

## IS ENVIRONMENTAL PROTECTION A CENTRAL ISSUE TO THE BUSINESS STRATEGY OF HIGH PROFILE COMPANIES? CONTENT ANALYSIS OF WEBSITE CORPORATE COMMUNICATION

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**Abstract:** The paper focuses on exploring the way high profile companies with direct environmental impact use the website corporate communication to report on their environmental policies and practices. Employing a semantic analysis based on computer-aided techniques (VOSviewer), the paper aims to identify the themes revealed by the terms' frequency and co-occurrence from sustainability reports that indicate how central environmental protection is integrated to business strategy. The findings pinpoint to substantial differences of approach regarding the extent and content of environmental disclosure. State-owned enterprises and privatized firms display poor environmental reporting due to their long past of non-accountability and the weak motivation to engage in legitimacy building. On the contrary, MNEs are aware of the role of corporate communication in enhancing organizational legitimacy, thus their reporting encompasses a wider range of issues related to environmental protection. Corporate disclosure is well-structured in three major themes regarding environmental policy, environmental management system and social impact. Although MNEs acknowledge their environmental footprint and show a strong commitment to reduce the negative externalities, the themes relevant to the environmental management system display less connectivity and semantic coherence.

**Key Words:** *environmental protection, polluting firms, business strategy, corporate communication, Romania.*

### Introduction

Romania has a strong legacy of environmental sensitive industries dating back from the end of the Second World War when the mechanisms of centrally-planned economy started to be firmly put in place. Industrial hazardous emissions are, at a large extent, responsible for air pollution and the hypertrophy of heavy industries serving COMECON markets has contributed to enhancing the environmental degradation in the long run (Schwab and Stoian 2009). The political turn in the early 1990s and the openness to the global economy generated expectations that the environment would be the primary beneficiary of the on-going economic changes. Several assumptions converged to supporting this view: the technological transfer from the West helping to mitigate the environmental damage; the industrial restructuring and re-balancing of the economic structures away from heavy industries (Schwab 2016); and, the increased efficiency of industrial firms searching to gain access to the global market. Recent assessments of air pollution show that these expectations were too high. On one side, legislation failed to deliver effective pollution controls and on the other side, the slow-down in the economy contributed to reduce the scale of environmental damage, but rising unemployment helped to breed a survival mentality which had made the public wary of supporting radical environmental programs (Dragomirescu et al. 1998).

Despite the dismantling of basic industries and rationalization of production in the last two decades, industrial firms have a significant contribution to environmental damage and Romania was ranked the 6<sup>th</sup> among the EU-27 in terms of the damage costs to health and environment resulting from pollutants emitted by industrial firms (European Environment Agency 2011). When GDP is used as an indicator of national production to normalize the damage costs against the level of services generated by the national economy, Romania is placed on the 2<sup>nd</sup> position in the EU-27 due to the lower power of the government to deal with air pollution. A recent survey of the European Commission (2014) shows that the Europeans (Romanians included) share a high level of awareness of environmental issues and consider that the measurement of the progress should be based equally on social and environmental criteria besides the economic criteria. In particular, the Romanians state that air pollution is ranked first amongst the issues and they feel mostly lacking the necessary information on it. Additionally, they consider that the protection of the environment can boost economic growth and that big companies and industry are not doing enough to reduce environmental damage. Public perception is high on environmental issues and especially on those related to industrial air pollution, suggesting that there is a serious gap between the societal expectations and the business performance.

Environmental responsibility and communication is increasingly becoming a mainstream issue for business, governments and society in transition economies. Firms are expected to operate within the boundaries and norms valued by the society, so their activities are perceived as legitimate and firms' image and reputation are not threatened. They have to convince the public that they are „responsible” agents working for the benefit of communities and the environment.

Corporate documents are distinct in that they are designed to persuade the audience (stakeholders, local communities) of business concerns related to environment. Thus, it is possible to understand how environmental policy and management system are defined and used by observing the frequency and relatedness of associated key terms. Within this context, the paper aims to explore the way high profile companies with direct environmental impact use website corporate communication through non-financial reports to express their environmental policies and practices. In order to achieve this goal, semantic analysis based on computer-aided techniques (VOSviewer) is looking to gain insights into the main themes related to environment and, therefore, to compare the similarities and differences between the top polluting companies in terms of environmental disclosure. The paper is structured in the following sections: the literature review is aiming to reveal the findings of extant literature on corporate environmental communication; then the research method by which the companies are analyzed and the justification of the sample selection are outlined; finally, the findings and the discussion report on the cluster mapping of environmental disclosure.

#### *Literature review*

Interest in environmental communication is growing worldwide (Cox and Pezzullo 2016). The environmental communication strategy is part of the firms' environmental management system and it has evolved recently as one of the fastest growing area of academic inquiry. Environmental communication is used by governments, companies and the public as a symbolic medium in constructing environmental issues and in negotiating the society's responses (Cox 2013).

Environmental communication has a constitutive and pragmatic character. On one side, it helps composing and constructing representations of nature and environmental concerns enabling the logical chain of subjects, problems and values to become central to our understanding and action. On the other side, environmental communication helps solving the environmental problems and it contributes to the public education. Within the legitimacy theoretical framework, companies disclose their environmental targets, risks and performance aiming to enhance the

communication of information relevant to their stakeholders' interests (Solomon and Lewis 2002) and to shape the stakeholders' views and expectations on the environmental responsibility practiced by companies (Gray et al. 2009). Such communication invites a particular perspective, it evokes certain values and it creates conscious referents for public understanding (Cox 2013). Cox and Depoe (2015) demonstrate the rapid expansion and diversification that environmental communication has experienced in the recent decades by focusing on four emerging issues: climate change communication, sustainability science, 'imaging of nature' and the problematizing of the human/nature binary.

Previous research focused on national case studies or on an international sample of companies in the attempt to measure disclosure and to investigate the determinants based on binary scores (Andrikopoulos and Kriklani 2013). They analyze two main categories of firms: listed companies with large market capitalization (Kolk 2003, Lodhia 2006, Zhang et al. 2007, Chatterjee and Zaman Mir 2008, Creel 2010) or companies belonging to specific industrial sectors (Rodríguez Bolívar 2009) in different contexts where the emphasis on the environmental effects of business activities is either a long-standing concern or in an early stage. There is an increasing awareness of environmental issues at the international level, but the extent of environmental disclosure varies according to the institutional context of business activity and corporate reporting (Kolk 2003).

Although there is a lack of standardized corporate practices of environmental disclosure (Rodríguez Bolívar 2009), these studies found relationships between environmental reporting and the size of companies (Cormier et al. 2005), industrial membership (O'Dwyer 2003, Rodríguez Bolívar 2009) and profitability (Brammer and Pavelin 2006). Findings also refer to the relationship between environmental disclosure and high profile companies with direct environmental impact. Companies belonging to environmentally sensitive industries tend to communicate on their corporate websites more extensive sustainability information (O'Dwyer 2003, Brammer and Pavelin 2006, Buniamin 2010). Environmentally "challenged" companies focus their reputation building strategy mainly on preserving/repairing legitimacy (Dragomir 2010).

Environmental reporting has been recently adopted by the industrial organizations in Romania. Previous studies on corporate responsibility and communication in Romania argue that the environment is the second-ranked priority area for action for more than half of the 100 top companies (Băleanu et al. 2011), but environmental communication is incomplete and irrelevant to the users (Ienciu et al. 2011) although the Romanian companies are aware of the financial advantages brought by the disclosure of non-financial information, including environmental communication (KPMG 2011). In the same time, research advocated the need for real corporate social responsibility programs instead of engaging in philanthropic initiatives in the attempt to build a positive image (Jindrichovska and Purcărea 2011).

### **Methodology**

In its 2011 Report, the European Environment Agency ranked the most polluting firms across Europe listing 622 companies that contributed to the 75% damage costs of air pollution (European Environment Agency 2011). Among them, 22 companies are located in Romania and they represent the sample of this analysis. They display various employment size, industry membership, scale of production and organizational form by the type of capital (State-owned Enterprises – SOEs, privatized firms and Foreign Direct Investment – FDIs). Their position as top industrial polluters was reconfirmed by the EEA Report issued in 2014 (European Environment Agency 2014) that provided a synthesis for the 2008-2012 period. Twelve of the companies are listed within the Top 100 most valuable companies in Romania.

The analysis sample is made up of 12 state-owned enterprises – SOEs (Complexul Energetic

Turceni, Complexul Energetic Rovinari, Sucursala Electrocentrale Isalnita, RAAN Romag Termo, SC Electrocentrale Deva SA, Sucursala Electrocentrale Craiova II, SC CET Govora SA, SC Electrocentrale Oradea SA, Sucursala Electrocentrale Paroseni, SC CET Arad SA, CET Bucuresti Sud, SC Centrala Electrica de Termoficare Brasov SA ), 2 privatized firms (SC Azomures SA, SC Amonil SA Slobozia), 6 West European-based multinational enterprises – MNEs (SC Arcelor Mittal Galati SA, OMV Petrom SA Petrobrazi, Cement Roadstone Holdings Hoghiz, Cement Roadstone Holdings Medgidia, Lafarge Holcim Campulung, Lafarge Holcim Alesd) and 2 Ex-Soviet space-based MNEs (SC Petrotel Lukoil SA, SC Rompetrol Rafinare SA -Kaz Munay Gas International).

The research method is the content analysis based on the application of VOSviewer. This is a java-based program initially developed for constructing and viewing bibliometric maps (Van Eck and Waltman 2010). It combines the VOS mapping technique and an advanced viewer into a single computer program that is freely available. More recently, the program was used as an efficient and accurate tool for content analysis in a wider range of disciplines and fields of research (political discourses – Albaugh et al. 2013, policy documents – Derrick et al. 2014, cross border cooperation documents – Cojanu et al. 2016, corporate communication – Grigore et al. 2015) as well as academic articles and editorials (Derrick et al. 2014).

Applying VOSviewer to the analysis of policy documents in the UK regarding the conceptualization and understanding of the term “impact” of scientific research, Derrick et al. (2014) found out that there is a lack of transparency related to the content of the definition of impact. The authors advocated the use of VOSviewer to the analysis of government policy documents because it can identify key phrases independent of being related to the argument constructed within the text. Additionally, “it is possible to discern how key noun phrases are defined and used within the text by observing those words clustered together, and/or closely associated” (Derrick et al. 2014: 153).

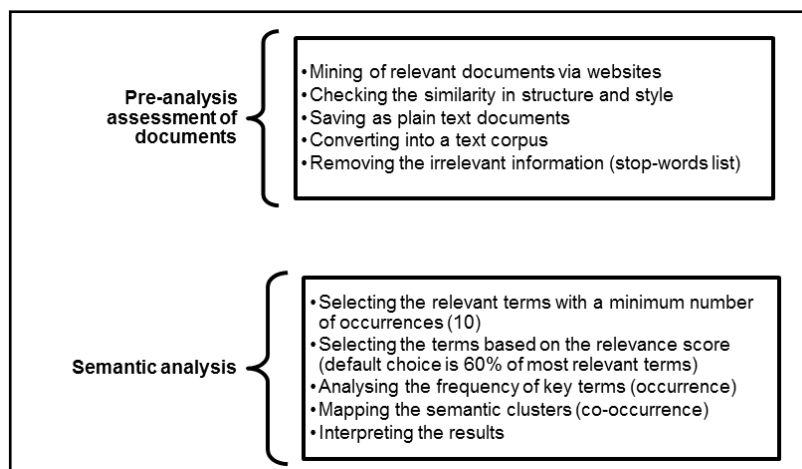
The analysis of cross-border cooperation documents issued by various Regional Councils in Europe enabled the identification of models and strength of cooperation in three areas: economic, social and environment (Cojanu et al. 2016). The most frequent words that were found in all CBC refer to official names of organizations showing the interest for a formalized relation of cross-border cooperation and for a careful planning of the objectives and their achievement.

A growing body of literature uses VOSviewer for investigating the corporate communication on websites. The disclosure of three pharmaceutical companies was the focus of semantic research enabled by the use of VOSviewer and it pinpointed the differences in strategic approach, the corporate response to the stakeholders’ interests and expectations, and the commitment to engage in responsible activities (Grigore et al. 2015).

The diversification of uses started from the assumption of communication studies that the meaning of communication frames itself on words, among which complex relations exist. VOSviewer employs a linguistic filter to select the most relevant noun phrases helping the identification of thematic clusters. The analysis of various corpora of texts identify clusters of words based on their occurrence and relatedness (co-occurrence). The analysis focuses on explaining the semantic of the text by looking at the relationships between the terms based on their proximity within sentences and paragraphs. Connections between the terms and the distance between them are potential indicators of the way organizations construct their messages, whether they use the same terms in similar contexts and prefer a certain type of discourse. In this way, the words are hierarchically associated and the spatial proximity within various sections of the text determines semantic fields. These are visualized as maps or graphical charts where the size of the circle reflects the number of occurrences while the

relative distance between the terms shows the relatedness among them.

Before using the VOSviewer, relevant documents are sourced, usually via websites, and saved as plain text documents and then converted into a text corpus for analysis. To increase the validity of the results, a number of checks are carried out. The documents are analyzed in order to ensure that they are similar in structure and style. The pre-analysis assessment of documents guarantees that the analysis run by VOSviewer would be robust and that it yields representative results (Derrick et al. 2014). A stop-words list is used to remove the irrelevant information (common words, place names). The words with a minimum number of occurrences of 10 are further analyzed in terms of proximity and relatedness (Fig. 1).



**Fig. 1 – Description of the research method – content analysis based on the application of VOSviewer**

### **Results and Discussion**

A number of 14 documents directly (environmental policy, integrated management system, sustainability report, corporate responsibility report) or indirectly (strategy, mission, vision, values) related to environmental communication were sourced from the corporate websites and prepared for the semantic analysis using VOSviewer. The analysis of all three different groups of firms distinguished by the origin of capital investment (SOEs, privatized firms and MNEs) failed because of the low level of convergence of environmental reporting of these categories of companies. More precisely, the breath and content of corporate communication vary at a large extent between the former two groups and the latter undermining the validity of the results. Therefore, the analysis was carried out for each group separately.

Environmental disclosure of SOEs is spread across various sections of the Menu, from Environment, Quality and Environment, Integrated Management to Social Responsibility. Environmental information is also found under additional headings, such as: strategy, mission and vision. Most of the SOEs display a short statement of the top management (approximately one page) regarding the environmental policy. Equal weight is given to environmental objectives, quality, occupational health and safety, suggesting a comprehensive outlook that links environmental protection with social and economic performance. The policy statements follow a patterned model with a high level of content standardization and uniformity.

Among the objectives, varying from five to ten, those related to environment either focused on pollution reduction or targeting a wider range of environmental issues. Word clustering identified two words relevant by the number of occurrences found in the documents uploaded by SOEs on their websites (*environment and quality*), whereas the privatized firms focused their disclosure on *environment and integrated management system*. Public and privatized companies design an environmental policy and institutionalize environmental management systems supporting their commitment to govern their operations through an environmental policy and to translate their policy into practice by integrating their environmental concerns throughout functions, processes and activities. Environmental policy, as a part of the integrated management system, plays a strategic role for the organizational development of SOEs and privatized firms. However, none of them presents in detail their management system. Even if these companies use a certain type of rhetoric to persuade that they are committed to improve the environmental performance, the lack of information regarding the corresponding management system questions whether they carry out their environmental policies. The content of the environmental reporting shows that the statements and the overall argument structure are poorly linked.

In contrast with SOEs, MNEs reporting is more extended and better structured. Anyway, the approach and issues addressed differ largely by the home base and experience of working in regulated business environments. The environmental disclosure is streamlined along different headings: policy, integrated management system, strategy, responsibility report, sustainability report or a combination of these, either targeting the environment or embracing the whole range of corporate responsibility areas (quality, occupational health and safety, environment). The documents disclosed by MNEs contain 3 259 terms out of which 80 meet the threshold (minimum number of occurrences of a term is 10). Forty-eight terms were selected based on the relevance score (the default choice is to select the 60% most relevant terms).

VOSviewer combines the quantitative analysis to assess the occurrences of the terms and, implicitly, their relevance, and qualitative methods based on the co-occurrences for mapping the clusters of terms. The cluster analysis based on their size and composition is aiming to answer several questions: which is the central term for each cluster? How is the cluster structured? Which terms are connected and which are not? What terms are missing and why?

*The frequency of key terms*

The terms most frequently used suggest that environmental disclosure of MNEs is streamlined along three major themes and corresponding terms (Table 1).

Table 1

**Major themes and relevant terms of environmental disclosure**

<b>Major themes</b>	<b>Relevant terms</b>
Environmental policy	Emission (85), reduction (46), production (40), waste (38), material (35), climate change (27), raw material (26), sustainability (17), quality (17), environmental protection (13)
Environmental management system	Project (47), program (24), objective (21), target (26), energy efficiency (26), implementation (16), compliance (16), ISO (15), environmental performance (11)
Social impact	Safety (33), health (26), community (30), stakeholder (26), employee (22), respect (10), society (10)

The first theme shows that the priority of these organizations is to lower environmental impact and it is revealed by terms like *emission, production, reduction, waste, raw material and climate change* which illustrate the major environmental concerns related to pollution abatement, waste

management and challenges of climate change. The wording of environmental disclosure suggests a high level of awareness of the environmental damage caused by the production processes and the subsequent quantity of emissions released into the air, in particular. The commitment to reduce the environmental footprint demonstrates that *environmental protection* is a central goal of the business strategy. Therefore, low impact production methods, updated technology and processes, environmental friendly products focusing on their use and subsequent recycling and waste generation reduction, and the efficient use of natural resources would be among the measures employed in line with the MNEs objectives. Additionally, the concerns regarding climate change are of growing importance. Climate change as a ruling paradigm of environmental strategy seems to be a central issue given that GHG emissions represent a core determinant of their environmental damage.

On the contrary, the term *sustainability* is less approached although it is one of the guiding principles of corporate behavior and an essential factor in enhancing business performance. As a rule, the companies which pursue an environmental policy embrace the concept of sustainable development, therefore a stronger emphasis of sustainability as philosophical underpinning of their policies and practices would have been expected. Designing and pursuing the environmental policy, the companies acknowledge the damage they produce upon environment but also express their commitment to act as responsible agents of change. Nevertheless, the term *responsibility* is missing. The discourse on environment would be centred on the term responsibility (or/and its variants) which is commonly used to characterize the relation between business and society/environment.

The second theme suggests the interest of companies to *implement* the business strategy and a focus on economic and *environmental performance* through *programs and projects*. MNEs seem to master the management processes and practices that enable them to reduce their environmental impacts and to increase their operational efficiency. *Objectives* and corresponding *targets*, measures and timelines lie at the centre of the management system. Having set the environmental requirements, the performance assessment is likely to be done. Usually, the recent achievements and the positive effects for the further reduction of the environmental footprint are emphasized. When the environmental objectives have not been met and the liability is acknowledged, companies would explain the causes in the attempt to enhance the corporate transparency and to stress their commitment to further improvements. On the contrary, omitting to report on key performance indicators that are relevant to stakeholders, including environmental impacts, might be regarded as an attempt to keep the public perception low on environmental damage.

In MNEs' view, *compliance* with the law is a relevant rationale behind engagement in environmental practices and certifications/authorizations (*ISO*) are mentioned as evidence of their capacity to manage the environmental impact while enhancing their credibility. Mentioning a wide range of certifications, environmental permits and inspection reports, provides the framework for establishing and analysing the general and specific environmental objectives pursued at corporate level. Certifications (*ISO*) are essential for companies to continue operating by stressing the credibility of sustainability reports. The companies state their commitment to comply with environmental regulations set at national or EU level while having a major contribution to environmental damage in contradiction with the legal provisions. In this way, companies use their potential to influence the outlook of the stakeholders by directing attention to positive results and creating particular meanings and understandings convenient for their image. Anyway, a number of terms central to fair and accurate environmental reporting are overlooked. For example, reference to thresholds set at the European level beyond which emissions cause air pollution is missing. Avoiding the subject of emissions thresholds, the companies avoid naming the problem of air pollution and its association with values such as health, well-being and economic prosperity. Thus, environmental communication is not used to help composing representations of environmental problems.

Consequently, environmental risk is another term missing in the corporate disclosure together with closely related terms such as identification, management, monitoring, control, and corrective measures. Environmental risks should be identified and further measures aiming at improving performance through environmental risk assessment implementation and quantitative impact analysis have to be outlined. As a rule, targets are set annually and deployed within all business segments and the monitoring of environmental indicators is embedded in the standardized, regular reporting processes. The benefits of conducting a proactive management are widely recognized: it helps to set priorities, make effective environmental decisions, ensure compliance with legal requirements and loss prevention/minimization, as well as raise environmental awareness. MNEs are reluctant to give details on their environmental impact, thus corporate transparency and credibility are negatively affected.

Finally, *safety*, *health* and *community* form another central theme which pinpoint the relationships of organizations and society. Organizations are accountable to a number of *stakeholder* groups in particular with regards to environmental concerns (governmental bodies, local and central authorities, NGOs), but *employee*, *community* and *society* seem to be critical for environmental management efforts of the majority of companies. MNEs are essentially profit-seeking organizations interested in expanding the social acceptance of their operations, especially those that produce negative externalities on their stakeholders and the environment. To this end, they engage in reputation building strategies so that society continues to provide necessary resources such as legitimacy of companies' existence and growth. Therefore, the term *respect* seems to define the quality of the relationships between companies and society. There is a mutual interconnection between the stakeholders' involvement and corporate environmental practices. The actions to involve the community may take a number of forms from philanthropic actions to well-structured many-sided programs that target environmental education, entrepreneurship skills and sustainable community development. Training programs aiming to increase the understanding of environmental footprint and risk management competencies for employees and suppliers would be regularly delivered by companies, especially those with the worst environmental record as the sampled companies are.

#### *The map of semantic clustering*

Besides the quantitative analysis of the frequency of relevant terms that highlight the emphasis of companies on issues related to environmental protection, the qualitative analysis of cluster mapping adds deeper insights into the way companies construct their messages and communicate their environmental concerns. Cluster mapping analysis explains the semantic of the text based on the identification of the relationships between the terms measured by their proximity within sentences and paragraphs. Therefore, cluster mapping is a valuable tool of interpretative analysis for measuring the quality of corporate environmental disclosure and, eventually, it might indicate the type of rhetoric used by companies to enhance their legitimacy.

Several clusters are identified, each made up of a combination of terms that emphasizes a particular approach to environmental issues. The most extended cluster is built around the term "safety". Semantically close are the terms "quality", "respect", and "health". As a rule, companies design an integrated policy on quality, environment, health and safety and, consequently, take an integrated approach on development. Continuous improvement of products, technologies and services pursued by the companies and *compliance* with the law and regulations provide the basis for achieving *environmental performance*. Alongside companies, suppliers and customers are critical in sharing the same environmental standards within the value chain and engaging in environmental practices. One of the main objectives of the integrated policy is to ensure occupational *health* for employees and to respond to the interests and expectations of *stakeholders*. *Society* and *community*, in particular, are targeted by companies' activities, thus they associate environmental issues with corporate *sustainability* and performance.



Another significant cluster is centred on the term “emission” which suggests a high level of awareness of companies’ environmental impact, especially that on the air quality. This central term is closely associated with “production” as the main cause of producing different types of emissions, but also with “reduction” and “target” showing that companies are pursuing actions aimed to reduce the environmental footprint based on pre-determined *targets*. Increasing *energy efficiency* is a priority for companies searching to lower their environmental impact. The term “project” seems to be placed between emission reduction and energy efficiency and energy consumption, suggesting that the actions are multi-directional targeting both production and consumption patterns. A significant semantic coherence is shown by the association of the term “material” with “raw material”, which in a broader sense means natural resources. In the same way, “water” comes next to “water management” and “waste” to “efficiency” which shows a good match of the terms used in the context of materiality. Under this framework, the understanding of the environmental issues is comprehensive including besides the abatement of pollution, the sustainable use of *raw materials*, and *water* and *waste management*. The corporate vision on the environmental policy and practice is envisaged at the level of *group-company*, suggesting the consistency of the approach among production subsidiaries.

Less connectivity is characteristic of the cluster built around the term “project”, closely related to the term *implementation*, although the overall cluster composition suggests a low level of semantic coherence. Environmental protection might be linked to biodiversity, although biodiversity would have been better integrated into the cluster dealing with the environmental issues discussed above. The term *employee* seems to be disconnected from any of the other clustered terms. A similar poorly linked cluster is that putting together the terms *asset*, *ISO* and *objective*. On the contrary, an interesting match is made by the terms “climate change”, “challenge” and “opportunity”. Climate change is both a challenge for companies with a strong impact on environment and an opportunity to develop innovative products and technologies. Sustainability is part of the cluster based on the semantic correlation but relatively disconnected from the group which renders sustainability a peripheral position. The same disconnected location is attributed to the term “implementation”. Moreover, the terms “project” and “program” are placed in proximity but included in different clusters. The terms “objective” and “targets” hold a similar position and they are semantically linked but placed in separate clusters (Fig. 2).

The clusters contain some of the names of the companies in the sample and their role in constructing the messages is emphasized in this way. OMV Petrom is part of the most extended cluster focused on the integrated management system and the related terms of quality, performance, safety and sustainability. The high connectivity and semantic coherence are evidence of a well-structured and clearly conveyed message to the audience. Relationships between the organization and stakeholders (society, community) are given a special focus. HolcimLafarge is connected to the cluster “emission” and associated terms of “reduction”, “target”, “production” and “project”, pinpointing the importance given to the implementation of the management systems. KazMunayGas International can hardly be associated with a coherent semantic cluster, having a rather isolated position between the other more clearly patterned clusters. The absence of Lukoil Romania and ArcelorMittal Galati could be explained by their shorter and less structured environmental disclosure.

#### *Relatedness of the key terms*

The co-occurrence map indicates a well-framed image of sampled companies with some persistent themes within the dimensions of environmental protection. If connections between terms are strong and the distance is small, it shows that they are employed in similar contexts using a common language that reveals a common understanding of environmental concerns. The density of connections between terms summarizes the emphasis of companies on specific issues related to environmental protection. The strongest density reflects the high level of

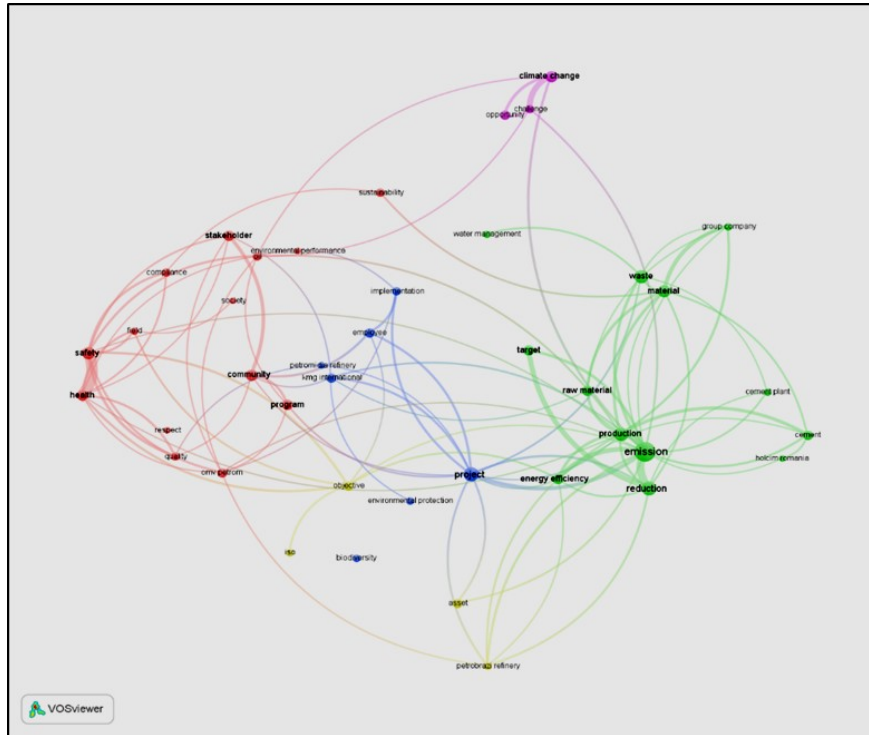


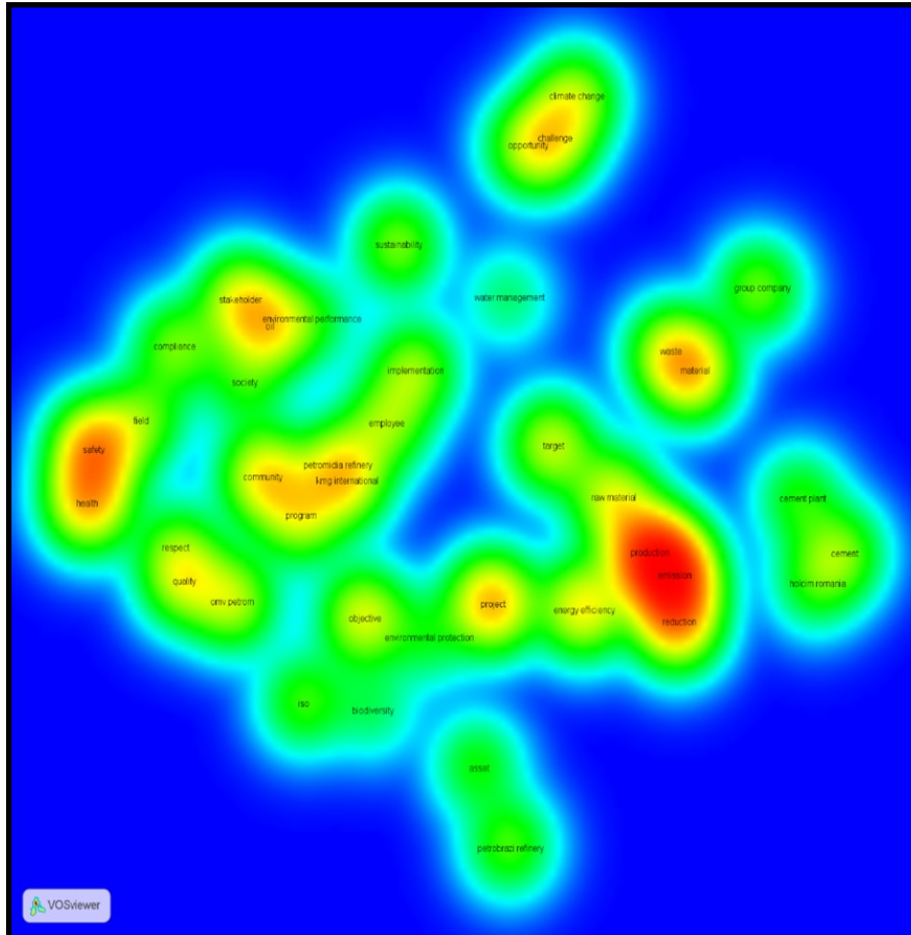
Fig. 2 – Cluster mapping of environmental reporting

corporate awareness of the environmental damage as well as the companies' commitment to engage in pollution abatement by reducing the emissions into the air (Fig. 3). *Safety* and *health* are strongly connected suggesting that the provision of a safe and healthy environment for employees and the community is a priority for the business strategy, given that increasing *environmental performance* is the corporate response to the needs and expectations of the stakeholders. Sustainable development suggested by the connection between *waste* and *material*, and *climate change*, both as a challenge and an opportunity, represents the guiding principle that underpins the corporate behaviour.

### Conclusions

While corporate environmental responsibility has emerged as a concept for business from the developed Western economies and it has recently received increased attention in developing countries, the process is in its early stage within transition economies and, hence, largely under researched. Employing the content analysis of the corporate websites, the study investigates the way high profile companies with direct environmental impact use website corporate communication through non-financial reports to express their environmental policies and practices. In order to achieve this goal, the semantic analysis based on computer-aided techniques (VOSviewer) is looking to gain insights into the main themes related to the environment as addressed by the top polluting companies.

The findings pinpoint to substantial differences of approach regarding the extent and content of environmental disclosure. State-owned enterprises and privatized firms display large scale of



**Fig. 3 – Density of connections between terms**

operations, visibility, economic impact and environmental footprint. Having these characteristics, public and privatized firms would have been expected to disclose more extensively their environmental concerns. The poor environmental reporting reminds their long past of non-accountability as well as the weak motivation to engage in legitimacy building given the socio-economic and political context. Overall, the content analysis of environmental reporting suggests that SOEs fail to engage in environmental sustainability due to their low take-up rates of sustainable business practices. On the contrary, MNEs are aware of the role of corporate communication in enhancing organizational legitimacy, thus their reporting encompasses a wider range of issues related to environmental protection. The reporting is well-structured in three major themes regarding environmental policy, environmental management system and social impact. The companies acknowledge their environmental footprint and show a strong commitment to reduce the negative externalities. Anyway, there is a variation of coherence among the themes displayed by the corporate environmental disclosure with less connectivity and relatedness regarding the environmental management systems.

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The case of a transition economy reveals that the understanding of environmental policy and practice through corporate reporting is inherently different since SOEs/privatized and MNEs display different types of organizational culture which affects not only their productivity and performance, but also the concern for the environment. Therefore, further research is needed to understand the micro - and macro - contextual factors which influence the corporate environmental disclosure.

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