

Research Article

Analysis of the Legal Framework on Hazardous Substances: A multilevel correlation between International, European and National Perspective**Michail Chalaris^{1,*}, Nikolaos Stasinopoulos¹ and Anastasia Tezari^{1,2}**¹Department of Chemistry, School of Science, International Hellenic University, Agios Loukas 65404, Kavala, Greece²Faculty of Medicine, School of Health Sciences, National and Kapodistrian University of Athens, Goudi 11527, Athens, Greece

Received 20 September 2021; Accepted 30 December 2021

Abstract

This paper explores the legal framework for hazardous substances applied in Greece, in combination with European and international legislation through the years, by addressing the core regulations enacted. These refer to the classification of hazardous substances, their transportation, the accidents' prevention and the environmental impact of such accidents. The REACH and CLP framework is presented, alongside with the adoption of its requirements by each Member State. The SEVESO III directive is analyzed, indicating the necessity of its application to more complicated cases. The significance of transportation of hazardous substances is highlighted, based on the ADR/RID/AND regulations, governing international carriage of such substances. The incorporation of Directive 2004/35/EC (ELD) regarding the environmental impact of accidents caused by hazardous substances is addressed. This analysis explicitly defines the terms this directive and its progress can establish a way of jurisdiction regarding environmental law, indicates the significance of the enforcement of the provisions regarding hazardous substances and ensures that all existing regulations conduct a more safe and environmentally friendly operation. It is essential to identify the difficulties of the establishment of a generic framework for different countries within European countries and how this frame should be updated to comprehend new members' features.

Keywords: hazardous substances, environmental legislation, REACH, CLP, ADR, RID**1. Introduction**

The aspects of the legal framework for hazardous substances applied nationally in Greece, are thoroughly presented in this work, in combination with the corresponding laws in Europe and internationally, by taking in account the progress made through the years. This paper will be divided in four parts, according to the four core regulations enacted and refer to classification of hazardous substances and their impact on humans, accidents' prevention due to hazardous substances, their transportation, and the environmental impact of accidents also due to hazardous substances.

In the first part, we will mainly refer to the "Regulation on Registration, Evaluation, Authorization and Restriction of Chemicals" (REACH) and the "Classification, Labeling and Packaging of substances and mixtures" (CLP) framework, its specifications, where it can be applied and how European countries have adopted the requirements in their national legislation. REACH was applied for EU members on 1st June 2007. The second part of the paper deals with the SEVESO directive, originated from the SEVESO disaster in Italy occurred in 1976. After this major accident, European Commission issued the SEVESO Directive in 1982 imposing harsher industrial safety regulations. Currently, the Directive has been amended to SEVESO III, indicating the necessity of applying to even more complicated cases. Greece has also incorporated SEVESO prerequisites into its national

legislation.

In the next part, the significance of transportation of hazardous substances will also be analyzed, where the regulations ADR (for road transport), RID (for rail transport) and ADN (for inland waterways) have been issued and governed international carriage of such substances. In Greece the ADR/RID 2013 version is applied since 07 October 2013, by the KYA 40955/4862/2013 transposing the ADR/RID Directive "Adaptation of the Greek Legislation to the provisions of Directive 2012/45 / EU on the inland transportation of hazardous goods"[1].

Finally, in the fourth part, the incorporation of Directive 2004/35/EC (ELD) will be addressed regarding the environmental impact of accidents caused by hazardous substances. An analysis will explicitly define the terms that this directive and its progress up to now can establish a way of jurisdiction regarding environmental law and the corresponding national legal framework will be presented.

Concluding, we will try to indicate the significance of the enforcement of the provisions of the legal framework regarding hazardous substances and how this affects all kind of procedures and ensures that all existing regulations conduct to a safer and more environmentally friendly operation. As a further matter, it is essential to identify the difficulties of establishment a generic frame to different countries within European Community and how this frame should be updated in order to comprehend new members' features.

*E-mail address: mchalaris@chem.ihu.gr

ISSN: 1791-2377 © 2021 School of Science, IHU. All rights reserved.

doi:10.25103/jestr.146.20

2. REACH and CLP Regulation - Laws enacted in Greece

Chemicals constitute a significant danger for the environment as well as the human health, throughout their entire life cycle, including the processes of production, handling, management, transport and use. To deal with this danger and given the fact that chemical industry has a broad and extensive trade and effect, it was a necessity to develop rules and regulation to ensure safe use, transport, and disposal. Countries throughout the world must have the knowledge of the chemical substances either they import, or they produce and develop the infrastructure required to control and minimize the risk and the exposure the chemicals can introduce not only to humans but also to the environment. Thus, an international standardization process to classify and label the chemical substances would be a solid foundation for the development of such rules and regulations.

For this reason, it is essential to classify the hazardous substances regarding their main characteristics that refer to labeling, packaging and waste. Manufacturers and suppliers must follow specific precautions on how they should handle these substances throughout the supply chain. Initially, under the regulation EC793/93 the chemicals were distinguished into "existing" and "new", and therefore did not produce enough guidance on the effects of the existing chemicals on both humans and the environment and thus was not capable of identifying the possible hazards and risk assessment imposed by the chemical industry. The date of 1981 was the limit for the distinction between existing and new chemical substances, therefore all chemicals listed as before of 18 September 1981 (and after 1 January 1971, in the European Community market) were reported as existing chemical substances that are included in the "European Inventory of Existing Commercial Chemical Substances" (EINECS). In 1981, more than 100.000 different chemical substances were added in this list [2]. Reach regulation has been issued in 2007, improving the former European Union legislation on chemical substances [3].

In this scope, REACH (1907/2006/EK) was a way of enhancing the competitiveness and innovation of the internal European chemical industry together with preventing people, and the environment from the hazards that chemicals can impose. It also introduced new ways for the risk evaluation of chemicals used without the need to be tested on animals, thus reducing this requirement. Through REACH regulation, the chemical industry can ensure more responsibility about the assessment and management of the imposed risks by providing appropriate and sufficient safety information to clients and users. REACH also requires anyone that uses a chemical substance (companies or individuals), within its working activities (professional or industrial), to verify and transfer all kind of information either to the European Chemicals Agency (ECHA) or directly to the manufacturers and the suppliers of chemicals or, regardless of the substances being on their own or constituting a mixture. REACH can be applied to many sectors, even to companies who are not directly associated or thought to be dealing with chemicals. The roles one might have within REACH are generally the following: **Manufacturer** (makes chemicals for use or supply), **Importer** (buys anything not only chemicals, such as clothes, plastics, furniture from outside the EU/EEA) and **Downstream users** (use of chemicals within their industrial or professional activities). Restrictions by the provisions of REACH regulation do not apply to companies with a non-EU origin, even in the case of their products' distribution in the

European Union [4]. Regarding products produced or transported to European Union or by Member States, REACH compliance is mandatory. However, Reach tends to be applied internationally by the manufacturers due to many other jurisdictions that have similar or pending legislation, in the case that their products may eventually enter the European market.

The REACH regulation has a direct connection to the CLP Regulation [5], which establishes hazard guidelines that can provide information in the sector of workplace protection and was fully applied in January 2009. The CLP Regulation (CE) 1272/2008 incorporates the "Globally Harmonized System of Classification and Labeling of Chemicals" (GHS), a United Nations standardization regulation which identifies hazardous chemicals and informs users about the risks, to previous European legal framework [6]. The "CLP" Regulation substituted the "Classification and Labeling of Hazardous Substances" (DSD, 67/548/EEC) and "Hazardous Preparations" (DPD-1999/45/EC) Directives. These directives were both revoked on 1 June 2015. "GHS" is the foundation for both national and international transport regulations for hazardous goods, and many countries adopt full compliance.

More specifically, the aim of this new regulation on Classification, Labeling and Packaging aims is the protection of both the environment and the human health as well as the proper function of the single internal market. It sets the "Classification Criteria" and discriminates the risk by the Labeling, the Packaging (safe disposal) and the Safety Data Sheets (SDS) for those who place hazardous substances on the market or mixtures. In this way, exposure can be avoided or reduced and therefore the risk. The probable hazards induced by chemicals are now illustrated in red signal words and/or pictograms instead of the previous common orange danger symbols on labels and safety data sheets [7]. The CLP regulation excludes substances and mixtures as radioactive, substances intended for scientific purposes (research and development) and are not placed commercially in the market, non-isolated intermediates products, waste, pharmaceuticals, veterinary medicinal products, cosmetics, medical devices (in direct physical contact with the human body or invasive), food (such as additives in food and feed and flavorings [8].

In Greece, CLP regulation came into force since 20/01/2009 and it is valid for substances from 01/12/2012 and valid for mixtures from 01/06/2015. CLP regulation could also be applied optionally before 2012 for substances and before 2015 for mixtures. Extension of enforcement can also be applied for substances placed on the market before 01/12/2012 and for mixtures placed on the market before 01/12/2015 [9].

According to Article 44 of Reach Regulation [10], Member States should advice all stakeholders and interested parties (manufacturers, distributors, importers and downstream users) regarding their obligations and responsibilities through establishment of national helpdesks under the supervision of national competent Authorities. In Greece, the Directorate of Energy, Industrial and Chemical Products of the General Chemical State Laboratory serves as the "Competent Authority" (CA) for the REACH and CLP regulations as well as the "Hazardous Preparations Directive" (DPD) [11], therefore generally for the execution and imposition of the National and European legal framework regarding hazardous substances and mixtures. Additionally, it is the CA for the Regulation on "Prior Informed Consent - Rotterdam Convention concerning export and import of hazardous chemicals" (PIC) and the compliance Authority of

the national Good Laboratory Practice (GLP) program. Furthermore, within its responsibilities, lies the pursuit of the Directive on Hazardous Waste, the SEVESO Directive on Chemical Accidents, the Stockholm Convention (Persistent Organic Pollutants – POPs) and the Chemical Weapons Convention, regarding issues that relate to hazardous substances transportation and the coordination of the national REACH and CLP Inspectors network.

3. SEVESO Regulation – Laws enacted in Greece

Major casualties involving hazardous chemical substances can be a considerable menace to people and the environment inducing additional economical losses and disruption of sustainable growth. Nowadays, chemical industry has a vast impact on every day's way of living since our modernized society can't avoid using large amount of hazardous chemicals in products and activities. In order to minimize the associated risks, necessary actions and measures need to be adopted not only to prevent catastrophic accidents but to obtain awareness and instant reaction when an accident like this happens.

In Europe, a serious accident taking place in 1976 in the town of SEVESO (Italy) highlighted the need for defining a legal framework for preventing such type of accidents and providing appropriate response actions. The Directive 82/501/EEC was issued incorporating principles that emphasize on the close relation between information and prevention. This new Directive established responsibilities of the chemical industry and issued a number of necessary steps and activities that needed to be adopted by them in order to prevent vital chemical accidents and restrict their effects on environment and the human health [12]. The deadline date for the implementation of the first Directive 82/501/EEC was the 8th January 1984 [13].

The European Community was determined to modify the existing legislation and therefore the knowledge derived from other major chemical accidents was incorporated giving birth to the SEVESO-II (Directive 96/82/EC) [14]. With this change, prevention of serious accidents would be accomplished and the safety level that would be achieved by minimizing the risk exposure with the adoption of severe controls will enhance protection across the Community [15]. The SEVESO II Directive replaced then the first SEVESO Directive [16] in order to serve two purposes; to prevent humans and the environment from accidents caused by hazardous substances; and taking into account the frequency and the similarity of such accidents, to reduce their consequences not only to human life, but also to the environment. Given the SEVESO I framework and the specific types of installations that includes, the new Directive takes into consideration the presence of hazardous substances in sufficiently large volumes that can create a hazard when a major accident occurs, including the ones that are classified as '*threatening for the environment*', such as a critical emission, fire or explosion [17]. SEVEZO II Directive sets out the criteria for defining a major accident that relates to the substances involved, the human casualties and nuisances, the damage to the environment, the material damage and the cross-border effects. The Hellenic Ministry of Environment and Energy is responsible to inform the European Commission about the major industrial accidents that occur in Greece (database Major Reporting System - MARS) [18], [19].

Therefore, SEVESO II Directive aimed to include,

besides hazards imposed by industrial activities, evaluation of hazards concerning storage of such chemicals. Storage stands for the existing volume of hazardous chemical substances for warehousing, depositing in surveillance or retaining a stock. This Directive shall derogate from applying to storage facilities, military establishments or installations, possible risks generated by ionizing radiation, or the transportation of hazardous substances and intermediary short-term storage [20].

SEVESO II Directive was amended on 16 December 2003 with the Directive 2003/105/EE [21], in terms of reinforcing safety and control standards, widening of the scope, additional limiting of water and atmosphere emissions boundaries and gaining attention and feedback of employees and trade unions concerning constitution of health and safety committees. In Greece, this new SEVESO II directive (Directive 2003/105 / EC), which amends Directive 96/82 / EC with the K.Y.A. 12044/613/2007 - Definition of measures and conditions for dealing with the risks of large-scale accidents in installations or units, due to the presence of hazardous substances, is in compliance with the provisions of Directive 2003/105 / EC "amending Directive 96/82 / EC Regulation on the risk of major-accident hazards involving hazardous substances "of the European Parliament and of the Council of 16 December 2003 as a Replacement of no. 5697/590/2000 of joint ministerial decision (405 / B / 29/03/2000) [18].

SEVESO III Directive was issued on 4th July 2012 [22], incorporating mostly the Union's legislation regarding classification of chemicals but also integrating with other European Union policies, such as the "*Civil Protection Mechanism, Security Union Agenda*" (CBRN-E), the protection of critical infrastructure, the protection of environment through environmental liability policies and criminal law, as well as the safety of offshore gas and oil operations, avoiding thus double regulation or other administrative burden [23]. Greece has incorporated SEVESO III Directive and its prerequisites into its national legislation by issuing KYA 172058/11/02/2016.

The Directive has a wide field of application in more than 12.000 industrial sites in the European Member States where chemicals and/or other hazardous substances are stored or used in large volumes, mainly in the industry of chemicals and petrochemicals, as well as in fuel trade and storage (including LNG and LPG) sectors. Due to the SEVESO Directive, European Union has achieved a low rate of occurrences of severe casualties considering its exceedingly high rate of industrialization. This Directive, therefore, is generally recognized and accepted as a benchmark for practices concerning industrial accidents and it's been used as a standard for legislation in numerous countries worldwide [23].

4. ADR, RID, ADN rules and laws enacted in Greece

The rules for transportation of hazardous commodities have been established through international organizations, that have a long experience and knowledge in the sector of land transport. These are known as the International Carriage of Hazardous Goods by Road (ADR), the International Carriage of Hazardous Goods by Rail (RID) and the International Carriage of Hazardous Goods by Inland Waterways (ADN).

The European Agreement concerning ADR was established at Geneva in September 1957 under the supervision of the United Nations Economic Commission for

Europe (UNECE) and was fully applied in January 1968 [24]. The Agreement initially was amended by the amending article 14 (3) of the 21 August 1975 Protocol, in New York, and was activated in April 1985. The European Agreement ADN was issued at Geneva in May 2000 during a Diplomatic Conference organized Central Commission for the Navigation of the Rhine (CCNR) and UNECE. It entered into force on 29 February 2008 [24]. Both Agreements are regularly reviewed and updated in order to comply with technological development and ensure proper safety.

Regarding ADR Agreement, the key point in the agreement itself is that besides some excessively hazardous goods that already their way of safe transporting has been foreseen, there are other hazardous commodities in the international carriage by road vehicles that need to be included. Therefore, the agreement is divided in two Annexes, one (Annex A) specifying the conditions the goods must be laid such as packaging and labeling and a second (Annex B) that defines the carrying vehicle specifications such as condition of construction, installed equipment and operation. A revised consolidated version, containing amending Annexes A and B, has been issued as a unified regulation titled ECE/TRANS/275, Vol. I and II [25], on the 1st of January 2019.

The structure of this regulation is aligned with the one of the United Nations regarding Recommendations on the Transport of Hazardous Goods, Model Regulations, Regulations regarding the International Carriage of Hazardous Goods by Rail (by the Intergovernmental Organization for International Carriage by Rail), the Technical Instructions for the Safe Transport of Hazardous Goods by Air (by the International Civil Aviation Organization), as well as the International Maritime Hazardous Goods Code (by the International Maritime Organization). RID Agreement is a part of ADR Agreement.

The ADN Agreement comprises of the main Regulation and its Annexes and intends to ensure full assurance through international carriage of hazardous commodities by the means of inland waterways; to concur efficiently to the shield of the environment by averting any impurity caused by accidents or incidents taking place during transportation; and to ease carriage operations and to promote international wholesale in hazardous goods [26]. Regarding ADN regulation' annexes, they contain definitions of hazardous substances and their chemical particles, provisions for their delivery in packages and in bulk, as well as specifications and provisions for their transportation onboard inland navigation vessels or tank vessels and the manufacture and performance of such vessels. Additionally, these annexes regulate inspections' protocols and requirements, and they address the issuance of approval certificates. Moreover, they address issues such as recognition of classification parties, monitoring performance and training. The annexed Regulations were not applied till 12 months after the commencement of the agreement in February 2009 [26]. Provisions related to the classification parties' recognition, being the only exception, have been applicable since the Agreement entered into force.

Just before the enforcement of the ADN Agreement in European Union, in May 2000, a Joint UNECE and CCNR Experts' Meeting issued updated annexed Regulations have been issued by a Joint Meeting of Experts of the UNECE and CCNR, in accordance with the resolution adopted by the Diplomatic Conference [20]. Despite the fact that the Agreement had not yet been fully applied, consolidated versions of the updated annexed regulations (ADN 2003 [21], 2005 [22] and 2007 [23]) have been issued by the secretariat

in order to illustrate the articles and data of the Joint Meeting, for any interested Government that may voluntarily implement it. The ADN Agreement has been amended through the years and its last consolidated version of 2013 defines the role of the Joint Meeting experts that now are taking up the position of the Safety Committee as anticipated in the article 18 of the Agreement. All Member States shall seek information and support regarding application of the regulation throughout their national Competent Authority.

The European Union's purpose was to publish specific directives with rules that can later be enforced to Member States' national transport as they already apply to carriages between them. After the embracement and adoption of the new inland transportation of hazardous goods framework (2008/68/EC of 24 September 2008), the legislation in the European Union is unified and covers road, rail, and inland waterways carriage under one Directive. For improving safety in transportation, the Directive 1999/36/EC [31] was issued by the European Union in April 1999, as regards to transportable pressure equipment used for inland carriage of hazardous substances by road and/or by rail, aiming to establish free distribution of this equipment within the members of the Community.

In Greece, the harmonization of national legislation with EU directives has been achieved gradually. At first, the ratification of the ADR agreement took place with Law 1741/1987. Later, with 50941/40/1990, the revised text of the European Agreement was accepted, with 71538/2868/1997, the revision of 1995 was accepted, and with F.101 / 40062/4881/2007, the 1993 amendment protocol was accepted and the following years, harmonization with Directives was established. Decision 2003/635 / EC gave Member States for the first time the possibility of issuing certain derogations from the Annexes to Directive 94/55/EC (as in force) regarding the transportation of hazardous goods / substances by road. Pursuant to the above decision, the 73799/3620/2003 (Government Gazette B '1906/2003) was issued "Technical specifications of vehicles already in circulation that carry out national transport of certain categories of hazardous goods". The Framework Directive 2008/68/ EC on internal transport incorporates, in its annexes, which are amended every 2 years, the derogations along with the ADR and RID. The EU Commission annually issues derogatory decisions with the participation of any Member State wishing to do so. For Greece, the deviations from the ADR at the national level are extended until 30/6/2016, according to the decision (EU) 2015/974, as included in Annex I.3 of et seq. 20655/2897/2015 (Government Gazette 1495 / B' / 2015). Deviations for Greece are set out in EU Decision 2016-629.

In Greece the ADR/RID 2013 version is applied since 07 October 2013, by the KYA 40955/4862/2013 transposing the ADR/RID Directive "Adaptation of the Greek Legislation to the provisions of Directive 2012/45 / EU on the inland transportation of hazardous goods". In accordance with the aforementioned legal framework, companies that transport, pack, load, fill or unload hazardous substances by road and/or by rail, should appoint a "Hazardous Goods Transportation Safety Advisor (DGTSA)", which appoints the company responsible for the prevention of risks concerning the environment, people and property, associated to its undertaking activities. The DGTSA's receive appropriate certification according to legislation, through exams after finishing the corresponding training.

The role of the DGTSA is set out in Section 1.8.3 of Regulation 20655/2897/2015 "Adaptation of Greek

legislation to the provisions of Commission Directive 2014/103 /EU” of 21 November 2014 on the third Adaptation to the scientific and technical progress of the European Parliament Directive 2008/68 / EC as well as the Council directive regarding the inner transportation of hazardous goods and codification [32] and Articles 10-15 of the above that constitute its regulatory framework. DGTSA is a person that can adequately provide advice, guidance, and compliance with the law and can issue an annual report on companies that transport, pack, load, fill or unload hazardous goods by road. Each relevant company is obliged to have appointed one or more DGTSA whose duties are provided in paragraph 1.8.3.3 of ADR 2015. DGTSA receives a professional training certificate from the competent authority in our country which is the National Technical University of Athens.

5. Environmental Policy

In European Union, the first attempt regarding tort liability was initiated by the *Green Paper*, which was formulated in Lugano Convention of 1993. The *Green Paper* indicates that tort liability is vastly related to insurance issues and this relation points out the way that insurance problems are associated with a possible economic loss and can be used as a means to control the relevant risks. With this document, insurance is acknowledged as a major compensation leverage in inadvertent damage incidents where the applied insurance policies cover the restoration expenses. Regarding responsibility and how it is distributed, the insurance issue is a significant factor, since recent environmental laws tend to consider insurance as mandatory, mainly for companies with activities that could be considered as particularly hazardous for the environment [33].

Pursuant to the *Green Paper* in 1993, the *White Paper on Environmental Liability* was issued in 2000, aimed to identify how the polluters must reimburse for their actions and how this principle can be implemented within the Community’s environment policy. The *White Paper on Environmental Liability* of 2000 emphasizes on the environmental aspects and aims to set terms for shaping the environmental liability within the Community taking in account rules and policies set by the EC Treaty [34]. After the White Paper was issued, a public deliberation started in order the European Community be able to establish a Community Directive that will define and apply a common framework for an environmental liability scheme. Therefore, in April of 2004, the “*Environmental Liability Directive*” (ELD) was issued [35].

This Directive (2004/35/EC) defines the principles that anyone that pollutes must pay accordingly and bear the corresponding liability when an environmental damage or accident occurs. This framework has already been introduced in Maastricht Treaty [36], but with the formulation of the ELD, the members of the European Community are allowed to adopt course of action in accordance with the subsidiarity principle as presented in Article 5 of the Treaty. The Directive’s main objective is the provision of a common framework for environmental damage prevention and remedy at a reasonable cost for the society. For this, ‘environmental damage’ may be considered as either damage to protected species and their natural habitats (which may have a severe effect on their sustainability), water damage (affecting significantly the water quality and quantity) or land damage, that has to do with any land contamination imposing critical risk on human health.

In Greece, through Greek Constitution of 1974, Article 24

was incorporated that the protection of the natural and cultural environment is an obligation of the state, whereas “*the polluter pays*” principle applies. Particular emphasis was also placed on the prevention of the environmental pollution. National Environmental Policy is harmonized with the corresponding Community institutional framework and focuses on maintaining the purity of water, air and soil, urban and industrial wastewater treatment waste, disposal and utilization of solids and liquids waste, protection from noise and/or radiation and preservation of landscape and cultural heritage [37]. Besides regulations and laws regarding environmental protection, the establishment of environmental systems standards management, such as ISO 14000 will allow organizations to operate by implementing systems - mechanisms to avoid or early detect possible environmental violations.

The Environmental Liability Directive commenced in April 2004. The harmonization deadline for the Member States was set to three years. Till 2008, only 65% of the Member States had fully interchanged the Directive into domestic law. In Greece, the Directive was transposed into domestic law by Presidential Decree 148/2009 (Government Gazette, Series I, No. 190/2009) “*Environmental liability for the prevention and remedy of environmental damage – Transposing Directive 2004/35/EC of the European Parliament and of the Council, of 21 April 2004, on environmental damage, as currently in force*”, allocating explicit correspondence between its articles and the articles of the Directive and its Annexes. The P.D. 148/2009 was amended to incorporate Directive 2006/21/EC on the waste extractive industries management as well as amending Directive 2004/35/EC [38], to define administrative organization and implementation of financial guarantee [39] and to include terms and principles referring to geological storage of carbon dioxide [40]. Independent Coordination Office for the Implementation of Environmental Liability (ICOIEL) has been appointed as Competent Authority for Greece under the supervision or the Hellenic Ministry of Environment and Energy and supported by the Committee for the Implementation of Environmental Liability (CIEL). Both ICOIEL and CIEL are located and based in Athens, and they are collaborating with the Hellenic Environmental Inspectorate (HEI) to address any incident that may occur in Greece [41].

In this Directive, the term ‘operator’ is defined to be the liable party, can be natural, legal or public person with occupational activity. The operator bears all preventive costs in case of threat and remedy costs in the event of damage to the environment according to Article 8 of the Directive. Pursuant to the exceptions of the Directive (Article 8.3, 8.4), the operator may not be entitled to compensate for the damage in case third parties are involved or when *force majeure* or armed conflict is demonstrated, or when national legal framework of the Member States imposes regulatory compliance. All European countries have significant optional choices regarding the severability of the adopted measures or their decision on using or not defenses provided by the Directive.

6. Conclusions

As analyzed in the above sections, regulations, laws and provisions regarding hazardous substances are characterized by a global extent. It is the world’s constitutions’ responsibility to develop and monitor rules and regulations

that States will be able to apply and transpose into domestic laws. The difficulty that is acknowledged is that numerous regulations and directives exist trying to comprehend diverse states characteristics. For example, when new countries enter the European Union, different principles apply, such as land diversities (rural areas or intensive agriculture) or countries with adverse industry that need more intense regulatory compliance or financial support more than others. Scholars often deal with the definition of the optimal way of imposing terms for environmental protection. The critical question is whether the rules are most effective at national, European or international level.

In this paper, an attempt to associate the national regulations with the European Directives and to identify their interoperability was made. For example, in order to submit a safety study for an installation that falls under the provisions of SEVESO regulation, all competent authorities will evaluate it based on the corresponding regulations that need to be verified. In this case, a safety study must comply with CLP regulation for classification of hazard substances, with the REACH regulation for the impact on human health, and with ADR, RID or AND regarding their transportation. In this perspective, all kind of such legislation must include specific terms properly and effectively defined, in order to be widely interconnected. From the UN initial legal framework up to the transpose of European Community's directives to domestic legislation, these terms required a global approach, a way to be introduced in different countries and still have the same meaning. These common patterns were identified globally as technical terms definitions that mean the same in all countries and this is the way to standardization that offers

typical and comprehend legal framework.

The real difficulties appear when the implementation arises, since there is a great difference between studying and acting. The theoretical basis of the legal framework and its interpretation into action points can be very different between countries. The implementation of the directives depends on many factors such as the background of the country, its ability to develop an adequate juridical system or to enhance its people's participation and empathy. Therefore, implementation process may vary even between European countries. As described earlier, Greece seemed to lag to the implementation of Directives into national legislation. Up to now, total compliance has not been achieved. Although significant actions have been undertaken, distortions can arise and interfere with the efficient application of the legal framework. Inefficient monitoring of processes and operators, lack of sufficient financing and lagging of concluding of juridical cases are some of the important difficulties for the implementation of laws and directives and probably differences between Greece and other European countries.

Concluding, it should be pointed out that the historical recursion of European regulations is considerably valuable. It reveals the reasons and the need for alteration and amendment and can be sustainably used for future development, given the gained experience up to now and the technology contribution to supervise and act when appropriate.

This is an Open Access article distributed under the terms of the Creative Commons Attribution License.



References

1. <https://www.gepgroup.gr/en/adr-rid/>, accessed on 03/09/2021
2. European Commission, Environment Directorate General, "Reach in Brief", p.p.3 (2007)
3. European Commission, Regulation (EC) No 1907/2006, amended by Regulation (EC) No 1272/2008
4. <https://echa.europa.eu/regulations/reach/understanding-reach>, accessed on 03/09/21
5. European Commission, Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labeling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006
6. http://www.unece.org/trans/danger/publi/ghs/ghs_welcome_e.html, accessed on 04/06/2020
7. <https://osha.europa.eu/en/themes/hazardous-substances/clp-classification-labelling-and-packaging-of-substances-and-mixtures>, accessed on 04/09/2021
8. General Chemical State Laboratory Report, "New Regulation 1272/2008/EK" at www.gcsf.gr accessed on 15/09/2021
9. M. Chalaris, Lecture Notes on "Risk classes and categories, pictograms, hazard statements, precautionary statements. Comparison with existing legislation", International Hellenic University (2020)
10. European Commission Regulation (EC) No 1272/2008 of 16 December 2008, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006
11. http://www.gcsf.gr/index.asp?a_id=150, accessed on 03/09/2021
12. European Commission, Directive 82/501/EEC Art.3
13. European Commission, Council Directive 82/501/EEC of 24 June 1982 on the major-accident hazards of certain industrial activities, OJ L 230 (1982)
14. European Commission, Council Directive 96/82/EC of 9 December 1996 on the control of major-accident hazards involving hazardous substances, OJ L 010 (1997)
15. A. Brugnoli, Hazardous Materials: Control, Risk Prevention and Crisis Management. NATO Science for Peace and Security Series C: Environmental Security, Springer (2010)
16. European Commission, Directive 96/82/EC Art. 23 provided for the repeal of Directive 82/501/EEC twenty-four months after the entry into force of the new Directive.
17. European Commission, SEVESO II Directive Art.2
18. M. Chalaris, Lecture Notes on "Presentation of a basic legal framework regulating industrial facilities and companies' issues", Hellenic International University (2020)
19. M. Christou and G. Papadakis, Risk Assessment and Management in the Context of the Seveso II Directive. Ministry of Environment, Physical Planning and Public Works (1998)
20. European Commission, SEVESO II Directive Art. 4
21. European Commission, Directive 2003/105/EC, O.J. L345/97
22. European Commission, Directive 2012/18/EU, O.J. L197/1
23. <https://ec.europa.eu/environment/seveso/>, accessed on 03/09/2021
24. https://www.unece.org/trans/danger/publi/adr/adr_e.html, accessed on 03/06/2020
25. United Nations, European Agreement concerning the International Carriage of Hazardous Goods by Road (ADR) (2018)
26. United Nations, European Agreement concerning the International Carriage of Hazardous Goods by Inland Waterways (ADN) (2017)
27. United Nations, Economic and Social Council, Report of the Diplomatic Conference, Addendum 1, ECE/ TRANS/ ADN/CONF/10/Add.1, (2000)
28. https://www.unece.org/trans/danger/publi/adn/adn2003/03files_e.html, accessed on 03/09/21
29. https://www.unece.org/trans/danger/publi/adn/adn2005/05files_e.html, accessed on 03/09/21
30. https://www.unece.org/trans/danger/publi/adn/adn2007/07files_e.html, accessed on 03/09/21
31. European Commission, Council Directive 1999/36/EC, O.J. L138
32. 35043/2524 (Government Gazette 1385 / B / 2010), 52280/4720 (Government Gazette 2640 / B / 2011), 52167/4683 (Government Gazette 37 / B / 2012) and 40955/4862 (Government Gazette 2514 / B / 2013)
33. B. Pozzo, Hazardous Materials: Control, Risk Prevention and Crisis Management. NATO Science for Peace and Security Series C: Environmental Security, Springer (2011)

34. European Commission, White Paper on environmental liability, 66 final Economic Commission for Europe, Inland Transport Committee, Diplomatic (2000)
35. European Commission, Directive 2004/35/EC 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, in Official Journal 30 April 2004, L 143.
36. Treaty establishing the European Community (Nice consolidated version) - Part Three: Community policies - Title XIX: Environment – Article 174 - Article 130r - EC Treaty (Maastricht consolidated version) - Official Journal C 325 , 24/12/2002 P. 0107 – 0108 Official Journal C 340 , 10/11/1997 P. 0254 - Consolidated version Official Journal C 224 , 31/08/1992 P. 0052 - Consolidated version
37. M. Chalaris, Lecture Notes on “Technological Disasters and Environmental Risks”, International Hellenic University (2020)
38. Joint Ministerial Decision (JMD) 39624/2209/E103/2009 (Government Gazette, Series II, No 2076/2009)
39. Law 4014/2011 (Government Gazette, Series I, No 209/2011) for the "Environmental authorization for works and activities... and other provisions " within the competence of the Ministry of Environment
40. JMD IP 48416/2037/E.103/2011 (Government Gazette, Series II, No 2516/2011)
41. The Head of ICOIEL, Report on the Implementation of Directive 2004/35EC in Greece, Ref.518 (2013)