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ALEKSANDRA HĘĆKA-SADOWSKA

aleksandra.hecka-sadowska@ue.poznan.pl
Poznań University of Economics and Business. Institute of Finance
Al. Niepodległości 10, 61-875 Poznań, Poland
ORCID ID: https://orcid.org/0000-0002-7649-9528

Agency Theory and Environmental Damage – an Environmental Insurance as an Instrument of Control

Keywords: agency theory; environmental damage; environmental insurance; Environmental Liability Directive; the EU-CEE countries

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Abstract

Theoretical background: Implementing the Environmental Liability Directive (ELD) based on the "polluter pays" principle has increased the legal liability of entities using the environment for the imminent threat of environmental damage and environmental damage caused by their activities. Conclusions of the ELD evaluation assessment and Special Report prepared by the European Court of Auditors revealed several problems confirming a need for continuous monitoring and control of the implemented environmental law, usually performed by the state. Complying with legal requirements in the field of environmental protection is a principal-agent relationship, where based on the implicit social contract, the state (the principal) gives licences to operate and partly delegates the duty to protect the environment to the operator (the agent) and the agent in case of imminent threat of environmental damage or environmental damage is required to, *inter alia*, take preventive and remedial action.

Purpose of the article: The paper mainly aims to examine, whether and to what extent standalone environmental insurance, also referred to as environmental impairment liability (EIL) insurance, may be used by authority (the principal) as an instrument of control of environmental damage in terms of the ELD caused by operators (the agent).

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Research methods: The research methodology involves deductive reasoning and is based on a qualitative analysis of the literature (mainly on agency theory and environmental insurance), the ELD, national reports for Member States from the CEE countries, including ELD cases, industry reports, and documents on the environmental insurance market in the EU-CEE countries, and a comparative analysis of the features of available insurance solutions for environmental damage.
Main findings: The paper's findings indicate that standalone environmental insurance, which supports the environmental risk management process and provides a cover for liabilities arising under the ELD, may be used to monitor the agency's activity. However, despite the broader scope of standalone environmental insurance coverage and better alignment with ELD requirements than that of traditional property and casualty insurance, it is not a widely available and commonly used tool in selected CEE countries. A great deal of effort is therefore needed to develop these EIL insurance markets for cooperation between the government and the insurance market in this area.

Introduction

The transition from a centrally planned economic system to a market-based economy which took place in CEE countries after 1989 revealed not only economic, social, and health problems in these countries, but also a devastation of the natural environment (Bowman & Hunter, 1992; Carter & Turnock, 2002; Pavlínek & Pickles, 2000; Vari & Tamas, 1993). However, the collapse of state socialism and the subsequent implementation of environmental policies and legislation did not solve the problem. Together with the democratization and marketization process, new types of environmental issues related to mass consumerism occurred (Karaczun & Kassenberg, 2019; Pavlínek & Pickles, 2004).

Despite the intensity of the transformation process varied between CEE countries, the great impact on environmental quality and protection had their accession to the European Union (Carmin & Vandeveer, 2004; Turnock, 2002). Becoming an EU member meant an adaption to and implementation of environmental laws, rules, and standards, including provisions to ensure reductions in national, transboundary, and global pollution. The above was supported by the influx of financial aid and investment programs into the CEE region after the collapse of the socialist regimes (Carmin & Vandeveer, 2004). However, in transition countries, where the legacy of dysfunctional state structures and state-society relations have emerged as some of the most serious problems, a strong state is crucial to implement comprehensive reforms and develop mature democratic systems (Jerre, 2001). It is due to the fact that law avoidance – a perennial communist and post-communist survival strategy – becomes rational and normative where law is irregularly and badly enforced (Sajó, 1997). The effectiveness of EU environmental policies following the principles of precaution, prevention, rectifying pollution at source, and "polluter pays" depends largely on their implementation at national, regional, and local levels. Since the inadequate application and enforcement of regulations remain an issue, monitoring both the state of the environment and the level of implementation of EU environmental law is of key importance (Kurrer & Petit, 2024).

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One of the relevant environmental legislation for the application of the "polluter pays" principle is the Directive 2004/35/CE of the European Parliament and of the Council of 21 April 2004 on environmental liability with regard to the prevention and remedying of environmental damage, also referred to as the Environmental Liability Directive (ELD), which entered into force in 2007. According to the ELD, environmental damage means damage to protected species and natural habitats, to water and soil, whereas an imminent threat of environmental damage means a sufficient likelihood of occurring of such damage shortly. It makes those whose activities threaten the environment liable for taking preventive action, and those that have caused environmental damage liable for remediation. It also obliges the operators to notify the relevant competent authority of the imminent threat of, or actual, environmental damage (Directive, 2004).

Conclusions of the ELD evaluation assessment revealed several problems such as lack of data on ELD incidents (inability to compare), low level of stakeholders' knowledge of the ELD, discrepancies in the interpretation of the main concepts, the limited scope of and the lack of financial security for claims in case of insolvency of the polluter, and limitations of ELD scope. Due to the above, the European Commission adopted a work programme for 2017–2020, which was continued in 2020 as the Multi-Annual Rolling Work Programme (MARWP) for the period 2021–2024 (ECA, 2021). The following priority areas for action were identified: (1) supporting the implementation of the ELD through the development and application of accessible, user-friendly tools and other administrative support measures, (2) promoting the availability of financial security for ELD liabilities across the EU, (3) providing better information system (EC, 2020). Also, the Special Report prepared by the European Court of Auditors indicated an inconsistency in the application of the "polluter pays" principle across EU environmental policies, including the ELD. According to the authors, the main weaknesses are unclear key concepts and definitions, and the absence of financial security in cases of insolvency (ECA, 2021, p. 5).

Those assessments confirm the above-mentioned need for continuous monitoring and control of the implemented environmental law, which is usually performed by the state. The role of the state in environmental protection in economic theories is variously defined. According to Pigou, who developed many of the key neoclassical concepts, especially in terms of welfare theory and externalities, the existence of externalities is sufficient justification for government intervention (Pigou, 1932). Representatives of New Institutional Economics reduced the role of the state mainly to the creation and enforcement of property rights to natural resources and introducing environmental regulations and standards to reduce transaction costs when they are high (Coase, 1960; Williamson, 1985). The role of the state as a regulator of pollution due to the introduction of, *inter alia*, emission limits and environmental standards was postulated by representatives of ecological economics like Daly (1991), according to whom, "the economy is an open subsystem of a finite and non-growing ecosystem (the environment)" (p. xiii).

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Whatever the role of the state, which varies according to the political system or the economic model adopted, there is a relationship between government and society, including businesses, which is crucial for the functioning of the economy. In the field of environmental protection, many of state duties are delegated to companies through environmental law. According to Pratt and Zeckhauser (1985), "[w]henever one individual (or party) depends on the action of another, an agency relationship arises. The individual taking the action is called the agent. The affected party is the principal" (p. 2). As indicated by Ross (1973), "an agency relationship has arisen between two (or more) parties when one, designated as the agent, acts for, on behalf of, or as representative for the other, designated the principal, in a particular domain of decision problems" (p. 134). Thus, complying with legal requirements in the field of environmental protection is a principal-agent relationship.

Based on studies redefining the agency theory (Arrow, 1984; Power, 1991; Shaukat et al., 2023; Sjåfjell, 2018) and suggestion of some authors to go beyond the shareholder company scheme and take into account the interests of all the company's stakeholders (Boatright, 2002; Zingales, 2000), the paper mainly aims to examine, whether and to what extent standalone environmental insurance, also referred to as an environmental impairment liability (EIL) insurance, may be used by authority (the principal) as an instrument of control of environmental damage in terms of the ELD caused by operators (the agent). To achieve the above objective, the author: (1) investigates the selected ELD cases that occurred in the EU-CEE countries and characterises key features of environmental incidents, (2) studies the scope of insurance market products' cover for liabilities under the ELD and environmental risk assessment, and (3) overviews the EIL insurance market in the EU-CEE countries, including demand for and availability of such product and compares it with markets in other EU Member States.

Literature review

The majority of researchers in the business area of studies, when exploring agency theory, mainly focused on the relationship between the company and stakeholders providing financial capital (e.g. Fama, 1980; Fama & Jensen, 1983; Jensen & Meckling, 1976). However, other examples of the principal-agent relationship were provided by Arrow (1984), who claims that "in pollution control, society may be regarded as the principal, and the polluter, whose actions cannot be fully monitored, as the agent" (p. 4).

The application of agency theory to the problem of environmental pollution suggested by Arrow (1984) was used by Power (1991), who examined the general model of accountability that consists of two parties characterised as "principal" and "agent" and its relevance for environmental auditing. The author claims that "the general principal-agent model is fluid and contestable in the context of environmental audit"

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(Power, 1991, p. 36). Power suggested an environmental agency model, in which society or even the state or nature is used as the principal. However, as he pointed out, this model is not free of difficulties such as the identification of the objects and their interests in particular. A potential and relatively safe source to define the principal's role, in Power's view, is the legal environment of contract law. The next issue is the type of relationship between both parties, which Power named "social technology" and, referring to political theory, is characterised by social contract. The author, regarding to Hobbes and Rousseau, defined it as "a theoretical construct in which individuals »choose« to enter and subject themselves to social and political arrangements involving the delegation of authority" (Power, 1991, p. 34). According to Power, a value framework about the rights and responsibilities of individuals is crucial to the appeal of contracting technology as a basis for establishing social accountability. Another problem identified by Power is the nature and recognition of the action taken by the agent (company) and its impact on the environment due to the complex nature of environmental risk. This, in Power's view, can exacerbate the hidden-action problem, where the principal tries to monitor some agent's actions that are less important than others and invisible to both parties.

An attempt to redefine agency theory in corporate law to internalize environmental product externalities based on life-cycle thinking was made by Sjåfjell (2018). The author argues that "shareholder primacy is a major barrier to corporate sustainability" (p. 111), pointing out that identification of agency problems is used as a normative basis to define certain societal interests as external and, it is postulated that such should be regulated by other than corporate law, despite its limitation observed, for example, in environmental law. Sjåfjell referenced in her work Armour et al. (2017) who identified three generic agency problems that arise in firms. Each problem involved the conflict between: (1) the firm's owners and its hired managers, (2) the majority or controlling owners and minority or non-controlling owners, and (3) the firm itself (its owners) and other (contractual) parties such as creditors, employees and customers. In a redefined agency theory for modern corporate law proposed by Sjåfjell (2018), where the agents are the corporate decision-makers, a new identification of three core agency issues was indicated. In each the principal is set out: (1) the corporation itself, including employees, (2) the shareholders, and (3) people and the environment directly affected by corporate activity. At the same time, the author acknowledges that the question of how to ensure that corporate decision-makers act appropriately as agents for people and the environment as principals is probably the most important issue in modern corporate law. Although, like Power, Sjåfjell recognises the problem of identifying such principles, she believes it should be a central part of the responsibility of corporate decision-makers. According to the author, in the case of conflicts among these three core agency issues, priority should be given to the company, people, and the environment over shareholders. Balancing the interests of the principals in the first and third issues is fundamental to reaching corporate sustainability. Instead of the traditional economic approach to internalisation, Sjåfjell

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suggested that integrating product life-cycle thinking into the role and responsibilities of the board of directors can unlock the potential of any company to produce in an environmentally sustainable way (Sjåfjell, 2018, pp. 123–124).

Shaukat et al. (2023) proposed a Natural Environment Agency Theory (NEAT), based on the positive agency approach, which considers the relationship between the firm (the agent) and society (the principal) in the context of the natural environment. According to the authors, who rely on public property rights to clean air, water, and land, the society considered as environmental regulators, consumers, environmental activities, etc., and the firm are bound by an implicit and incomplete "natural environmental contract". Based on this contract, the society grants the firm permission to operate and the firm is under the duty not to pollute public environmental resources (common goods) during the production and sale process. However, as negative externalities such as pollution, depletion, and degradation of the natural environment and biodiversity are imposed on society, referred to by Shaukat et al. (2023) as environmental agency costs (NEACs), the society has the right to demand that the company take remedial action and internalise these costs. Otherwise, the society can revoke the "licence to operate", that the authors refer to. According to Shaukat et al. (2023), mitigation of NEACs may be possible through three mechanisms: (1) bonding by environmental commitments, (2) monitoring through control by various social actors, (3) incentives. The authors developed and tested the NEAT predictions, which were confirmed by their results, using US-listed companies from the period 2005–2019 and data from several databases.

Research method

The research methodology involved deductive reasoning and was based on a qualitative analysis of the literature, primary and secondary sources, and a comparative analysis of the features of available insurance solutions for environmental damage. The analysis of source materials mainly included literature on agency theory and environmental insurance, the ELD, national reports for Member States from the CEE countries, including ELD cases, industry reports, and documents on the environmental insurance market in the EU-CEE countries. The study consisted of identifying agency theory and its environmental derivatives and using them to conclude the research problem.

Results and discussion

Based on the agency theory revised by Arrow (1984), Power (1991), Sjåfjell (2018), and Shaukat et al. (2023), the author proposes an environmental damage agency theory, in which, instead of society, the state (public authorities) will be

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recognised as the principal, whose aim is to protect the environment and to achieve sustainable development. The operator is an agent, whose main objectives are often different from those of the state, and improving its environmental performance by, for example, low-emission technologies involves considerable expense. Similar to the revised NEAT theory, the operator activities are required to provide society with goods and services, but it is the state who gives or revokes licences to operate for example through environmental permits. Substitution of the society for the state seems to solve the problem of identification of the principal mentioned by Power (1991) and Sjåfjell (2018), if only due to the state representatives. The suggested change of the principal derives from the legitimacy of the authority of the state over the individual, including the protection of the environment and regulation of it, which society gives to the state based on the social contract. This implicit contract means that citizens surrender some individual freedoms and rights to authority in exchange for protecting their other rights or maintaining social order. It also refers to common goods such as the environment and its social, cultural, and economic aspects. The above is often regulated by the constitution or other law, where care for the environment and/or nature is the duty of the state (public authorities). For example, as stated in Article 54 of the Lithuanian Constitution, "[t]he State shall take care of the protection of the natural environment" (The Constitutional Court of the Republic of Lithuania, n.d.), Article 74, Section 2 of the Polish Constitution, "[p]rotection of the environment shall be the duty of public authorities" (Sejm Library, n.d.), and Article 135 Section 2 Point e of the Romanian Constitution, "[t]he State must secure environmental protection and recovery, as well as preservation of the ecological balance" (President of Romania, n.d.). Similar follows from the ELD, where competent authorities should be the guardians of the environment. However, according to the Polish Supreme Audit Office report on the responsibility for preventing and remedying environmental damage, the General Director for Environmental Protection (GDEP) and the Regional Directors for Environmental Protection (RDEPs), when carrying out tasks concerning the prevention and remediation of environmental damage in most cases acted incorrectly and ineffectively (NIK, 2022, p. 9). Among the deficiencies in the operation of the GDEP are indicated: lack of day-to-day and systematic supervision of the RDEPs, the failure to take action to reduce or remove systemic barriers, and failure to meet the time limit for consideration of appeals. According to the authors, the RDEPs, among other things, were dilatory and ineffective in their handling of notifications of imminent threats of environmental damage, and incorrectly maintained registers of above (NIK, 2022, p. 9). The author agrees with Shaukat et al. (2023) that in an era of growing environmental awareness and NGO activism monitoring of the environment is no longer solely a matter for the government, but it seems to have the most effective and widest range of tools, which, however, must be improved, to deal with it.

Based on the implicit social contract, the state partially delegates its duty to entities, whose activity may cause the threat of environmental damage and/or envi-

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ronmental damage in the form of legislation like the ELD, under which the polluter is responsible for taking preventive and remedial action. The key problems in the state-company relationship are the same as in traditional agency theory, where Arrow (1984) identified two kinds of principal-agent problems: hidden-action and hidden-information, which in the literature referred to as moral hazard and adverse selection, respectively and have been taken from the insurance (p. 3). The first problem is related to the agent's effort, who may want to avoid performing the action agreed in the contract. The second problem of agency refers to hidden-knowledge and situations when the principal cannot verify whether information gained by the agent during observations is used to decide the best for his interest way. Operators have more information about the environmental impact of their activities than the state. This can lead them to hide their true activities and make decisions that are detrimental to the principal such as polluting. It can also lead to under-reporting of emissions data or so-called greenwashing, i.e. giving the impression that the company's activities have a positive impact on the environment. Furthermore, if companies believe that they will not suffer the consequences of their negative environmental impacts, or that these will be passed on to taxpayers, they may not take action to protect the environment or prevent environmental damage.

In agency theory, to reduce the discrepancy between the desires or goals of the principal and agent, monitoring the agent's actions to avoid undesirable or out-of-interest decisions may be established (Jensen & Meckling, 1976). The principal needs to monitor the agent's actions to ensure that the agent is pursuing its objectives and not just its interests. The author suggests using environmental impairment liability insurance as an instrument of control agents' activity. The EIL insurance is one of the key mechanisms for mitigating risk and providing funds for environmental remediation, thereby reducing the burden on the state budget and taxpayers.

The introduction of detailed risk assessments, audits that provide information on actual risks, and the obligation to inspect and report, which improves the transparency of the company, can contribute to reducing information asymmetries. In addition, linking the premium to the degree of risk posed by the activity and even refusing to take out insurance or pay claims in the absence of prevention can help to minimise moral hazard. However, this requires close cooperation between the government and the insurance industry, which has a unique role to play in the rapidly changing risk landscape. It not only can address global challenges such as climate change by making society and the economy more climate resilient (Hielkema, 2023) or help in achieving the Sustainable Development Goals (SDGs) (Bacani, 2015; Holliday et al., 2021; Wanczeck et al., 2017), but also improves environmental risk management (OECD, 2003; UNEP FI, 2022). That refers mainly, but is not limited to, both compensation and prevention functions of insurance.

Environmental incident data, which Member States are obliged to collect under the ELD, are another source of information on environmental damage. However, due to no requirement to collect information about ELD cases between 1 May 2013

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and 25 June 2019 by the Member States, it is not feasible to provide an accurate estimation of the number and types of ELD occurrences (both an imminent threat of damage and environmental damage) in the European Union. A further reason that impedes the accuracy of the count is not reporting the incidents as ELD occurrences in some Member States due to handling them under national liability legislation (Fogleman, 2021, pp. 114–115).

A detailed examination of the data from each CEE country in two periods (between 30 April 2007 and 30 April 2013, and between 1 May 2013 and 1 November 2021) reveals the following conclusions (Fogleman, 2021, pp. 116–117).

– In the vast majority of surveyed CEE countries (approx. 73%), the total number of reported cases is small and does not exceed 15 incidents (Bulgaria – 8, Croatia – 0, the Czech Republic – 0, Estonia – 15, Lithuania – 6, Romania – 6, Slovakia – 2 and Slovenia – 2). In comparison to other EU Member States, there is less number of ELD occurrences than that observed in countries such as Portugal (23), Spain (42), Germany (60, but only in the first period), Greece (146), and Italy (218).

– Two countries, where the total number of reported cases exceeds 500 incidents are: Poland – 695 and Hungary – 573 (however, for Hungary the data in the second period is not available). This is the highest number of ELD cases in all Member States, and those two CEE countries were responsible for almost 90% (1,066 out of 1,245) of all reported occurrences in the first period of survey.

The European Commission in a Report from the Commission to the Council and the European Parliament under Article 18(2) of Directive 2004/35/EC on environmental liability with regard to the prevention and remedying of environmental damage, explains this phenomenon by several factors, including the existence of disparate legal frameworks and traditions, variations in environmental conditions, and differing interpretations of pivotal terminology and concepts (EC, 2016).

When investigating individual national reports on ELD cases in selected CEE countries, some examples of cases were chosen to provide with description of the variety of imminent threat of damage and environmental damage (Table 1).

Table 1. Selected ELD cases in CEE countries

Country	Type of event	Description of event	Preventive/remedial measures	Costs
Estonia	• land damage • threatened damage to groundwater (near the Pirta River)	Due to the bad weather conditions on the road, a fuel truck with trailer and around 6,000–8,000 litres of diesel fuel collected up from the polluted surface, drove into the ditch.	• excavation and treatment of polluted soil • collection of soil and water samples • pumping out and treatment of polluted water • infilling with soil	EUR 20,895.87 (including VAT) + fuel spilled
Lithuania	land damage	Damage was caused by the manufacture of refined petroleum products. No more data is available.	• removal of contaminated soil • surface and underground biological treatment of soil	Preliminary costs of remediation: EUR 845,700

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Country	Type of event	Description of event	Preventive/remedial measures	Costs
Romania	water damage	Due to the broken pipe petroleum products polluted the surface water of the Oltet River with vegetation on both banks of the river.	• restoration of the entire area to its original state • primary remediation	EUR 469,786, without VAT

Source: Author's own study based on (EC, n.d.).

Based on national reports, key features of environmental incidents have been identified.

– Because there is no limit of liability and costs for the preventive and remedial actions, which shall be borne by the operator in case of an imminent threat of environmental damage and environmental damage under the ELD, they can be very significant and have a markedly detrimental impact on its financial standing. Approx. EUR 42,000 per occurrence was spent to remedy the damage in all EU Member States between 2007 and 2013, however, in individual cases damages ranging from a few thousand to over EUR 50 million for large-scale losses (EC, 2016).

– In most ELD occurrences, where the data was available, the operator liable for an imminent threat of environmental damage and environmental damage was carrying out a dangerous activity listed in Annex III of the Directive (e.g. IPPC/IED permit, waste licence/permit, discharges polluting substances to water, manufacture, use, storage, processing, filling, release into the environment and onsite transport of dangerous substances and GMOs). This means that a strict liability scheme applies and there is no need to prove its fault. In other cases, operators whose activity is not mentioned in the ELD, fall under fault-based liability and this applies only to damages to protected species and natural habitats.

– The preventive and remedial action procedure is complex and time-consuming. In some cases, several years were needed to close it.

Due to above, the operator, whose activity can lead to occurrence of such damage, should consider not only strengthening its controls and response plans, but also reducing financial consequences of such event through the implementation of financial security instruments such as EIL insurance.

The implementation of the ELD increased the legal liability of entities using the environment, requiring them to take preventive and remedial action. One of the principal financial securities that may be used to satisfy the ELD is insurance. Due to the differences in scope of coverage between various insurance products, an overview of the typical available coverage is provided (Table 2). However, it may differ from this for an individual policy.

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Table 2. Scope of insurance market products' cover for liabilities under the ELD

Type of liability	ELD requirements	Environmental extension to general liability insurance	Property damage insurance	Stand-alone environmental insurance
Statutory requirement for remediation (caused by sudden and accidental, and gradual incident)	Yes	Not included	Not included	Included
Statutory requirement for prevention	Yes	Not included	Not included	Included
Third-party (tort) liability for bodily injury and property damage (caused by sudden and accidental, and gradual incident)	No	Included only for sudden and accidental pollution of water or land (biodiversity damage is excluded)	Not included	Included
First-party liability for clean-up costs on own site	Yes	Not included	Included only for pollution caused by insured peril (sudden and accidental incident) to insured property (land or water is excluded)	Included
First-party liability for business interruption	No	Not included	Included only due to no access to property damaged by pollution caused by insured peril (sudden and accidental incident)	May be included (optional)
Statutory liability for historic contamination	Yes (up to 30 years)	Not included	Not included	May be included (optional)

Source: Author's own study based on (Kivisaari et al., 2022).

Standalone EIL insurance provides cover for both first-party and third-party remediation costs, including statutory recoverable costs borne by the competent authority that carries out preventive and remediation measures. According to the ELD, such costs include: the costs of environmental assessments carried out to determine the extent of the damage and the measures necessary to remedy it, any remediation efforts undertaken directly by the authority, administrative, legal, and enforcement costs, and data collection, monitoring, supervision and other related costs (Directive, 2004). This type of insurance covers both prevention and recovery costs such as emergency costs, crisis management response, site investigation, and legal expenses. A distinctive feature of standalone environmental insurance is that it is underwritten on a claims-made rather than an occurrence basis. The temporal distance between the cause and effect of pollution is irrelevant in this type of insurance. It is important especially in case of gradual pollution like, for example, leaking from underground storage tanks (Broderick et al., 2000; Fogleman, 2024, pp. 75–77; Hęćka-Sadowska, 2023, pp. 212–218).

Contrary to standalone policy, in environmental extension to general liability policy some insurers require the pollution incident must begin and end within a 72-

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hour timeframe. Furthermore, this insurance solution (for example, on the Polish insurance market) usually provides cover only for third-party claims for bodily injury and property damage in case of remediating off-site from a sudden and accidental incident on the insured's site, and it has rather low sub-limits of liability. Property damage policy (only first-party), aiming to repair or replace property, not the environment, also does not provide sufficient cover for liabilities under the ELD, because claims by third parties against the insured are not covered. In some Member States, environmental extensions to property policies, which provide cover for remediation on-site of pollution from a sudden and accidental incident on the insured's site, are available (Fogleman, 2024, p. 72).

Due to the complexity of environmental risks and lack of experience in this area, a few insurance companies decided to provide this type of insurance. Underwriting challenges include: a lack of reliable and complete data, lack of risk assessment specialists, low competition, demand mainly from large companies with hazardous activities, which means high exposure to environmental risks, and difficulty in damage assessment (Hęćka-Sadowska, 2023, p. 209). Misheva (2015) indicated loss frequency and loss ratio as two main issues, which made the underwriting process in EIL insurance more difficult than in other types of liability insurance. To obtain specific information on the environmental risk, insurers require to complete the risk assessment questionnaires, which in the case of EIL insurance, are enriched by several additional, often very detailed questions. Those questions refer to: (1) location (e.g. type of current and past activity, land use, technological processes carried out, surrounding, method of storage, information on hazardous substances used, stored or manufactured, waste management, subsoil, and hydrology, including level of groundwater), (2) transport, if carried out (e.g. number of means of transport used, territorial scope, type of transported goods), (3) security/management systems (e.g. certified environmental management systems ISO 14001 or EMAS, emergency plans/procedures in case of threat of or environmental damage, (4) damages or environmental events during last 3–5 years (Colonnade, 2019).

The precursor of EIL insurance was the United States, where, as late as the early 1960s, insurance coverage for pollution effects was still provided as part of standard property and casualty insurance terms. However, as the number of damages and claims in this area increased, insurance companies began to introduce exclusions, firstly from gradual and then also sudden and accidental pollution, from insurance coverage. The first standalone EIL insurance was offered at the end of the 1970s and provided cover for gradual pollution liabilities. In the mid-1980s, the market for these insurances stagnated again, and it was not until the late 1990s that it began to grow rapidly (Lemkowska, 2024). The European EIL insurance market commenced during the mid to late 1990s when a growing number of Member States introduced legislation mandating liability for the remediation of contamination. The accession to the EU by an additional ten countries in 2004, two in 2007, and the ELD implementation in 2004 and its transposition to national law by 2007 expanded the

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environmental insurance market in the EU, leading to more insurers entering the market (Fogleman, 2024, p. 73).

The scope of cover for the ELD in standalone environmental insurance in particular in CEE countries is rather similar and includes both prevention and remediation costs. However, in some countries the cover is limited only to pollution, thus, environmental damage is not covered (e.g. Bulgaria) or it requires suddenness and accidentality (e.g. in the Czech Republic, Hungary, Latvia), and in other countries complementary and compensatory costs are excluded (e.g. in Latvia) (Fogleman, 2020, pp. 200–202).

The EIL insurance market varies from Member States in the CEE region and three groups of its development level may be identified (Fogleman, 2020, pp. 200–202, 205–206).

1. Most developed markets are in the Czech Republic and Slovakia, where the availability of such insurance rose with the introduction of mandatory financial security in 2013 and 2012, respectively, and is high. However, the demand for environmental insurance is still low, but growing (in the Czech Republic) and moderate, but growing slowly (in Slovakia).

2. Medium-sized or small markets in early stages of development are in Bulgaria, Hungary, and Poland, where the availability is limited in first two mentioned and low, but increasing in Poland. The demand for such financial instrument in those countries is also low or moderate, but growing like in Poland.

3. In the remaining countries such as Croatia, Estonia, Latvia, Lithuania, Romania, and Slovenia EIL insurance is not available or not generally available. The demand for it is extremely low or even does not exist.

The EIL insurance market in the CEE region is less developed than in other EU Member States. In countries such as Austria, Belgium, Denmark, France, Germany, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, and Sweden environmental insurance is available or even highly available. However, there is no EU Member State, where the level of demand for EIL is significant. In the mentioned countries, it is rather moderate to good or even low in such Member States as: Austria, Denmark, Germany, Italy, Luxembourg, and the Netherlands (Fogleman, 2020, pp. 200–203, 205–206).

The low stage of development of EIL insurance markets in the EU-CEE countries generates limitations of EIL insurance offers in favour of environmental extensions to general liability policies, which present a lower risk due to more limited cover and sub-limits of liability. In addition, there is still a general market problem with high complexity and non-standardisation of environmental insurance, which makes it problematic to tailor this type of insurance to the needs of potential buyers. From the demand side, one of the main reasons for poor market penetration is the difficulty in understanding the differences between coverage provided by traditional property and casualty insurance, and EIL insurance. Furthermore, insufficient technical proficiency in environmental aspects of the business risk of insurance intermediaries,

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who should support insureds in the risk management process may also be problematic (Dybdahl, 2016; Lockton, 2024).

According to UNEP FI (2022), continued investment in and support for environmental risk assessments, risk surveys, and risk mitigation strategies is one of the most fundamental actions the insurance industry can take to improve environmental risk management. Malinowska (2024) pointed out the preventive function of EIL insurance and indicated the insurer's prevention activities which should be aimed at the elimination or reduction of risks. The author highlighted the role of new technologies such as the Internet of Things (IoT) or satellites to identify and assess environmental risk (e.g. "detecting pollution and improving remote and continuous soil, air and groundwater monitoring", Malinowska, 2024, p. 288).

To strengthen this instrument of control, the introduction of compulsory environmental insurance should be considered. The issue of the justification for introducing compulsory environmental insurance has already been considered in the relevant literature (Fogleman, 2020; Hęćka-Sadowska, 2023, pp. 225–231; Insurance Europe, 2017; Lemkowska, 2018; Maśniak, 2009, 2012; OECD, 2003). However, such demand for discussion is exacerbated by the fact that in some countries, such as Poland, regulators have excluded damage caused by pollution or environmental contamination from the scope of compulsory motor insurance and delegated the action to the agent. Although the ELD does not direct Member States to require mandatory financial security for liabilities that may arise under the ELD, some of the EU-CEE countries such as the Czech Republic and Slovakia have introduced such a system. Poland also has legislation requiring such financial security for a limited number of activities (Fogleman, 2024, p. 83). In the Czech Republic and Slovakia, to determine whether operators are subject to the mandatory financial security system, the regulator provided them with a special methodology for self-assessment. In addition, in the Czech Republic if the total amount of control points exceeds 50, which means that the cost of remediating environmental damage is estimated to be less than CZK 20,000,000 (EUR 819,672), operators are required to confirm financial security to the competent authority unless they have implemented EMAS or ISO 14001 or have started the registration process (Fogleman, 2024, pp. 86–87). The above procedure of self-assessment may be used as a part of a control mechanism based on the environmental damage agency theory proposed by the author.

Conclusions

Pollution is a major concern of EU citizens and represents a significant cost to society. This problem is particularly relevant in post-transition countries, where the poorly structured incentive system due to the lack of property rights and inadequate information in the decision-making process was one of the main reasons for environmental degradation under socialism (Hill, 1992). However, significant developments

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in environmental protection have been made, these countries have not yet effectively tackled all their environmental problems (Karaczun & Kassenberg, 2019). Thus, protecting the environment, including monitoring of environmental impact of business activities and associated risks, is still required and is the responsibility of the state, which partially delegates it to the operators.

The divergence of interests between the principal (the state) and the agent (the operator) and the existence of information asymmetry refers to the possible imminent threat of damage or environmental damage caused by the agent, which are main conditions of agency theory, was used to develop an environmental damage agency theory. Based on it, the author proposes environmental insurance as an instrument of control that may be used to reduce the above and to comply with environmental legal requirements. The paper's findings indicate that this type of insurance, which supports the environmental risk management process and provides a cover for liabilities arising under the ELD, may be used to monitor the agency's activity. However, despite the broader scope of standalone environmental insurance coverage and better alignment with ELD requirements than that of traditional property and casualty insurance, it is not a widely available and commonly used tool in selected CEE countries. Thus, a great deal of effort is therefore needed to develop these EIL insurance markets for cooperation between the government and the insurance market in this area. The state may play an important role in the expansion of insurance methods in environmental risk management, as it can use incentives (e.g. in the form of subsidies for insurance premiums or co-financing of investments in improving environmental performance if required by insurers) to increase demand for this type of financial instrument.

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