initiative of the DG Energy of the European Commission consisting of European owners and operators of energy infrastructure in the electricity, the gas and the oil sectors, Brussels, November 2012.