



## Article

# Environmental Corporate Social Responsibility Activities in Heating Industry—Case Study

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**Abstract:** The paper focuses on problems connected with Environmental Corporate Social responsibility in the energy industry. The objective behind this article is to analyse pro-environment activities within Environmental Corporate Social Responsibility (ECSR) that heating operators carry out, using the example of a Poland-based company called Miejska Energetyka Ciepła Spółka z o.o. with headquarters in Koszalin. In particular, this study focuses on pro-environment activities that the company has been involved in from 2017–2020. The data and information found in this study demonstrate that the company systematically devoted its financial resources to pro-environment efforts in terms of both ISO 14001 maintenance as well as educational/promotional activities. According to the findings, the company has been highly committed to Environmental Corporate social Responsibility issues. The implementation of its strategy in this field can lead to ecological innovation and help establish an effective business model that will be founded on ecological assumptions.

**Keywords:** CSR; ECSR; corporate social responsibility; environmental corporate social responsibility; heating plant; heating industry



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## 1. Introduction

Corporate Social Responsibility aspects are crucial in today's business world. Energy sector operators engage in CSR activity to foster a positive image on the market and achieve a certain vision of a socially responsible organisation [1,2]. Nowadays, many scholars have emphasised the use of many corporate social responsibility practices in organisations. On this basis they estimated that the topics connected with Corporate Social Responsibility are very useful research area for scholars, businesses, practitioners and managers [3]. The term of CSR itself is use differently in various context and it is not easy to conceptualize properly [4]. Many authors have tried to measure the corporate social responsibility activities using various indicators [5–11]. The concept of measuring corporate social responsibility of the organisation indicates how particular organisation connect with suppliers, clients, retailers and also other stakeholders. The analysis can show how particular business activities emphasize the habitat and can identify the incorporation into the business social concerns can add value to the organisation and stakeholders [12,13].

We can divide CSR practices into external, internal and environmental responsibilities [3,14]. The interior obligations are related to employees' safety, health and an improvement of their quality of life. External responsibilities are connected with business aid offered to social and cultural activities in local communities. It also includes problem related to local communities and society development. The third type of CSR practice is environmental responsibility. This type of corporate social responsibility contains business processes and practices connected with waste reduction, recycling, monitoring, efficiency energy and water usage and efforts to preserve natural resources by the company [15–18]. In our paper we concentrate on this third type of corporate social responsibility.

When a business concentrates on environmental aspects of CSR it is called ECSR (Environmental Corporate Social Responsibility) activity. Firms and especially energy firms have long been regarded as having a potential negative impact on the environment [19]. This is because of the damage caused by excessive industrial production to the ecological environment [20]. To deal with this problem, many firms are now undertaking proactive approach to environmental social responsibility conception implementation. In this case organisation adopt voluntarily business practices that go beyond regulatory requirements to support environmental sustainability [21].

Some studies divide ECSR in proactive ECSR, which is voluntary ECSR, and passive ECSR, which is obligatory ECSR [22,23]. The active ECSR is connected with business practices adopted voluntarily by organisation that go beyond typical regulatory requirements because organisation wants to support environmental sustainability. The passive ECSR is the practice of the adoption of ECSR rules by company to achieve compliance with environmental regulatory standards imposed by government with minimum effort. In our study we analysed proactive ECSR.

The ECSR is very important especially in the energy industry because its large negative environmental impact [24,25]. The impact of the sector is mainly due to CO<sub>2</sub> emission connected with energy production especially in the case of coal energy. In European Union countries, the energy sector is moving towards a cleaner sector and governments impute restrictions on them to decrease CO<sub>2</sub> emission, but for now it is still not an eco-friendly sector [26]. Because of that we think that involvement in pro-environment actions becomes particularly important in that sector.

When analysing specialist literature dedicated to ECSR, we can find a number of publications on ECSR tools, their application and implementation of ECSR actions in various sectors; however, a query through the most reliable databases available, such as Web of Science and Scopus, shows that few publications focus on the analysis of pro-environment activity within ECSR of energy sector operators. Studies concentrate on other sectors and there is a research gap connecting to analysis of corporate social responsibility practices in energy sector. It is a gap worth investigating because the ECSR activities adopted in today's business and energy companies have a big environmental impact. To decrease the negative impact of energy companies on the natural environment, organisations need to implement ECSR tools and practices. The analysis of case studies about the topic can be valuable from a scientific point of view but also can bring valuable data and set of best practices for international companies to use them in their business activities.

Using the international databases finding tools we have not managed to find a single publication that would discuss ECSR or ECS issues in the heating industry in particular. There is a view prevailing in the specialist literature that ECSR is covered by research on relatively rare occasions and there is a rather limited extent of dedicated literature [27–33]. This article aims at filling this gap to some degree. The main reason to write this paper is to fill the literature gap in case study analysis about implementation of the ECSR concept in the energy industry especially in the heating industry.

The objective behind this article stemming from the research gap is to analyse pro-environment activities within ECSR that heating operators carry out, using the example of a case study done in Poland-based company called Miejska Energetyka Ciepła Spółka z o.o. with headquarters in Koszalin. In particular, this study focuses on pro-environment activities that the company has been involved in across 2017–2020.

The following question was posed:

- What pro-environment activities did Miejska Energetyka Ciepła in Koszalin carry out in 2017–2020?

The following discussion includes an analysis of such activities in terms of their compliance with the ECSR strategy action plan adopted by the company.

## 2. Literature Review

The dynamically growing economy demands that organisations take action by following business management models oriented on profits as well as on certain economic aspects and, broadly defined, social aspects [34–36]. Rising expectations and requirements of stakeholders put direct pressure on decision making and initiatives in terms of the ecological development of an organisation [37,38]. The expanding role attributed to ecological aspects makes businesses think and act towards environmental social responsibility [1]. It calls for certain necessary proportions that organisations need to keep between their areas of activity when facing the challenge of establishing a balanced functioning and a stable development in the ecological (environmental)-economic-social area [39,40]. The application of the new philosophy in business management and in functioning of organisations within the framework of ECSR, and its future success on the market, chiefly depends on human resources, methods of implementation (aware and responsible) and the organisational culture [6,9,41]. Different ECSR implementation methods need to be based on appropriate values of an organisation and its staff [39,42–44], further yielding direct influence on communication and relationship building with the surroundings. Notably, building responsibility towards own employees will demand that, first and foremost, an organisation satisfies requirements and expectations resulting from CSR, and then follows up with actions oriented towards protection of natural environment. The analysis of specialist literature confirms that all ECSR activities touch various aspects of how an organisation functions, its areas, and are based on social responsibility [45–49].

The popularity gained by corporate social responsibility in the area of environmental protection has a result of its compliance with business management standards [50–52] based on ISO 26000, and partly ISO 14001 [53,54]. The international standards defined the degree of responsibility a business has for its activity in the area of environmental protection, social responsibility, care and use of natural resources, and actions taken to protect the environment, biodiversity and follow related laws [55,56]. Organisations adopt decision-making strategies and take aware actions (and it includes heating sector entities) that meet expectations and requirements of stakeholders in the area of both improvement of an organisation's effective operation as well as enhancement of the ecological awareness and safety [57]. Table 1 demonstrates examples of such activities. Rising satisfaction of stakeholders with ECSR activity of an organisation will lead to high trust and commitment (loyalty), further yielding greater success on the market [42,58]. For this reason, as part of their campaigns bringing attention to ECSR activity and compliance with certain requirements organisations take part in many pro-environment contests, use official quality marks, etc. or launch original marketing/informational initiatives [59,60].

Notably, upon implementing ECSR, big enterprises have introduced higher prices and started generating significant profits by promoting stakeholder awareness of the extent of their investments made towards pro-environment objectives. Likewise, rising awareness of and building the 'ecological organisation' image [61–63] have enabled organisations to improve their market share and become more competitive [64,65]. Products manufactured by following pro-environment manufacturing processes endow the community with a sense of responsibility for the environment, including for lower deterioration of natural resources [66–68]. The improving responsibility for the natural environment follows improvement of overall wellbeing and quality of life in a society as some organisations lose customers or income due to global application of modern pro-environment solutions (e.g., power sector's PV panels, wind farms, private wind turbines) [69]. Likewise, in the heating sector this situation has been apparent due to the spread of solar panels, heat pumps, modern convector and modular stoves [70]. The result is successful because ECSR promotes pro-environment and social activities improving ecological awareness and responsibility [70,71] and directly impacts the quality of life within the People-Planet-Profit framework [34,49].

**Table 1.** Ecological activities in some functional areas of a heating sector operator. Source: [72–74].

Area	Activity	Objective
Designing	<ul style="list-style-type: none"> <li>• Identification of opportunities to use ecological features in own service offer;</li> <li>• Development of training programmes dedicated to environmental responsibility and designing;</li> <li>• Implementation of modern pro-environment solutions.</li> </ul>	To build a designing/organisational potential (resources) allowing the implementation of pro-environment solutions in the organisation, including service quality excellence and improvement of ecological awareness within the social responsibility framework.
Operations/ production	<ul style="list-style-type: none"> <li>• Adequate policies on:</li> <li>• waste management;</li> <li>• natural resources and energy use;</li> <li>• environmental protection (bio-diversity);</li> <li>• optimised manufacturing;</li> <li>• Implementation of business management systems and their excellence.</li> </ul>	<ul style="list-style-type: none"> <li>• To implement systemic pro-environmental solutions;</li> <li>• To educate and train on environmental protection, including fuel emission reduction, lower consumption of energy, resources, recycling;</li> <li>• To improve awareness and self-vigilance among the staff.</li> </ul>
Sales/purchasing	Building adequate (according to internal policies) relations with stakeholders, including in the area of ecological aspects.	<ul style="list-style-type: none"> <li>• To identify and parametrise suppliers and providers to ensure their joint accountability for ecological issues;</li> <li>• To improve awareness and measure it among suppliers and providers in relation to pro-environment and social initiatives of a heating organisation.</li> </ul>
Marketing	<ul style="list-style-type: none"> <li>• marketing ethics;</li> <li>• pro-environment programmes and other measures supporting better community awareness, including in relation to ECSR.</li> </ul>	<ul style="list-style-type: none"> <li>• To build an adequate ECSR image of the organisation;</li> <li>• To measure and assess the ecological awareness.</li> </ul>

### 3. Materials and Methods

This analysis uses a case study of a Polish company called Miejska Energetyka Ciepła (MEC) Spółka z o.o. based in Koszalin. The analysis covered ECSR activities of that company which it carried out in 2017–2020. Source materials included corporate reports and internal data obtained from the company which were then aggregated and analysed for the respective years.

Miejska Energetyka Ciepła sp. z o.o. based in Koszalin is an energy sector operator which deals in a licenced business activity involving the generation, transmission and distribution of heat energy. Its services are supplied across the city of Koszalin and satisfy ca. 60% of heat demand from all facilities in Koszalin as well as ca. 25% of heat demand in the town of Sianów.

MEC Sp. z o.o. is a local energy company, carrying out licensed activities in the field of heat generation, transmission and distribution. It provides its services in the city of Koszalin, covering about 60% of the thermal needs of all facilities located in the city Koszalin and Sianów, where it secures about a quarter of the demand for heat. The directions of activities of MEC Sp. z o.o. can be summarised in the following sentences:

- The company creates the best conditions for the supply of heat to current and future customers,
- The company has the strongest commercial brand in the district heating sector in Koszalin,

- The company uses the latest technologies in the production, transfer and distribution of thermal energy,
- The company strives to optimize the costs of heat sales, taking into account in long-term development plans the production of thermal energy in combination with electricity,
- The company takes care of the protection of the environment in the city of Koszalin, which has the title “Green City”.

MEC Koszalin’s mission is: “Friendly and ecological warmth in the place and time expected by the customer.”

According to MEC, “The primary objective pursued by MEC Sp. z o.o. is to provide customers with a reliable supply of green and safe heat at the optimal possible prices.”

Miejska Energetyka Ciepła sp. z o.o. in Koszalin strives to become a regional leader in the district heating industry and a distributor of thermal energy using environmentally safe technologies. This position will be achieved through the company’s high standards of service quality and by maintaining the optimal possible heat prices in the local district heating market.

The company has been operating on the market for over ten years. It continues the tradition and long experience of previous heating suppliers in the area which had been different companies over the years, including Miejskie Przedsiębiorstwo Energetyki Ciepłej which was created in 1970 as a successor of Zakład Gospodarki Ciepłej MZBM in Koszalin. Three years afterwards, in 1973 it was transformed into Wojewódzkie Przedsiębiorstwo Energetyki Ciepłej which distributed heat to many cities in the region (Koszalin, Słupsk, Kołobrzeg, Szczecinek, Wałcz, Świdwin). In 1975, new regions of Poland were defined, and internal borders changed. The company’s area of coverage was reduced by excluding the cities of Słupsk and Wałcz, however the town of Złocieniec was included. In 1992, Wojewódzkie Przedsiębiorstwo Energetyki Ciepłej was divided and a spin-off entity was established called Przedsiębiorstwo Energetyki Ciepłej. On 1 January 1993, it was transformed to Miejska Energetyka Ciepła sp. z o.o. A privatisation process followed up in 2001 and a private shareholder entered this state-owned entity. The shareholder was SYDKRAFT AB MALMÖ and it made a capital contribution in exchange for its shareholding in Miejska Energetyka Ciepła. In 2005, SYDKRAFT AB transformed to E. ON. Sverige Aktiebolag.

The heating infrastructure maintained by Miejska Energetyka Ciepła consists of the following:

- heat transmission and distribution infrastructure—113.4 km of heat network (including 70% pre-insulated pipe);
- 760 heat transfer stations;
- two DPM/FUB boiler plants providing total installed capacity 174.43 MW for shared use;
- two local gas-fired boiler plants providing total installed capacity 0.3 MW;
- a district boiler plant in the town of Sianów providing total installed capacity 4.7 MW and gas-fired boiler plant with capacity 0.5 MW;
- contracted capacity 134 MW;
- over 1 m GJ of heat energy sold annually.

The following are the primary areas of business:

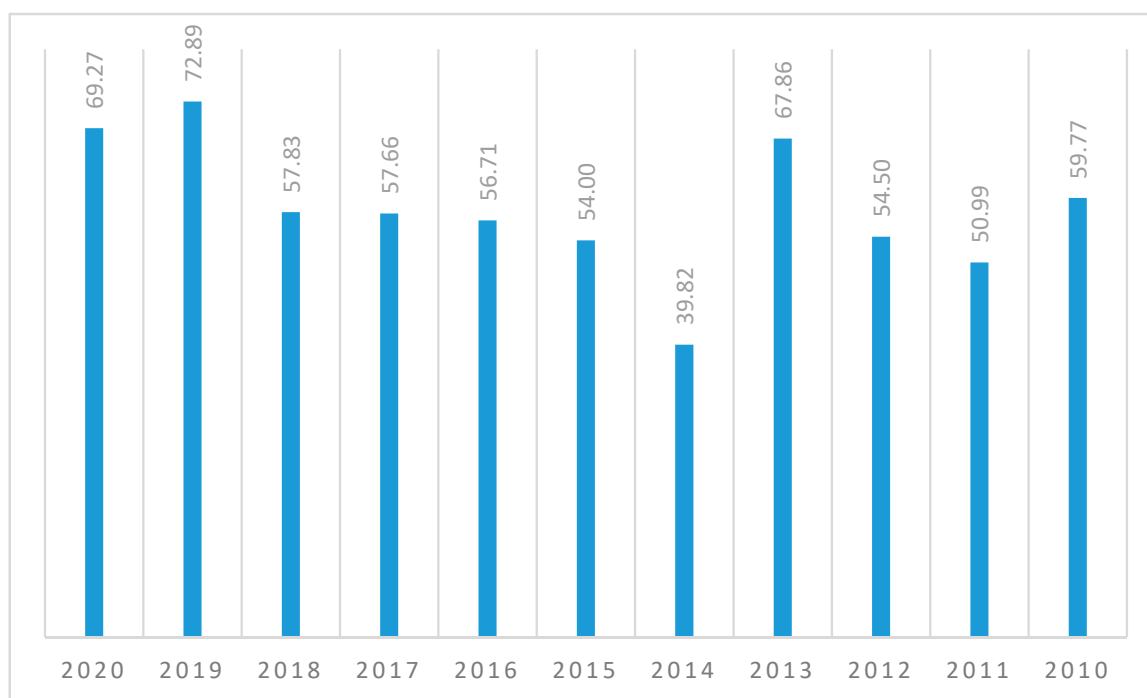
- generation, transmission and distribution of heat;
- construction, expansion, improvement and refurbishment of the heat network, related energy devices, including their maintenance;
- investment services, consulting, advisory activity, designing related to heat.

The main objectives of the organisation include:

- to respect the natural environment in and around Koszalin;
- to excel in quality;
- to operate profitably and effectively;

- to connect new users to its heat network;
- to reduce costs of heat generation/transmission/distribution;
- to closely collaborate across the source-distributor-user relationship to yield heat savings and lower costs of heat generation;
- to adapt own staff to the latest market conditions (customer-oriented model); apart from the technical quality of supply, the level of service should be reflected in proper customer communication and culture (complaints, billing, etc.);
- to address constant and high technical advancement of the heat industry; to effectively implement the latest technology and technical solutions; and to ensure innovation in heat energy generation.

Figure 1 shows the revenue of the test form in 2010–2020.



**Figure 1.** Revenues of Miejska Energetyka Ciepła (MEC) Sp. z o.o. in the years 2010–2020.

The defined mission of the organisation gives grounds for achieving such objectives and calls for efficient improvement and development efforts to be taken. The fundamental element of this action plan is to carry out an optimised investment programme which largely warrants and enables achievement of those objectives.

In our study we used the case study method. We think this method is appropriate because we wanted to identify and compare with other examples the ECSR practices realised in the energy industry. To do so the qualitative approach was the best solution. This is because the qualitative case study approach is useful in exploration of a phenomenon within its context using variety of sources [75]. To obtain data about ECSR from particular organisation is not possible to use quantitative approach because is difficult to prepare questionnaire with operationalization of the data. Also, the term of case study refers to methods of analysis for examining a problem which can be generalize across population [76].

We think that our problem can be generalized over populations because methods used to deal with ECSR implementation process by one energy organisation can be also used in another energy organisation. The analysis conducted in our case study can provide important insight to illuminate previously hidden problems about implementation of ECSR in energy industry companies on example of heating industry.

In our analysis, we used first desk research of the reports developed by organisation. Also, we used many internal documents using within an organisation. To have better

knowledge about ECSR actions conducted by organisation we also carried out in-depth interviews with managers in the organisation.

#### 4. Results

A very important aspect of the company's involvement in ECSR is how it performs environmental management. Its operations are based on a sustainable development policy which aims at ensuring the continuous growth of the organisation while respecting and taking care of the natural environment.

In 2017, the company implemented an environmental management system according to ISO 14001:2015. The main document setting forth the key environmental objectives of the company is the environmental management policy. The policy reflects the degree of influence and the scale of impact on the environment. It is also the fundamental document for setting other goals and tasks in that area.

The company defined the following main directions of its activity in the area of environmental protection:

- to achieve environmental goals and tasks;
- to reasonably use energy and water resources (including to lower consumption of electricity and utility water);
- to minimise waste and achieve environmentally safe waste management, by optimising the company's activities and by sorting, storing and moving waste to recycling/treatment providers;
- to reasonably use resources;
- to improve cooling of the heat medium in heat transfer stations;
- to maintain low emission of air pollutants, by implementing the latest technical solutions that are environment-friendly;
- to satisfy all regulatory requirements (including for emissions) according to statutes and other regulations in the area of environment, occupational health and safety;
- to periodically review and identify any new aspects to address; to give priority to environmental aspects; and to take actions preventing contamination of the natural environment;
- to implement a waste management policy that will be environment-friendly and warrant waste sorting, reuse and recycling as well as further treatment as needed according to the regulatory environmental requirements.

The board of the company is responsible for establishing and maintaining the environmental policy, and for ensuring proper conditions enabling its implementation, so that each staff member and collaborator of the company can fully engage in the process of achieving the defined environmental goals.

By introducing the policy, the board has declared its commitment to create conditions that enable the implementation of the policy across all areas of the company's activities as well as achievement of the defined environmental goals.

According to the environmental policy:

- it appropriately reflects the objectives of the company's activity as well as its external and internal context;
- it is based on the company's strategic growth directions and supports them;
- it sets forth a framework for determining environmental goals;
- it expresses personal commitment to create conditions needed to implement the policy across all areas of the company's activity, and to achieve the defined environmental goals;
- it is formulated based on the principle of mitigation of threats and leveraging of opportunities.

On the basis of such environmental policy, the board and the staff/collaborators of the company undertake to:



- maintain and continuously enhance the Environmental Management System according to PN-EN ISO 14001:2015;
- constantly develop effectiveness of that system and ensure resources needed for its proper operation and development;
- protect the environment, including prevent its contamination;
- satisfy regulatory compliance requirements (including legal requirements applicable to the company's operations).

The majority of the investment, improvement and organisational activities which the company has been carrying out in the recent years are directly connected with environmental protection. The main directions of ECSR activities are:

- to improve technical parameters of atmospheric emissions;
- to greatly reduce PM emissions by applying high-efficiency extraction devices;
- to lower carbon oxide emissions;
- to diminish hydrocarbon emissions;
- to enable reduction of SO<sub>2</sub> emissions when fuel is changed to a better one;
- to greatly improve technical parameters of emissions: time and temperature of combustion, height of emission source, travel of combustion gases;
- to reduce consumption of energy media;
- to lower emissions of air pollutants and volume of waste;
- to limit heat losses;
- to improve environmental management.

The primary environmental protection activities which the company carried out in 2017–2020 included:

- thanks to the promotion of lower heat demand (thermal performance improvements and heat automation systems), the company managed to produce less air pollutants because its efforts has led to reduced consumption of fuel;
- improved quality of fuel (high-quality fuel only that contains less ash and sulphur);
- reduced consumption of fuel thanks to better performance of heat transfer devices (upgraded boilers improved performance by ca. 5 percent);
- lower overall consumption of fuel (by 10–15 percent) thanks to better performance of main heat transfer devices;
- limited heat losses in heat network;
- reduced consumption of electricity (thanks to frequency transducers ensuring smooth adjustment of pumps and vents);
- improved heat transfer stations;
- eradicated local coal-fired boiler plants;
- eradicated old heat transfer technology (improved system safety and lower consumption of heat by ca. 17 percent).

According to corporate documentation, the board has been striving for its staff/collaborators to be aware of and respect the environmental policy as well their own accountability for the effective implementation of the policy. The promotion of such pro-environment principles among the staff can also lead to better practices in private life and further spread the environment-friendly world concept.

In particular, the company is very much engaged in a number of pro-environment educational projects related to ECSR. Table 2 lists such projects dating back to 2017–2020. The activities are divided into four categories:

- educational projects related to environmental protection;
- environment-oriented promotional campaigns (leaflets, films, articles, sign boards);
- sponsoring activity related to environmental protection;
- other actions enhancing the community.



**Table 2.** List of Environmental Corporate Social Responsibility (ECSR) educational projects of Miejska Energetyka Ciepła Sp. z o. o. in Koszalin, 2017–2020. Source: own study.

	2017	2018	2019	2020
Educational projects related to environmental protection	<ul style="list-style-type: none"> <li>district heating presentations in pre-school and school facilities (informational books, lecture scripts)—up to ten sessions per academic year;</li> <li>events around the national tree day (tree planting with pre-school and school facilities);</li> <li>annual fair for a few thousand city habitants, including an environmental art contest for children;</li> <li>annual maintenance of a falcon nest on a heat plant chimney.</li> </ul>	<ul style="list-style-type: none"> <li>district heating presentations in pre-school and school facilities (informational books, lecture scripts)—up to ten sessions per academic year;</li> <li>events around the national tree day (tree planting with pre-school and school facilities);</li> <li>annual fair for a few thousand city habitants, including an environmental art contest for children;</li> <li>annual maintenance of a falcon nest on a heat plant chimney.</li> </ul>	<ul style="list-style-type: none"> <li>district heating presentations in pre-school and school facilities (informational books, lecture scripts)—up to ten sessions per academic year;</li> <li>events around the national tree day (tree planting with pre-school and school facilities);</li> <li>annual fair for a few thousand city habitants, including an environmental art contest for children;</li> <li>annual maintenance of a falcon nest on a heat plant chimney;</li> </ul>	<ul style="list-style-type: none"> <li>suspension of periodic events due to the COVID-19 pandemic;</li> <li>annual maintenance of a falcon nest on a heat plant chimney; nest replacement and assembly of online cameras.</li> </ul>
Environment-oriented promotional campaigns (leaflets, films, articles, sign boards, etc.)—up to 20 publications in local media (magazines/newspapers, TV stations, web portals)	<ul style="list-style-type: none"> <li>annual informational events in the local media (magazines/newspapers, TV stations, web portals) on the company's pro-environment activity and its investments;</li> <li>participation in construction trade fairs (promotion of environment-friendly district heating solutions, environmental educational through an online gaming app called "Scare the Smog" [Wygoń z miasta czarny smog])</li> <li>workshop visits by students from the local technical university (Politechnika Koszalińska).</li> </ul>	<ul style="list-style-type: none"> <li>annual informational events in the local media (magazines/newspapers, TV stations, web portals) on the company's pro-environment activity and its investments;</li> <li>participation in construction trade fairs (promotion of environment-friendly district heating solutions, environmental educational through an online gaming app <i>Scare the Smog</i> [Wygoń z miasta czarny smog])</li> <li>workshop visits by students of the local technical university (Politechnika Koszalińska).</li> </ul>	<ul style="list-style-type: none"> <li>annual informational events in the local media (magazines/newspapers, TV stations, web portals) on the company's pro-environment activity and its investments;</li> <li>participation in construction trade fairs (promotion of environment-friendly district heating solutions, environmental educational through an online gaming app <i>Scare the Smog</i> [Wygoń z miasta czarny smog])</li> <li>workshop visits by students of the local technical university (Politechnika Koszalińska);</li> <li>award of <i>No Smog</i> certificates to district heating users.</li> </ul>	<ul style="list-style-type: none"> <li>annual informational events in the local media (magazines/newspapers, TV stations, web portals) on the company's pro-environment activity and its investments;</li> <li>suspension of trade fairs and student visits due to the pandemic.</li> </ul>

Table 2. Cont.

	2017	2018	2019	2020
Sponsoring activity related to environmental protection (e.g., children contest awards—quantities and sums)	<ul style="list-style-type: none"> <li>annual contest for pre-school facilities “District Heating in my Home” (PLN 500–1000);</li> <li>prizes for attendees of district heating presentations (PLN 1000);</li> </ul>	<ul style="list-style-type: none"> <li>annual contest for pre-school facilities “District Heating in my Home” (PLN 500–1000);</li> <li>prizes for attendees of district heating presentations (PLN 1000);</li> </ul>	<ul style="list-style-type: none"> <li>annual contest for pre-school facilities “District Heating in my Home” (PLN 500–1000);</li> <li>prizes for attendees of district heating presentations (PLN 1000);</li> </ul>	<ul style="list-style-type: none"> <li>annual contest for pre-school facilities “District Heating in my Home” (PLN 500–1000);</li> </ul>
Actions enhancing the community (details, quantities, periods, sums)	<ul style="list-style-type: none"> <li>pro bono, charity, culture and similar donations—PLN 47,000</li> <li>organisational involvement in tens of events every year (scientific, recreational, cultural, sports, including nation-wide events).</li> </ul>	<ul style="list-style-type: none"> <li>pro bono, charity, culture and similar donations—PLN 35,000</li> <li>organisational involvement in tens of events every year (scientific, recreational, cultural, sports, including nation-wide events).</li> </ul>	<ul style="list-style-type: none"> <li>pro bono, charity, culture and similar donations—PLN 40,000</li> <li>organisational involvement in tens of events every year (scientific, recreational, cultural, sports, including nation-wide events).</li> </ul>	<ul style="list-style-type: none"> <li>pro bono, charity, culture and similar donations—PLN 150,000 (major increase due to direct hospital/hospice aid due to the pandemic);</li> <li>aid for local government authorities to help arrange disinfectant and face mask supplies;</li> <li>suspension of periodic events due to the pandemic.</li> </ul>

In its ECSR efforts, the company pays considerable attention to environmental training of its own staff, as well. In 2017–2020, the training covered the following topics:

- challenges in energy and heating sectors from the perspective of environmental protection;
- protection of air: new requirements;
- waste management;
- Environmental Protection Academy—regulatory changes;
- 6th Edition—co-generation project development factors;
- Environmental Protection Law Academy—key changes;
- Waste Law amendment of July 2018;
- session at National Environmental Protection Fund (NFOŚiGW) in Warsaw;
- new waste management rules on local government level;
- waste incineration plant strategy vs reality.

The company also puts emphasis on the environmental education and awareness of the youngest generation and to that effect has been participating in a district heating promotion programme organised by IGCP, a Polish heating sector association. There were periodic classes arranged in pre-school and school facilities where carers and teachers conveyed basic knowledge about heat, its sources, the generation process, its impact on the environment and things to do in order to save energy. Such classes were often integrated with children art contests and awards—informational books *Little Red Riding Hood and Smog* [*Czerwony Kapturek kontra smog*]. Children of higher grades participated in district heating classes which were based on teaching scripts prepared by the programme authors.

Another interesting project which promoted the environment-oriented mindset was *Ecological Kids* [*Ekologiczne przedszkolaki*]. In this project, the company regularly invited children from local pre-school facilities so that younger generations could experience how

the heat generation process looks like and find out about options to reduce pollutants in the air (particular matter, oxides, and sulphur/nitrogen compounds). Children also observed how pre-heated water reaches the other side of a town at very remote locations.

Pre-school and school children frequently visit facilities of the company also during the heating season. They can check boiler plants and see how fuel actually burns in boilers. When visiting a control room, they see cutting-edge control systems in actual operation: how boilers and giant pumps are monitored and how telemetrics is used to control the entire heating system in a town.

In its marketing activity the company follows its CSR policy by supporting local communities in their sports, cultural, scientific, recreational life, both on a local and nation-wide level. The company's commitment to ECSR activities has been recognised in 2020 when it was awarded *Silver Denar*, a commercial prize for mid-size enterprises. The contest aims at promoting commercial operators who show pro-environment and pro-community involvement.

The contest promotes activities of operators who supply environment-friendly heat through district heating solutions, because heat generated in large heating centres, which are equipped with the latest PM removal systems, de-sulphurisation processes and upgraded boilers, warrants the lowest possible impact on the environment. The contest also targets potential users of district heating to encourage them to connect to district systems and reduce emissions by eliminating private stoves.

Mass media is also used to spread information about the company's investment projects which have positive impact on lower levels of pollution. Information is published about scientific conferences which the company co-hosts with a local technical university (Politechnika Koszalińska), for example the annual *Heating Forum* which is dedicated to state-of-the-art technology in the heating sector, and *Heat and Mass Conference*.

By following CSR principles, the company engages also in initiatives that bring change to the local community. Some examples of its CSR efforts include support for creation of *Zucchini* wall painting in a hospice based in Koszalin. The mural was created in August 2020, thanks to the aid received from Miejska Energetyka Ciepła. The mural occupies the biggest wall next to a building of the hospice. Patients can enjoy a very colourful yet peaceful view that fills the area with space, movement and sunlight.

Also, in August 2020, the company joined widespread efforts aimed at helping COVID-19 patients. The company donated an anaesthetisation device to a regional hospital based in Koszalin.

Table 3 lists expenses related to ECSR activities of the company across 2017–2020. The highest cost was incurred in 2017 when an integrated management system was implemented and certified. In 2020, the expenses were lower due to COVID-19 pandemic which caused a number of projects (training) to be suspended and others (re-certification processes) rolled over to the next year.

**Table 3.** List of ECSR activities of Miejska Energetyka Ciepła Sp. z o. o. in Koszalin, 2017–2020. Source: own study.

	2017	2018	2019	2020
ISO 14001:2015	Implemented an integrated management system PLN 24,450	Periodic audit PLN 11,200	Periodic audit PLN 11,200	Re-certification 30% incurred in 2020 (PLN 7155) The rest will be incurred in 2021.
Environmental protection training	PLN 1800	PLN 8400	PLN 5600	PLN 150
Staff promotion	PLN 7678	PLN 8243	PLN 2020	PLN 0
Total	PLN 33,928	PLN 27,843	PLN 18,820	PLN 7305

## 5. Discussion

The activities described in this article follow the Environmental Corporate Social Responsibility strategy which the analysed company implemented. The ECSR activities in the analysed company were in accordance to the classical ECSR model developed by Leon and Moon, Gunther et al. who strictly distinguished pro-environment efforts and pro-environment expenses as integral elements of ECSR implementation in an organisation [77–79]. The usual four areas of ECSR are: social, economic, technological and physical [27,80].

The activities carried out by the analysed company imply the presence of all such model elements. The social activities were oriented towards the community, among others based on educational projects and certain community efforts. Technological measures were likewise present in the company's activities (emission reductions, technical system improvements) that focused on the improvement of production processes according to ECSR. Technological area of ECSR in the analysed company consisted with improvements leading to improve technical parameters of emission, reduction of CO<sub>2</sub> emission, reduction of SO<sub>2</sub> emission, reduction of consumption of electricity and the improvement in head transfer station. The physical aspects of the analysed ECSR efforts were connected with improvement quality of fuel used by company and the reduction of heat transmission losses. As summarised in Table 3, all the activities had a financial dimension, and therefore they can fulfil the economical aspect of the ECSR model.

In the analysed organisation, the key element of ECSR implementation was ISO 14001:2015 certification which confirmed the integrated management system implemented in 2017. The system allows controlling key environmental aspects in the organisation. The significance of ISO 14001 implementation in ECSR framework of an organisation has been underlined by many authors, including Punte and Christmann [81,82].

ISO 14001 implementation has laid the foundation for the introduction of a number of pro-environment efforts. In particular, the company focused on improving technical parameters of its facilities, reducing emissions of e.g., PM, carbon oxide and SO<sub>2</sub>. It also concentrated on lower consumption of energy media, less heat losses and improved environmental management. The enhanced technical condition of devices and systems as well as the reduced emissions all have an impact on the ecological community well-being. This is a crucial area that must be considered by all organisations driven by ECSR [28,62,83–86].

Other studies conducted within energy sector about ISO 14001 implementation and its effects point out the positive environmental effect of this implementation. Laskurian points out that using ISO 14001 standard is a good starting point for organisations dealing with energy management and reduction of the energy usage [87]. Also, in our research we found out the reduction of energy usage as an effect of ISO 14001 implementation within the company. But from energy usage point of view the usage of ISO 14001 is non sufficient because this standard does not specifically emphasize energy management for environmental purpose [87]. It would be good to implement also ISO 50001 standard to put more emphasis on important issue of energy management and energy saving. The same results were obtained by Zobel and Malmgren [88]. They analysed management system approach for industrial energy efficiency improvements. According their research, the ISO 14001 standard is a good starting point in the energy saving process but, in the future, to achieve best results, the implementation of ISO 50001 is required.

The analysed company was particularly involved in certain promotional/educational projects, as demonstrated in Table 2. In 2017–2020, the company carried out a number of educational events targeted at adults as well as children. Special attention should be drawn to pre-school education which exemplifies how sensitive the company was to ecology and community aspects. The educational activity of the company satisfies criteria of the ecological community involvement. According to specialist literature [62,89–92], this area of involvement is emphasised as very important for shaping the ECSR strategies of organisations.

The importance of environmental issues in the realisation of CSR strategy in energy organisation was pointed out by Cyfert. He asserts that company involvement in the

realisation of environmentally aware customer requirements requires the implementation of Industry 4.0 within the organisation [93]. In the researched organisation all implemented pro-environmental technical solutions in last four years were also connected with Industry 4.0. In particular, the technical solutions used by the analysed heating industry organisation which are eradicating old heat technologies, are digital and are in accordance with Industry 4.0 requirements.

Such campaigns help future generations to become environmentally conscious consumers who will be able to understand the significance of ecological aspects in both private and professional life. In addition to this targeted activity, the company also hosted other types of pro-environment events, such as tree planting and falcon nest maintenance.

The company also carried out widespread informational campaigns which informed about its pro-environment activity. This activity involved publications in the local mass media, participation in trade fairs, workshop visits to its facilities, and involvement in various cultural, recreational and sports initiatives.

The conception used in analysed company—the realisation of the ECSR strategy by decrease of pollution and conduction of many pro-environmental activities—are in accordance with Milojević conception of analysing of CSR performance in energy companies [94]. In the case of environmental aspects of CSR, he points out many indicators which were used in our study and which are improved by analysed Miejska Energetyka Ciepłna company. For example, it is a case of compliance with regulation, transportation, energy consumption, greenhouse gases emission, pollution, consumption with environmental resources and compliance with environmental standards. The importance of ECSR implementation in energy companies was also pointed out by Hong and Chao [56].

The studied educational efforts promoting the district heating system implemented the objectives of *District Heating and Cooling Strategy*, a European-level framework. The strategy assumes introduction of projects that improve energy and climate awareness in the community. One of the key points of the strategy is implementation of long-lasting educational programmes and encouraging rational use of energy [95,96].

The ECSR policy of the company complies with *Clean Heat 2030* [*Czyste ciepło 2030*], a national-level heating strategy [97], as well as with specific European strategies, including but not limited to: CAFE Directive (Clean Air for Europe) [98], NEC Directive (National Emission Ceilings) [99], IED Directive (Industrial Emission Directive) [100], MCP Directive (Medium Combustion Plants) [101].

The data and information found in this study demonstrate that the company systematically devoted its financial resources to pro-environment efforts in terms of both ISO 14001 maintenance as well as educational/promotional activities.

According to the findings, the company has been highly committed to ECSR issues. The implementation of its strategy in this field can lead to ecological innovation and help establish an effective business model that will be founded on ecological assumptions.

One of the important actions connected with ECSR conducted by the analysed company regarded greenhouse gases emission. Also, other studies on ECSR implementation point out that the reduction of these emissions is a very important part of ECSR strategy [102]. For example, according to Rashid [27], ECSR is referred as resource and energy efficiency. He describes a gas emission reduction as an effect of ECSR implementation in Asia Project (GERIAP).

Some studies point out effects which did not exist in our research. For example, Seroka-Stolka observed a decrease of costs within the company as an effect of ECSR implementation [103]. We did not observe such an effect in our research. Rashid [27] observed the influence of ECSR implementation on customer loyalty, but we also not identify such effect.

The company's ECSR implementation model reflects similar measures that are used by heat generators in other countries, as well. For example, a Korea-based company called Korea District Heating Corporation (KDHC) has been implementing its ECSR strategy as shown in a CSR report [104–107]. Between the analysed Polish company and the

Korea District Heating Corporation, there are many similarities in their realisation of ECSR strategies.

The Korean organisation also implemented ISO 14001 and aims at reducing pollution. According to KDHC report, the effects of its ISO 14001 implementation and other ECSR actions are: improvements of the emission systems; reduction of greenhouse gases and air pollutants; savings in energy; development of technologies to reduce greenhouses emissions, using eco-friendly fuel [105]. All these effects are similar to the researched Polish Miejska Energetyka Ciepła Spółka z o.o. company. Also, in the Polish organisation we can observe decrease in greenhouse gases emission (especially CO<sub>2</sub>); using of new technologies, decrease of energy usage and improvement of fuel to be more eco-quality.

The Korean company engages in community initiatives, too. Like the Polish organisation, it tries to discover and promote the social contribution projects open to public and in collaboration with residents, local governments and organisations. Also, it tries to continuously come up with social contribution programs which encourage the public participation and take account the characteristic of the project [104–106].

What gives the Polish company a rather unique value is its very strong focus on the promotion of ecological awareness among young children [108–110]. The analysed Polish company is strongly engaged in educational projects related to environmental protection focused on pre-school and school children. This is a good approach and strong point of the analysed Polish company ECSR strategy. In this way, the company can educate young people to be environmentally aware and commit to environmental issues.

The unique value of the Korean company which is not realised in the Polish firm is the introduction of ECSR approach into the supply chain. The Korea District Heating Corporation is developing a contract system that emphasizes social responsibility [104–106]. This is worth implementing in the Polish company as well.

## 6. Conclusions

In our research, we analysed the realisation of ECSR strategy in Polish heating industry company Miejska Energetyka Ciepła in Koszalin. According to our analysis we identified all ECSR activities conducted by company in years 2017–2020. We observe that the company has an ISO 14001:2015 system with an environment policy. The policy is with accordance to ISO 14001 requirements and reflects the objectives of the company environmental activity as well as its external and internal context. The policy also expresses a personal commitment to create conditions needed to implement it across all areas of the company activities.

The implementation of ISO 14001 and ECSR strategy in the company brings many positive effects connected with the decrease of the emission level of pollutant gases, improvement of technical parameters of emissions as time and temperature of combustion, reduction of consumption of energy media, reduction of heat losses, improvement of the quality of fuel, improvement in all the processes connected with environmental management.

According to analyses of similar case studies we observed that the ISO 14001 implementation has positive effects on organisations ECSR results but is not enough especially from energy saving point of view. To achieve better effects in energy saving organisation needs in the future implement also ISO 50001 standard dedicated to energy management.

In 2017–2020, the analysed organisation engaged in many educational projects connected with ECSR. It realised a project connected with environmental protection. Projects were targeted at young people—pre-school and school. Also, the organisation conducted many environmentally oriented promotional campaigns with leaflets, films, articles, sign boards, etc. It published up to 20 publications in the local media about its pro-environment activity. Another important activity of the company is its sponsoring of environmentally friendly activities. The company organised a contest for children and funded awards for attendees of the district best heating presentation.

Based on our research and competition with other related papers, we can say that the implementation of ECSR is very important for energy companies and is worth carrying



out. We should use the analysed case study as an example of best practices adding some solutions from other companies and use them as role models in the heating industry.

In the future, the company should take actions to expand its activity also across the other CSR areas, especially in the community area. Although the company has already taken initiatives in those areas they are not quite as systemic yet to allow us to say that the company fully satisfies the CSR strategy and needs of all stakeholders.

The areas for recommended improvement include:

- implementation of ISO 50001 standard,
- introduction of ECSR in the supply chain,
- annual CSR reporting,
- implementation of CSR-dedicated standards (e.g., ISO 26000).

## 7. Limitations

The key limitation of this analysis is the case study method which focuses on one heat generation company only. We think it is good example but in the future it would be worth analysing similar companies to compare the ECSR implementations and the effects of this process. Also, another limitation is the short time frame (2017–2020) we took into account in our analysis. However, the discussed ECSR activities are relatively universal and could be applied to other organisations in the field.

## 8. Implications

The results of our research have enhanced the theoretical basis of the methods and results used by energy industry companies in ECSR implementation. The study fills a scientific gap regarding the analysis of ECSR realisation in heating companies. On the basis of our research, we identified best practices that can be used in other similar companies especially from heating industry. The main business implication of the study is in the possibility of other companies seeing these results and following suit. In this way they too can reduce their pollution levels, organize environmental action and become environmentally friendly. The conducted ECSR actions can also have impact on the image of the organisation. In today's market, as was pointed out by Rashid [103], an eco-friendly image can bring us more loyal customer and can be economically rewarding.

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