
Assessment of the Scope of Environmental Information Disclosure in External Reporting of Polish Stock Exchange Listed Companies in the Energy Sector

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Abstract:

Purpose: The objective of this paper is to compare the scope of disclosures of environmental information in the annual reports of the largest listed companies of the energy sector in Poland.

Design/Methodology/Approach: The initial part of the article presents regulatory requirements for the scope of disclosure of environmental information in the annual reports of listed companies. Next, the qualitative, quantitative and valuable information contained in the annual reports of the largest energy listed companies in the area of their impact on the natural environment was subject to comparative analysis.

Findings: The results of the empirical research carried out indicate that in the years 2016-2018 all analyzed companies, despite the fact that in their business model refer to the use of GRI standards, the form and place of presenting environmental information in the reports of individual companies is varied. In addition, the scope of content, shape and position of this information in the annual reports of the same companies over the years assessed also indicate significant differences.

Practical Implications: A considerable variety of reporting on the environmental impacts of the energy companies prevents full comparability of data on the impact of their activities on the natural environment and ways to counteract its degradation.

Originality/value: In order to solve the identified problem, Polish energy companies should be obliged to report on the environment according to a unified template, so that the information they prepare is comparable and form the basis for making rational management decisions in the area of environmental impacts.

Keywords: Environmental information, environmental reports, listed companies, energy sector.

JEL classification: C12, M41, M42, Q51, Q56.

Paper Type: Research study.

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1. Introduction

The natural environment has a significant impact on human well-being, providing productive and consumer goods and sustaining the systems on which life on earth depends. Such significant functions of the natural environment make it play an important role in the activities and development of enterprises. They should strive to minimize the direct negative impact on this environment by optimizing social and environmental benefits from the use of modern and pro-ecological technical and technological solutions. Enterprises carrying out these activities will be perceived as socially responsible (Majchrzak, 2013). The aspiration of modern enterprises to obtain the status of a socially responsible enterprise is a guarantee of its value growth in the long term.

The problem of care for the natural environment concerns enterprises from all areas of the economy, in particular those whose activities may cause its significant degradation. This group includes, among others, enterprises from the energy sector. In the case of these enterprises, the environment provides energy resources and at the same time "accepts" the side effects of energy generation, i.e. heat from cooling systems, gaseous substances and dust, as well as solid and liquid waste (Majchrzak, 2011). In particular, during the extraction of primary fuels used in the power industry, mining damage occurs, causing the collapse of areas above the exploited seams, atmospheric air pollution during the process of extraction, processing and enrichment of fossil fuels and during their transport to customers, contamination of groundwater and surface water by solid mine waste due to dusting, and as a result of the leakage of stored or transmitted liquid fuels or salinisation of mine water, which poses a threat to rivers. In addition, the main pollutants caused by the power industry include the emission of gaseous contaminants, mainly sulphur dioxide, nitrogen oxides and dusts, or the emission of heated cooling waters which are industrial wastewater. The effects of their negative impact on the natural environment are mainly borne by agriculture, forestry, water management, industrial production and health of the inhabitants. This requires its protection on a global (worldwide) scale.

In these circumstances, information on the monitoring by energy companies of the level of environmental pollution and the forms and means to protect it is important for all interested parties. This information, in the form of financial or non-financial information, should be provided in the integrated annual reports of those undertakings in the form of a sustainability report or an element of a management report. They are subject to relevant international and national regulations. The non-financial reports, which usually concern external effects, i.e. positive or negative effects of the company's activities on third parties and the environment are of particular importance. Such information can be expressed in qualitative, quantitative and sometimes even monetary terms. However, most often qualitative information is used, which creates an appropriate context for the analysis of financial information and shows the effectiveness of the company's management in the required area,

indicates threats to its reputation, position in the industry or the model of its value creation (Alazzani *et al.*, 2013; Jaworska 2011).

The aim of the article is a comparative assessment of the scope of environmental information disclosure in annual reports of the largest stock exchange listed companies in the energy sector in Poland.

For the purpose of its implementation the following research hypotheses were formulated.

- the largest Polish stock exchange listed companies in the energy industry disclose environmental information in a diverse range, shape and place,
- environmental information presented in the annual reports of energy companies does not allow for full comparability of data on their impact on the environment and ways of preventing its degradation.

In order to verify the research hypotheses, in the theoretical part of the article, the method of critical analysis of literature sources was used, while its research part takes advantage of the method of examining documents and the method of comparative analysis. The choice of the method of examining documents was dictated by the area of research, the type of available annual reports of selected companies and the reliability of information obtained from these sources. On the other hand, the use of the comparative analysis method was to indicate similarities and discrepancies in the scope and manner of presentation of environmental information by these companies. The use of the comparative analysis in this type of empirical research makes it possible to determine the existence or absence of the same qualitative characteristics, distinctiveness in their varieties or their intensity in different phenomena or objects (Stachak, 2006). In the selected research sample, the subject of the research covers qualitative, quantitative and valuable information contained in the annual reports of the largest stock exchange listed energy companies in the area of their environmental impact. This information comes mainly from CSR reports and reports on the activities of the management board of these companies.

2. Regulatory Requirements for Environmental Disclosure in the Annual Reports of Stock Exchange Listed Companies

International pressure on the energy sector to protect the environment involves the development and implementation of standards for the protection of natural resources and environmental impacts, bans and licenses for the use of natural resources, and the introduction and wide dissemination of environmental protection programmes, as well as the development of guidelines for the generation of multidimensional information by companies on their environmental impacts and how to mitigate their negative impacts (Majchrzak, 2013). As already mentioned, it is connected with the view that the scope of information provided by financial reporting to date in a valuable form is insufficient for the enterprise stakeholders interested in corporate

social responsibility in the context of sustainable economic development of countries or whole regions (Camilleri, 2017). Many of the effects of enterprises on society and the environment are not measurable in monetary terms. Therefore, the scope of reporting by enterprises includes quantitative and qualitative information in a narrative form in order to increase the usefulness of these reports for interested parties (Mućko and Hońko, 2013; Monteiro and Aibar-Guzman, 2010; Stjepcevic and Siksnylyte, 2017). The extension of the scope of financial information to social and environmental issues in companies' annual reports should focus on those entities with the greatest negative environmental impact, such as the energy sector companies already mentioned. These reports are referred to as integrated. Effective implementation of integrated reporting in practice requires appropriate legal regulations in this area (Act of 10 April 1997. - Energy Law, Journal of Laws 1997, No. 54, item 348 as amended). So far, many regulations, their drafts, protocol guidelines and initiatives have been developed in the world in terms of presenting the basic scope of information, together with draft indicators determining the degree of negative impact of enterprises' activities on society and the environment and actions taken to eliminate this negative impact (Fiałkowska *et al.*, 2019; Thalassinou and Pociovalisteanou, 2007; Thalassinou and Thalassinou, 2006; Pociovalisteanu *et al.*, 2010). The basic legal regulation concerning sustainable development issues, including environmental protection issues in Europe, is EU Directive 95 of 2014. The Directive is intended to harmonise practices in the field of disclosure of non-financial information in annual reports in relation to Polish companies with an average annual employment of over 500 employees. The Directive indicates that the entities covered by it may adjust their reporting on their social responsibility, which also includes activities for the natural environment presented in the form of various indicators³, to many national, EU and international frameworks in this area. A list of selected global standards for disclosure of environmental information by companies and other institutions is presented in Table 1.

Detailed rules of presenting and disclosing environmental information in annual reports are included in international and Polish accounting regulations. This is, for example, the case with International Accounting Standard (IAS) No. 37 "Provisions, contingent liabilities and contingent assets" or IFRIC Interpretation 5 "Rights to interests arising from participation in decommissioning, restoration and environmental remediation funds". Polish Accounting Act (Journal of laws 2019, item 351) points out that large companies should present in their activity reports a statement on key non-financial performance indicators related to their activities and information on employee and environmental issues. It will not be required to present this information in the report on operations if it prepares, together with the report on operations, a separate report on non-financial information and posts it on its website within 6 months of the balance sheet date. In this situation, the company shall

³*The environmental indicator measures the environmental impact of the enterprise's activities.*

include in its report on operations a separate report on non-financial information. The manner of presenting this information is described in NAS No. 9 "Report on operations" (Official Journal of the Minister of Development and Finance, 2017, No 12, item 4).

Table 1. Selected standards and management systems taking into account the presentation of environmental information by companies and other institutions

No.	Act	Scope of environmental information to be disclosed
1.	EU Directive (2014/95/EU)	1) the current or anticipated environmental impact of the activity (also on health and safety, where applicable), 2) use of renewable and non-renewable energy sources, greenhouse gas emissions, water consumption and air pollution.
2.	Eco-management and audit scheme (EMAS)	The EMAS scheme is an environmental management system that aims to select those entities that go beyond minimum compliance with regulations on environmental performance. Companies wishing to register under EMAS are required to implement the ISO 14001 standard and publish an environmental statement verified by independent auditors.
3.	Global Initiative Reporting (GRI) 300 Sustainability Reporting Standards	Guidelines for non-financial reporting on the economic, environmental and social impacts of an enterprise. They contain, among other things, a set of universal indicators, including, for example, a proposal for 34 environmental measures.
4.	UN Global Compact initiative	The largest initiative for a sustainable corporate policy aimed at linking business operations to human rights, anti-corruption or environmental protection principles.
5.	Carbon Disclosure Project	Global reporting of greenhouse gas emissions and climate change management. Indicator project with scoring analysis of more than 5000 companies worldwide.
6.	Key performance indicators of the European Federation of Associations of Financial Analysts	Guidelines and key performance indicators for social and environmental reporting.
7.	International Organisation for Standardisation (ISO) standard 26 000	Guide to CSR containing descriptions of various aspects of corporate social responsibility with a list of desired areas of action, including environmental protection.
8.	Protocol to the Energy Charter on energy efficiency and related environmental aspects. Journal of Law EU.L.1994.380.91)	1) assessment of the impact of actions taken on the energy, environmental and economic situation, 2) the effective functioning of market

		mechanisms, including market-oriented pricing and better reflecting the environmental costs and benefits of these disclosures, 3) promoting the use of the most energy-efficient, economically feasible and environmentally friendly technologies, 4) evaluation of the economic instruments put in place to improve energy efficiency and achieve environmental objectives.
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Source: Study based on Fialkowska et al., 2019; Protocol to the Energy Charter on energy efficiency and related aspects of environmental protection (Journal of Laws of EU.L.1994.380.91).

In addition to the accounting rules on environmental disclosure, energy companies must also comply with all kinds of industry regulations in this area. In the case of energy companies, this is the "Energy Law" and related regulations. According to Article 51.1 of the same Act, the design, production, import, construction and operation of equipment, installations and networks should ensure rational and economical use of fuels or energy while maintaining: safety of operation and environment after meeting environmental protection requirements. Art. 45 section 1.3 in turn indicates that the costs of operation of energy companies dealing with electricity transmission and distribution include the costs which result from the expenditure incurred on investment projects undertaken by energy companies dealing with electricity generation to improve environmental protection and the efficiency of electricity generation. Moreover, the articles of the Act indicate that the provision of energy production and services cannot prevent energy companies from fulfilling their obligations to protect the interests of consumers and the environment. The provisions of the Act also require the minister in charge of energy to determine, by way of regulations, the detailed conditions for the operation of the power system together with the requirements for environmental protection. An example of such regulation may be the Ordinance of the Minister of Energy of 12 July 2019 on the annual report on greenhouse gas emissions in the life cycle of fuels and electricity (Journal of laws 2019, item1551). Any impact of undertakings, including energy undertakings on the environment must take into account the principles required by the Law of 27 April 2001 - Environmental law (Journal of laws 2019, item1396). This Act sets out the requirements of environmental protection and the conditions for using its resources, taking into account the requirements of sustainable development, and in particular the issue of setting the conditions for the protection of environmental resources and the introduction of substances or energy into the environment, as well as the costs of using it.

The standards, guidelines and legal regulations presented above indicate that from a legislative point of view, the issues concerning the scope of disclosures and ways of presenting information on the impact of enterprises on the environment and counteracting the negative effects of this impact are largely regulated. It may be a

problem to respect these norms in economic practice. In order to verify the scope of compliance of enterprises with the required environmental information disclosures, a survey was conducted among Polish stock exchange companies from the energy sector.

3. Description of the Test Sample

To assess the scope of environmental disclosures in external reporting, energy sector companies listed on the stock exchange (WSE) were selected. In 2018, 12 companies from the energy sector (renewable energy) were listed on the WSE main market. However, these entities differ in the profile and scope of services provided. These are companies that deal with energy activities in a variety of areas, starting from the acquisition of raw materials necessary to produce energy, then its production in various sources, transmission, distribution and trade in energy and certificates of origin. The surveyed entities also include those that specialize in designing and implementing integrated systems based on photovoltaic cell technologies. The profile of activity of stock exchange companies in the energy sector is presented in Table 2.

The selection of companies in this sector to assess the scope of environmental information disclosure in annual reports was supported by their significant degree of environmental impact, already indicated in the introduction of this study. Although over the years a dynamic growth of pro-environmental activities undertaken by this sector can be observed, it cannot be relieved of responsibility for the current state of the natural environment. The energy sector continues to contribute to:

- 1) atmospheric air pollution,
- 2) degradation of land, surface water and groundwater,
- 3) waste collection,
- 4) deterioration of the health of the local community,
- 5) loss of aesthetic value of the land.

International pressure on the energy sector to protect the environment consists, inter alia, in the development and implementation of standards for the protection of natural resources and environmental impacts, bans and licences on the use of natural resources and the introduction and wide dissemination of environmental protection programmes (see Table 1). One solution is to include relevant environmental information in external reporting of companies. Although there are no unified standards for the presentation of this type of information, Article 49 of the Accounting Act imposes an obligation on large entities of public interest to disclose material information concerning, inter alia, environmental issues. The entities covered by these requirements include companies in which:

- the average annual FTE exceeds 500 persons and

- total assets of the balance sheet at the end of the financial year are higher than PLN 85 million or net revenues from sales of goods and products for the financial year are higher than PLN 170 million.

The characteristics of the surveyed entities taking into account the criteria of the Accounting Act are presented in Table 3.

Table 3 does not include three companies in the energy sector listed on the stock exchange due to their scope of activities conducted mostly outside Poland (see Table 4).

The characteristics of the research sample presented in Table 2 show that the largest range of services are offered by TAURON Polska Energia SA (TPE), Polska Grupa Energetyczna SA (PGE), Polenergia S.A. (PEP), Energa SA (ENG), ENEA SA (ENA) and Cez S.A. (CEZ). Taking into account the information contained in Tables 3 and 4, Polenergia S.A. was eliminated from the detailed analysis of environmental disclosure, as under the Accounting Act it is not obliged to disclose environmental information in annual reports. As mentioned earlier, this is determined by the average annual number of employees in the company, which in 2018 did not exceed 500 people. The decision to resign from the analysis of the scope of environmental information disclosure in the case of CEZ was made by such factors as: ownership of capital and the place of providing services, which are mostly performed abroad. Thus, the assessment of the scope of environmental disclosure in external reporting was carried out in four key Polish energy sector companies, which participate in almost the entire process of energy value creation, and at the same time are obliged by the Accounting Act to disclose this type of information to interested parties. The analysis of external reports of the surveyed companies was carried out bidirectionally in 2016-2018 in order to determine the degree of comparability over time of the information disclosed in the companies in question in terms of place, structure and content of the disclosures and between them over the period under review. The source of data for the analysis was information contained in integrated reports, social reports (CSR) prepared by the surveyed entities and presented on their websites.

Table 2. Profile of activity of the surveyed entities

Specification	ZEP (ZEPAK)	TPE (TAURONTP)	PGE	PEP	MLS (MLSYSTEM)	KGN (KOGEEERACJA)	IRL (INTERAOLT)	EST (ESTAR)	ENG (ENERGA)	ENA (ENEA)	CEZ	BDZ (BEDZIN)
Extraction		X	X							X	X	
Production	X	X	X	X		X			X	X	X	X
Distribution		X	X	X			X	X	X	X	X	
Turnover				X					X	X	X	
Sale		X	X	X							X	
Other activities					X ¹						X ²	

¹ design and implementation of integrated systems based on photovoltaic (PV) technologies, including those integrated with buildings (BIPV), for solar power generation.

² construction engineering, maintenance and extension of power plants and distribution networks, as well as information technology, telecommunications and scientific research in selected branches.

Source: <https://www.bankier.pl/gielda/notowania/akcje/> [access 19.02.2020].

Table 3. Characteristics of the surveyed entities taking into account the criteria for mandatory presentation of environmental information according to the Accounting Act for 2018

Specification	ZEP (ZEPAK)	TPE (TAURONTP)	PGE	PEP	MLS (MLSYSTEM)	KGN (KOGEEERACJA)	ENG (ENERGA)	ENA (ENEA)	BDZ (BEDZIN)
Value of net revenues from sales of goods and services [in thousands PLN]	681.414	4.819.946	6.984.000	887.950	36.858	301.593	2.736.000	3.288.572	64.942
Total assets [in thousands PLN]	3.871.297	37.097.477	75.905.000	3.054.282	179.346	2.385.277	21.599.000	29.965.625	662.587
Employment [in persons] company	940	456	628	56	-	356	170	382	4
Employment [in persons] group	5.209	25.622	41.763	195	131	489	9.456	16.185	165

Source: <https://www.bankier.pl/gielda/notowania/akcje/> [access 19.02.2020].

Table 4. Characteristics of foreign energy sector entities listed on the stock exchange for 2018

Specification	IRL (INTERAOLT)	EST (ESTAR)	CEZ
Net revenue from sales of goods and services	92.433 thousand of euros	-	51.492.000 thousand of CZK
Sum of assets	74.078 thousand of euros ¹	1.759.317 thousand of HUF	707.443.000 thousand of CZK ⁴
Employment [in persons] company	24	6 ³	5.525 ⁵
Employment [in persons] group	12 ²	16	31.385

¹ data refers to the first quarter of 2019

² data refers to 2017

³ data refers to 2015

⁴ attributable to a shareholder of the parent company

⁵ data refers to 2014

Source: <https://www.bankier.pl/gielda/notowania/akcje/> [access 19.02.2020].

4. Review of the Scope of Disclosures in the Surveyed Companies

The analysis of source material of the surveyed companies showed that information on environmental impacts is disclosed in the case of two companies, i.e. TAURON Polska Energia SA and Polska Grupa Energetyczna SA, in the integrated report. The remaining companies publish this information annually in CSR reports, which are separate parts of the report on operations.

Presented environmental information is shown in the reports in question in their separate parts directly related to the company's environmental impact. Analysis of the layout of the content of individual elements of these reports published by the surveyed companies shows significant discrepancies between them. These differences are observed not only in the disclosures of environmental information in reports between individual companies, but also within individual companies analyzing this information over the period under examination, i.e. 2016-2018. The characteristics of environmental information disclosed in annual reports in 2016-2018 by Polish stock exchange listed energy sector companies are presented in Table 5.

The analysis of the scope and content of environmental information contained in the reports of the surveyed companies over the analysed years has shown that they use a different naming for the titles of individual parts of these reports and a very diverse thematic scope. From the reports of four surveyed companies only in two cases identical names were found for separate groups of environmental information. They concerned investments in environmental protection (PGE and ENG) and innovations (PGE and ENA). The remaining parts of the reports related to environmental issues had different names. Therefore, it could not be unequivocally stated that the information presented by enterprises within the framework of particular parts of the reports differed in its scope. Consequently, the study was extended towards a more detailed analysis of the content within particular groups of environmental information contained in these reports. However, it required separate presentation for each company in separate tables (Tables 6-9) of detailed contents of environmental information over the analysed years.

Table 5. Key environmental information included in the annual reports of Polish stock exchange listed companies in the energy sector in 2016-2018

No.	Specification	TPE (TAURONTP)			PGE			ENG (ENERGA)			ENA (ENEA)		
		2016	2017	2018	2016	2017	2018	2016	2017	2018	2016	2017	2018
1.	For the sake of the environment	X	X	X									
2.	Environmental assumptions		X										
3.	Key figures on capital			X									
4.	Natural capital management			X									
5.	Tauron Group Sustainable Development Policy 2017-2025			X									
6.	The Group's role in ensuring reliability and quality of energy supply			X									
7.	Environmental policy				X	X							
8.	Reducing negative environmental impact				X								
9.	CO ₂ emission				X								
10.	Clean air, clean neighborhood					X							
11.	Greenhouse gas emissions					X							
12.	Protection of biodiversity					X	X						
13.	Promotion of responsible approach among customers					X							
14.	Penalties related to environmental impact					X							
15.	Policies on environmental issues						X						
16.	Investment in environmental protection						X	X	X	X			
17.	Cogeneration						X						
18.	Innovations						X					X	
19.	Risks identified and management measures in the area of environmental issues						X						
20.	Selected indicators in environmental issues in the PGE Capital Group						X						
21.	Selected indicators in environmental issues in PGE S.A.						X						
22.	Environmental objectives for the current year							X	X	X			
23.	Environmental management strategy							X	X				
24.	Green energy from conventional and renewable sources							X	X				
25.	Innovative environmentally friendly technologies							X					
26.	Current environmental footprint of conventional and renewable energy sources									X			
27.	Investment for sustainable development									X			
28.	Our influence and actions										X		
29.	Energy										X		
30.	Emissions										X	X	X
31.	Water and raw materials										X	X	

32.	Renewable energy sources (RES)											X	X	X
33.	Environmental impact management												X	
34.	Investment and modernisation												X	
35.	Energy efficiency												X	
36.	Innovations												X	
37.	Approach to sustainable development													X
38.	Investment and innovation													X
39.	Materials and raw materials													X
40.	Water													X

Source: <http://raport2016.tauron.pl/>; <http://raport2017.tauron.pl/>; <https://raport.tauron.pl/> [access 19.01.2020]; <https://raportzintegrowany2016.gkpge.pl/>; <https://raportzintegrowany2017.gkpge.pl/pl.html>; <https://raportzintegrowany2018.gkpge.pl/> [access 29.01.2020]; https://grupa.energa.pl/upload/wysiwyg/CSR/2017/Raport_CSR_energa_2016_25_04_PL_ROZ.pdf; file:///C:/Users/HPI/AppData/Local/Temp/grupa_energa_raport_csr_nasza_odpowiedzialnosc_2017-1.pdf; file:///C:/Users/HPI/AppData/Local/Temp/grupa_energa_raport_csr_nasza_odpowiedzialnosc_2018.pdf [access 07.01.2020]; <http://raportcsr.enea.pl/2016/pl>; <https://raportcsr2017.enea.pl/pl/enviroment/impact>; <https://raport2018.csr.enea.pl/> [access 16.01.2020].

Table 6. *Scope of environmental information disclosures in TAURON Polska Energia SA annual reports in 2016-2018*

No.	Components of the report and scope of information contained	2016	2017	2018
I.	For the sake of the environment			
1.	Raw materials and consumables used by weight and volume for the current and previous year	X		
2.	Total water intake by source in current and previous year	X		
3.	Total volume of wastewater by quality and destination in the current and previous year	X		
4.	Total weight of hazardous waste by type of waste and waste treatment method in the current and previous year	X		
5.	Total weight of non-hazardous waste by type of waste and waste treatment method in the current and previous year	X		
6.	Investments in environmental projects, including total environmental protection expenditure by type	X		
7.	Direct emissions of greenhouse gases in the current and previous year	X	X	X
8.	Emissions to air of NO _x , SO _x and other compounds in the current and previous year	X	X	X
9.	Reduction of CO ₂ emissions	X		
10.	Financial implications and other risks and opportunities for action by the organisation arising from climate change	X		
11.	Environmental education in the field of environmental protection, including a description of the projects Open Days of ZW Katowice, Tauron Ecoenergy Nature Hall, Action do not be a passive smoker	X	X	X
12.	Responsible management of resources forming natural capital		X	
13.	Energy intensity in current and previous year		X	
14.	Good practice for process waste		X	X
15.	Minimising negative environmental impacts			X
II.	Environmental assumptions			
1.	Description of environmental assumptions		X	
III.	Key data on capital			
1.	Non-renewable resources			X
2.	Raw materials used over the period 2015-2018			X
IV.	Natural capital management			
1.	Results achieved in reducing emissions of carbon dioxide, nitrogen oxide, sulphur dioxide, dust and others and waste over the period 2015-2018			X
V.	Tauron Group Sustainable Development Policy 2017-2025			
1.	Description of the policy adopted			X
VI.	The Group's role in ensuring reliability and quality of energy supply			
1.	Installed capacity by type of fuel used in 2016-2018			X
2.	Installed capacity by type of generation units in 2016-2018			X
3.	Net energy produced per energy source and national regulator requirements 2016-2018			X

4.	Raw materials used by weight and volume in 2016-2018			X
5.	Total energy consumption from renewable sources in 2016-2018			X
6.	Total energy consumption (purchased and own) by type in 2016-2018			X
7.	Energy sales by type in 2016-2018			X
8.	Energy intensity			X
9.	Length of overground and underground transmission and distribution lines according to the regulatory system			X
10.	Investments to ensure reliable energy supply and promote sustainable development			X
11.	Average duration of power cuts in 2016-2018			X
12.	Frequency of power cuts between 2016 and 2018			X
13.	Transmission and distribution losses			X

Source: <http://raport2016.tauron.pl/>; <http://raport2017.tauron.pl/>; <https://raport.tauron.pl/> [access 19.01.2020].

TAURON Polska Energia SA discloses environmental information in various parts (tabs) of the integrated report. Thus, it should be expected that the information presented in this report will be of high quality and comparability over time. However, the scope of environmental disclosures over the years 2016-2018 differed significantly from the information disclosed in other companies' reports in this respect (see Table 6). The most extensive information was disclosed in the report prepared for 2018, while the smallest scope was presented in the report for 2017. In each of the examined documents, information on direct emissions of greenhouse gases, emissions to the air of NO_x, SO_x and other compounds and educational activities undertaken in the field of environmental protection were disclosed. In two of the analysed periods, information on good practices in the field of process waste was provided. This information was presented in the same parts of the report each year. Such a great diversity of the form and scope of presented information in particular years makes it impossible for the interested parties to compare the degree of the company's environmental impact over the years. Thus, it is of little use to the recipients in the process of making decisions and shaping opinions on the pro-ecological activity of the examined company.

Polska Grupa Energetyczna SA was another company whose external reports on environmental impacts were analysed. It is the second of the surveyed entities which presents environmental information since 2015 in an integrated report, i.e. a report of the highest quality and usefulness. Undoubtedly, during the analysed period, the scope of environmental disclosures on the company's impact on the natural environment expanded considerably. However, as in the case of TPE, a significant diversity of the presented information can be seen in the analysed period (see Table 7). Each year there are changes in the place of disclosures in individual reports. This applies, for example, to information on the amount of waste generated and the methods of its management. In 2016, this information was disclosed in the "Reduction of negative environmental impact" section, in 2017 in the information

group under the title "Environmental Policy", and in 2018, in turn, this information was disclosed in the section under the title "Selected indicators in the area of environmental issues in the PGE Capital Group".

Table 7. *Scope of disclosures of environmental information contained in annual reports of Polska Grupa Energetyczna SA in 2016-2018*

No.	Components of the report and scope of information contained	2016	2017	2018
I.	Environmental policy			
1.	Declaration on environmental policy	X		
2.	Environmental management	X		
3.	Environmental policy objectives		X	
4.	Environment and ethics		X	
5.	Management of waste and by-products		X	
6.	Reclamation of adversely transformed land		X	
7.	Prevention of noise emissions		X	
II.	Reducing negative environmental impact			
1.	Air protection, including emissions of CO ₂ , NO _x and dust and the estimated environmental effects of new investments	X		
2.	Waste and by-product management, including total weight of waste by type of waste and waste handling method	X		
3.	Water and wastewater management, including the total volume of wastewater by destination quality	X	X	
4.	Prevention of noise and electromagnetic field emissions	X		
5.	Reclamation of negatively transformed land	X		
6.	Protection of biodiversity	X		
7.	Green office, including the monetary value of penalties and the total number of non-financial sanctions for non-compliance with environmental laws and regulations	X		
III.	Our emission of CO ₂			
1.	RES installed capacities	X		
2.	Efficiency of production	X		
3.	Use of local resources	X		
4.	Energy storage	X		
IV.	Clean air, clean neighborhood			
1.	Investment in reducing emissions		X	
2.	Emissions of NO _x , SO ₂ and dusts into the atmosphere		X	
3.	Emissions of NO _x , SO ₂ and dusts and acceptable standards		X	
4.	Estimated environmental effects of new investment projects compared to the existing ones		X	
V.	Greenhouse gas emissions			
1.	Net average emissions of PGE Group		X	
2.	Development actions to further reduce PGE's emission levels		X	
3.	Installed capacities		X	
4.	Structure of the fuel used		X	

5.	Fuel efficiency		X	
6.	Efficiency measures to reduce emissions of CO ₂		X	
7.	Energy storage		X	
V.	Protection of biodiversity			
1.	Description of investment measures taken to protect biodiversity		X	
2.	Reclamation			X
3.	Green transformers			X
4.	Bird protection			X
5.	Fish protection			X
6.	Selective collections of SRMs			X
VI.	Promotion of responsible approach among customers			
1.	Anti-smog offer		X	
2.	Save light for small businesses		X	
VII.	Penalties related to environmental impact			
1.	The value of fines and the number of non-financial sanctions for non-compliance with environmental laws and regulations in companies with the greatest impact on the environment		X	
VIII.	Policies on environmental issues			
1.	System of environment management			X
2.	EMAS			X
IX.	Investment in environmental protection			
1.	Research and development			X
2.	Modern blocks			X
3.	Thermal waste treatment installations with energy recovery			X
4.	Closed circuit			X
5.	PGE Green Offices			X
X.	Cogeneration			
1.	PGE Group heating strategy			X
2.	Anti-smog tariff			X
XI.	Innovations			
1.	PGE accelerator			X
2.	Improving air quality			X
3.	Energy Clusters			X
4.	Electromobility			X
5.	Natural energy sources			X
XII.	Risks identified and management measures in the area of environmental issues			
1.	Environmental risk			X
2.	Risk of concessions			X
XIII.	Selected indicators in the area of environmental issues in the PGE Capital Group			
1.	CO ₂ emissions from the Group's main installations, indicating the allocation of powers			X
2.	Emissions of NO _x , SO ₂ and other compounds emitted into the air			X
3.	Total water intake for production purposes by source			X

4.	Total volume of wastewater by quality and destination			X
5.	Total weight of waste by type of waste and waste treatment method			X
6.	The value of fines and the number of non-financial sanctions for non-compliance with environmental laws and regulations in companies with the greatest impact on the environment			X
XIV.	Selected indicators in the area of environmental issues in PGE S.A.			
1.	Annual electricity consumption in the seat of PGE S.A.			X
2.	Annual consumption of heat energy in the seat of PGE S.A.			X
3.	Annual consumption of sheets of paper in the seat of PGE S.A.			X
4.	Annual water consumption and sewage disposal in the seat of PGE S.A.			X
5.	Annual consumption of toner cartridges in the seat of PGE S.A.			X
6.	Energy-saving LED luminaires in the seat of PGE S.A.			X

Source: <https://raportzintegrowany2016.gkpge.pl/>;
<https://raportzintegrowany2017.gkpge.pl/pl.html>; <https://raportzintegrowany2018.gkpge.pl/>
[access 29.01.2020].

The presentation by the surveyed company of information on the monetary value of penalties and non-financial sanctions for non-compliance with environmental laws and regulations is particularly noteworthy. Such information is most often omitted in external reports due to a selective approach to the presented content, i.e. presentation of positive information above all. Nevertheless, as in the case of information on waste, it is presented in various parts of the report. In 2016 it was "Reduction of negative impact on the natural environment, in 2017 in a specially separated part of the report "Penalties related to environmental impact" and in 2018 in "Selected indicators in the area of environmental issues of the PGE CG".

Such an approach makes it significantly more difficult for customers to make direct comparisons between the environmental indicators obtained by the company and the actions taken to protect and restore the natural environment. The justification for the method of disclosing the information in question is to strive to develop a report structure adapted to the standards specified in GRI G4 guidelines.

The analysis of the scope of disclosure of environmental information by Energa SA in 2016-2018 shows the greatest coherence (see Table 8). Out of five parts of the reports, as many as three were separated in each of the analysed periods, and the remaining two in two analysed years. Moreover, during the analysed years, the scope of information contained in particular parts of the report did not change, which allowed for its comparability. The lack of disclosures of environmental information in a given year in a specific part of the report resulted from the fact that a given event did not occur in that period. The stability in the scope, forms and place of

presentation of environmental information contained in subsequent annual reports of the analyzed company increases the usefulness of this information for interested parties. They constitute a valuable source of data for comparisons in time of the environmental indicators achieved, and thus for making management decisions in this area.

Table 8. *Scope of environmental information disclosure contained in Energa SA annual reports in 2016-2018*

No.	Components of the report and scope of information contained	2016	2017	2018
I.	Environmental objectives for the current year			
1.	Objectives for the current year and their implementation with an indication of priorities for the following year	X	X	X
II.	Environmental management strategy			
1.	Description of the implementation of the EMAS management system in companies	X	X	
2.	Description of the approach to environmental management			X
3.	Environmental and energy management system			X
4.	Energy efficiency, including energy consumption in the organisation	X	X	X
5.	Consumption of raw materials/non-renewable and renewable materials by weight and volume	X	X	X
6.	Emissions to air of greenhouse gases, pollutants to air, including NO _x and SO _x	X	X	X
7.	CO ₂ emission allowances	X	X	X
8.	Water resources, including water collection by source, wastewater volume by quality and destination	X	X	X
	Waste management, including weight of waste by type of waste and waste treatment methods	X	X	
9.	Nature protection of valuable natural areas	X	X	
10.	Impact on environmentally valuable areas			X
11.	Development of the "Energy for Nature" programme with the indication of expenditure on stork protection activities in 2013-2015	X	X	X
12.	Nature Fund	X		
III.	Green energy from conventional and renewable sources			
1.	Description of energy generation methods, indicating the maximum capacity and the amount of energy produced, broken down by main types of raw material	X	X	
IV.	Investment in environmental protection			
1.	Description of the implemented investment programmes with the indication of total investment expenditure on environmental protection	X	X	
	Description of planned environmental projects			X
V.	Innovative environmentally friendly technologies			
1.	Description of the projects with the indication of expenditure on innovation and R&D activities	X		
2.	Description of planned and implemented research and			X

	development projects with indication of good practices			
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Source: https://grupa.energia.pl/upload/wysiwyg/CSR/2017/Raport_CSR_energia_2016_25_04_PL_ROZ.pdf;

file:///C:/Users/HP1/AppData/Local/Temp/grupa_energia_raport_csr_nasza_odpowiedzialnosc_2017-1.pdf;

file:///C:/Users/HP1/AppData/Local/Temp/grupa_energia_raport_csr_nasza_odpowiedzialnosc_2018.pdf [access 07.01.2020].

The last group of environmental reports analysed were those published by Enea SA (see Table 9). In the case of this entity, after an initial increase in the scope of disclosures on environmental impacts in 2018, a significant reduction was observed. Moreover, as in the case of TPE and PGE, a diversity in the approach to the place of presentation of specific information can be seen. For example, total electricity consumption in 2016 was shown in a separate part of the "Energy" report. In 2017 it was already another part called "Energy Efficiency", and in 2018 energy consumption was shown in the part entitled "Materials and Raw Materials". The freedom of such an approach also applied to other issues, i.e. the main raw materials used by the entity, water intake, waste generated, or investments carried out. The greatest changes in the structure of the content of the published report are observed in 2018, which, as previously emphasised, may be an attempt to systematise the presented disclosures for the purposes of legal regulations on the disclosure of non-financial information. Nevertheless, the way the information is presented over the period under review is of little use to recipients wishing to make direct comparisons of the entity's environmental impacts over the years.

Table 9. *Scope of environmental information disclosures by ENEA SA in 2016-2018*

No.	Components of the report and scope of information contained	2016	2017	2018
I.	Our influence and actions			
1.	Environmental protection management	X		
2.	Description of key investments by area of production and distribution with indication of total financial outlays for emission reduction of SO _x , NO _x and dust into the air in 2009-2016 at Koziencice Power Plant	X		
II.	Energy			
1.	Total electricity consumption in the current year	X		
III.	Emissions			
1.	Tighter emission standards	X		
2.	Carbon dioxide emissions by companies in the generation segment in the current year	X		X
3.	Level of sulphur oxides, nitrogen oxides and dust emissions in the current year	X		X
4.	Concentration of pollutants in Koziencice Power Plant in the current year	X	X	
5.	What have we done to reduce our emissions this year?	X		
6.	Compliance with guidelines/regulations		X	X

7.	Compliance with formal and legal requirements indicating the level of emissions of carbon dioxide, sulphur oxides, nitrogen oxides and dust in individual energy sources and the degree of utilisation of annual emission ceilings		X	
8.	Concentration of pollutants in Połaniec Power Plant		X	
IV.	Water and raw materials			
1.	Main raw materials used by Enea Manufacture for the current and previous year	X	X	
2.	Total water intake of Enea Group companies in the current year with indication of source	X	X	
3.	Waste by type of waste (hazardous and other) in the current year	X	X	
V.	Renewable energy sources (RES)			
1.	Enea Group's electricity generation (net) from renewable energy sources	X	X	
2.	Enea's investment in renewable energy sources to date and planned	X	X	
3.	Key investments in the area of RES in the current year	X		
4.	Energy production from RES in Enea Capital Group			X
VI.	Environmental impact management			
1.	Environmental protection in strategy and management		X	
2.	Due diligence policies and procedures		X	
VII.	Investment and modernisation			
1.	Description of investments and modernisation in the area of production and distribution		X	
2.	Description of investments made in the new unit at Koźienice Power Plant		X	
IV.	Energy efficiency			
1.	Total electricity consumption in the current year		X	
2.	Actions launched in the current year to reduce energy consumption		X	
3.	Minimising energy losses in distribution processes		X	
4.	White certificates		X	
V.	Innovations			
1.	Electromobility		X	
2.	Energy storage		X	
3.	Energy Cluster		X	
VI.	Approach to sustainable development			
1.	Ethics in environmental protection			X
2.	Compliance in the environmental aspect			X
3.	Due diligence, including strategic development directions and processes related to environmental protection in terms of generation in particular energy sources			X
VII.	Investment and innovation			
1.	Investments reducing environmental impact, including measures to reduce emissions, investments in RES,			X

	investments in Customer Service Offices			
2.	Pro-environmental actions, including involvement in the "Green Face of Kozenice Power Plant" project			X
VIII.	Materials and raw materials			
	Main raw materials used by EneE Wytwarzanie for the current and previous year			X
	Waste by type of waste (hazardous and other) in the current year			X
	Total electricity consumption in the current year			X
IX.	Water			
	Total water intake of Enea Group companies in the current year with indication of source			X

Source: <http://raportcsr.enea.pl/2016/pl/>; <https://raportcsr2017.enea.pl/pl/environment/impact/>; <https://raport2018.csr.enea.pl/> [access 16.01.2020].

Comparing the scope of information disclosed by the energy companies surveyed, it can be concluded that all entities present general information on their environmental policy, atmospheric emissions, water intake, sewage disposal and investment activities. However, this information has a different scope and place of presentation, which makes it very difficult to compare it in time and space in order to assess the impact on the environment and actions taken to reduce the negative impact and restitution of the environment.

5. Conclusions

The specificity of the process of generation, transmission and distribution of energy from various sources results in a strong environmental impact of energy companies. This sector is considered to be one of the main perpetrators of environmental pollution and loss of natural resources. Therefore, these companies should present information with due diligence and accuracy about the negative impact on the environment and about actions taken to limit the negative effects of their activities and to restore the damaged environment.

As it has been shown in the article, power companies may disclose environmental information in a separately prepared report on activities or as part of the integrated report, or in separate environmental reports. The analysis of four key Polish stock exchange listed companies in the energy sector has shown that each company, despite a similar approach, has chosen a different solution. Among the surveyed companies, two published such information in an integrated report and two in CSR reports.

A comparative analysis of the scope of disclosures and presentation of environmental information in external reports of the surveyed energy companies in 2016-2018 showed that:

- although all analysed companies in their business model refer to the use of GRI standards, which should foster uniformity of data presentation, the content of their disclosures is different,
- the form and places of presentation of information in the reports of individual companies vary,
- the scope of content, shape, form and position of information in annual reports within the same companies over the evaluated years also show significant differences.

The significant diversity of reporting of environmental impacts of the energy sector makes it impossible to fully compare data on the impact of the activity conducted by the surveyed entity on the natural environment and the ways of preventing its degradation. Thus, the hypotheses set out in the introduction to the article have been verified and the objective has been achieved.

A solution to the identified problem could be to oblige Polish energy companies to report on the environment according to a unified template, so that the information prepared by them would be comparable and would constitute a basis for making rational management decisions in the area of environmental impacts. Moreover, uniformly disclosed environmental information should be comparable with the level of the desired environmental condition set by relevant organisations. Such comparison would allow to determine the trend of environmental impacts.

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