

WASTE INCINERATION IN POLAND



The importance and analysis of Social Sustainability regarding new Waste Incineration projects in Poland

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Marlena Szelag

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Sustainable Energy Planning and Management, Department of Development and Planning

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Title: The importance and analysis of Social Sustainability regarding new Waste Incineration projects in Poland

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A sustainable energy system is a worldwide shared and desired concept amongst the European countries. Poland is one of them. Having imposed number of European requirements regarding decreasing of CO_2 emissions, Poland turns to the subject of waste incineration. However these systems result being named as somehow controversial. The purpose of the report is to help to understand reasons of Poles being sceptical about waste incineration plants. In other words, the presented study is led by the following research question:

Can waste incineration play a sustainable part of Poland's energy supply?

The report analyses aspects of social sustainability regarding waste incineration projects. While Poland's main source of energy is hard coal, landfills are filling in the worryingly increasing rate. Looking at the examples of Northern and Western Europe countries, Poland lies behind in recycling and energy recovery installations. The analysis is based on the qualitative data, namely interviews and available documents concerning case studies. The results present not the lack of technology or economic benefits; it is the lack of willingness by communities as their feelings are concentrated on the unfairness towards them by the organisers. This report shows examples of unfulfilled characteristics of social sustainability.



Aalborg University Sekretær: Dorte Holmgaard Jensen Tlf.: +4599408448 E-mail: dorteh@plan.aau.dk

Preface

This thesis is submitted partial fulfilment of the requirements for a Master's Programme in Urban, Energy and Environmental Planning at Aalborg University. It contains work done from February to May 2016. The research was conducted under the supervision of Poul Alberg Østergaard, Professor in Department of Development and Planning and the coordinator of the semester. This work is to the best of my knowledge original, except where acknowledgements and references are made to secondary sources.

In October 2014, firm Ekokogeneracja S.A. proposed the investment based on the construction of a plant for the production of thermal energy from the process of gasification of alternative fuel from combustible fraction of municipal waste. An installation which would fulfil the European requirements and contribute in decreasing waste stored in landfills. The whole project failed in the process of building the installation due unawareness of importance of the aspects of social sustainability. Following this case and several smaller, this paper brings together number of disappointing but true issues that bother communities of small towns in Poland.

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Chapter 1: Introduction

Energy security is a strategic issue for all countries. For almost all countries, the generation and distribution of electricity is the economic lifeblood, which along with the transport system determines the efficient functioning of the country and thus economy. In short, economic development of the country is dependent on access to energy. It is predicted that by 2040 the world economy will grow at an average rate of 2.8% per year, with a current growth at 2.5% (Conference Board, 2016). Taking into account an expected constant increase of the efficiency in energy production, the increase in the global energy sector will be 1.1% per annum. It is expected that the relative importance of conventional energy sources will decline (energy from coal and oil - projected growth of 0.4% per year), while shares of renewable sources will grow more than the 1.1% general rate (solar, wind and geothermal - an increase of 7.4% per year) (PAIZ S.A, 2013).

At the same time, in recent years the global economy has seen a number of negative phenomena. Significant fluctuations in energy commodity prices, growing demand for energy on the part of developing countries, serious failures of energy systems and the increasing pollution of the environment require a new approach to energy policy. As part of their environmental obligations, the European Union has set for 2020 quantitative targets, the so-called. "20-20-20", i.e. .: a reduction in greenhouse gas emissions by 20% compared to 1990, reducing energy consumption by 20% compared to projections for 2020 EU; Increasing the share of renewable energy to 20% of total consumption energy in the EU, including increasing the use of renewable energy sources in transport to 10% (Ministry of Economy, 2009).

The Polish energy sector is currently facing serious challenges. A high energy demand, an inadequate level of development of infrastructure, manufacturing and transportation of fuel and energy, significant dependence on external supplies of natural gas and an almost 100% dependence on foreign supplies of oil and obligations in the field of environmental protection, including the climate, make it necessary to take decisive action to prevent the deterioration the situation of fuel and energy customers in Poland (Ministry of Economy, 2009).

1.1 Energy Mix in Poland

Poland has been a member of European Union since 2004. Country is divided into voivodeships, each having different qualities and resources. Most natural resources are generated in south and south west of Poland: Dolnoslaskie and Slaskie (voivodeships) (Figure 1). Voivodeships are subdivided into counties, and these are divided into municipalities. In this country of 38.4million people there are currently 16 voivodeships, 379 counties and 2478 municipalities (IEA, 2011).



Figure 1: Map of Poland divided into voivodeships (IEA, 2011)

The primary energy supply in Poland was almost 3977.5 PJ in 2009, much lower than the peak of 5568.4 PJ reached in 1987. It dropped significantly in the 1990s as a result of reduced economic activity in the first half of the decade and as a result of structural transformations in the economy and a substantial improvement in energy efficiency as a country moving away from a centrally planned economy to a market economy. On average, the total primary energy demand fell by 1.2% annually in the period 1990-2002 (IEA, 2011).

Pozyskanie energii pierwotnej

Primary energy production



Figure 2: Primary energy production. Source: (GUS, 2015)

Figure 2 present the production of primary sources in Poland in 1997-2014. The significant fuel produced in the country is hard coal. It is the world's ninth biggest coal producing country, and after Germany, it is the second largest producer of coal in Europe as well as having operating Europe's biggest coal-fired power plant. It is also a third largest producer of lignite. Figures 3 and 4 below present a structure of household energy consumption per 1 inhabitant in Poland in 2012 (GUS, 2015). As seen the majority of the household energy consumption is hard coal. Second place is a district heating network, which in comparison with the same data across EU is much bigger. District heating is a popular heating system in majority of cities in Poland, independent of their size. It is predicted that district heating network in years 2010-2030 will expand by 15%. However heating enterprises also meet the competition from alternative heat sources, such as individual systems or small local heat generating systems (PwC, 2012).



Figure 3: Structure of household energy consumption per 1 inhabitant in Poland. Source: (GUS, 2015)



Figure 4: Structure of household energy consumption per 1 inhabitant in EU. Source: (GUS, 2015)

Also these figures show the similarity of levels of biomass use in Poland and EU; the average throughout Europe and Poland differ only by 0,7%. Poland is rich in biomass sources and as it is a Renewable Source, it is one of the main factors to help Poland reach the requirements set by EU. (Dach, J., Pilarski, K., 2012)

1.2 Issues in Polish energy systems

According to PwC, investments in production capacity of district heating are mainly enforced implementation of the directive on industrial emissions (Directive 2010/75/EU) establishing emission standards, which will take effect from 2016. Contained in are regulatory standards for SO₂, NO_x and dust referring to all sources with a thermal capacity of at least 50 MW. Compared with the current regulations, new standards contained in Directive 2010/75/EU are much more restrictive. For example, the standard emission of sulphur dioxide for plants firing coal for thermal power in the range of 50-100 MW in the new directive is 400 mg / m³ compared with the current norm of 1 500 mg / m³. For most plants (with a thermal input of more than 400 MW), the current standard of SO₂ emissions will be cut by half (from 400 mg / m³ to 200 mg / m³) (PwC, 2012).

According to an article published by ENERGYDESK, Poland will have trouble meeting targets set by the European Commission. If Poland will not create a plan and start realizing it soon, it will be taken to the EU Court of Justice. However, it did design a strategy to satisfy the Commission that manages coal pollution and tackling transport and household emissions. These two sectors contribute significantly in emitting PM10¹, however it is the industry and energy sector that cover the majority of data and additionally produces in great amounts toxic particulate PM2,5. Poland's air pollution causes approximately 43 000 deaths a year of which 5 300 people are killed by pollution produced by coal-fired power plants. Poland is a home of 6 out of 10 most polluted cities in Europe, where it took only three months for Warsaw, Krakow and rest of cities to exceed the EU's air pollution allowance for the whole year (Boren, 2015).

A European Commission statement says that latest figures from Poland shows that maximum daily limits of the PM10 particle release exceeds in 35 out of 46 air quality zones, with yearly limits being exceeded in 12 zones. The above mentioned plan should have been in place since 2005 to protect citizens' health and the Commission is asking Poland for an effective and fast action to keep the period of non-compliance as short as possible (European Commission, 2015).

Just a month after the above statement, a law to ban coal-fired stoves and wood burning in Krakow came out. It is to take effect in 2019. Poland's former leading party accepted an antismog law as a run-up to its parliamentary election in October 2015, however the elected party Law and Justice initially opposed the law and decided to amend it if the impacts were too

¹ PM10 – A general term for organic air pollutants measuring 10 or less microns in diameter, which are linked to increased respiratory morbidity and mortality Segen's Medical Dictionary (2012)

troublesome for the coal industry (Easton, 2015). Poland is unwilling to act on this law, since selling expensive quality coal to households is the main source of income for Polish coal mines. Coal is also the main fuel of the country's industrial power generation with increased production cost, however mines are forced to sell the fuel for lower prices because of the long-term contracts with energy companies (Easton, 2015).

The costs of heating dwellings in Poland in the future will probably increase due to the need to purchase CO_2 emission allowances by heat producers and the need to replace or upgrade old infrastructure and manufacturing network (PwC, 2012).

1.3 Policies and goals: EU and Poland

New waste incineration plants in Poland are also the reason to manage future reforms of the emission trading scheme proposed by European Commission. It includes the plan of decreasing the emission of CO_2 and increase the investment in renewable power sources. Despite the seemingly good solutions, this plan is a big challenge for Poland, because the emission price will rise and investments are expensive. Professor Swirski, energy and IT expert, CEO of Transition Technologies, highlights that "it is clearly said that compared to 2005, our carbon dioxide emissions in the energy sector is expected to fall by 43 percent by 2030" (Swirski, 2015). Also professor Swirski admits, that Poland does not have much of a choice. In terms of the country's energy mix mainly based on coal technologies, every EU regulation requiring decrease of a CO₂ in energy is a challenge. It is also well noticed that changes will be expected to have results very soon. Additionally it is worth to pay attention to MSR - Market Stabilization Reserve, which is a mechanism to increase the prices of a CO₂. The system might increase the CO₂ prices from current 6 Euros to 30-40 Euros by 2030 (Eurofer, 2014). Prof Swirski also mentions a system of free CO₂ allowances, which is proposed to the poorest countries in EU, which also includes Poland. However, these are not unconditional and for everyone. It is proposed for these theoretically free allowances to be assigned at the auctionthese power stations will 'win' which will show the diversity of a source of energy mix and low carbon investment (Swirski, 2015).

The information above is closely related to the issue of the coal-free power stations and to the case presented in this report. As stated by Mr Glos, former CEO and Manager of the thermal power plant, one of the main reasons to look for the coal-free heat generator were increasing prices of the CO₂ emission allowances, present as well as future. Incinerators are not recognized as renewable sources; yet they do not require CO₂ permission. Even though, policy

about renewable energy sources is still adjusted, waste incineration plants are not involved in a discussion (Grochowska, 2013).

In 2008 Professor Pajak from AGH Krakow² has studied waste incineration plants across EU, and compared to the amount to Poland. He compared the number of installations and this number across new EU members. Study determined that in 2008 Poland was in the last place regarding landfills of municipal waste. From the data gathered 92-93% of waste was sent to landfill and only few percent recycled or sent to recovery operation (Puls Biznesu, 2008). The amount of waste used in energy generation did not change significantly up until 2016 when only one major waste incineration plant was running. It is said that the basic reason for the turnover to build six large scale incinerators is to meet the requirements set in EU's Directive 1999/31/WE and waste landfill.

Another requirement set is the BAT principle – Best Available Technology based on the EU Directive 96/61. There are requirements regarding reduction of biodegradable waste. According to article 5.2 Directive 99/31/WE and article 16a act 4 of the amended Act on waste reduction that should be carried out in three stages defined as follows:

- Until 31 of December 2010 the amount of municipal waste directed to landfills are to be no more than 75% of the total weight in relation to the weight of the waste produced in 1995.,
- Until 31 of December 2013 the amount of municipal waste directed to landfills are to be no more than 50% of the total weight in relation to the weight of the waste produced in 1995.,
- Until 31 of December 2020 the amount of municipal waste directed to landfills are to be no more than 35% of the total weight in relation to the weight of the waste produced in 1995

If the stream of landfill biodegradable waste would not be adequately reduced, accordingly to set directives, Poland could be a subject of severe EU sanctions including financial restrictions. Also, polish law provides for penalties from 40-200 thousand PLN, which would be imposed on the body of waste flow (collection companies). However, it is municipalities' obligation to create the conditions for businesses to implement the directives in the field of waste management (Okranski, K., Czachor, K., 2012).

²Faculty of Mechanical Engineering and Robotics, Department of Power Systems and Equipment for Environmental Protection

Decreasing the number of landfills of biodegradable waste also decreases release of so-called landfill gas. Landfill gas is a mixture of gases. Its primary ingredient is methane in an amount of 40-65%. Methane is also a main element of natural gas, which indicated that landfill gas can be used as a fuel in boilers and gas engines. It is estimated that the proportion of methane in the formation of the greenhouse effect is very high, as the effect is about 20-times greater than the impact of a similar amount of carbon dioxide. Getting hold of landfill gas reduces the emission of methane into the atmosphere which reduces the greenhouse effect (Enricom, 2015).

1.4 Positive experiences with Waste Incineration across Europe

Waste Incineration plants are not a forbidden topic in Europe. In fact, these plants play a significant role in countries waste management and energy production. In 2004, EU-15 incinerated 43 million tonnes of municipal solid waste, providing electricity for 27 million inhabitants. In years 1990-2000, majority of EU countries decommissioned many small, inefficient and non-ecological waste incinerators, building instead big, innovative installations therefore a number of waste incinerators decreased but their overall efficiency increased (Krakowski Holding Komunalny, 2009).

In 2008, the amount of waste incinerated in Germany reached 19 million tonnes annually. Technology in Stassfurt allows reaching 80% of efficiency in energy recovery for heat and electricity. France has the biggest amount of waste incinerators in Europe, and heat from energy recovery in Paris equals 53%. Sweden's waste management is based on the rule "maximum recycling and energy recovery, minimum landfills". Emission norms in Sweden in thermal waste utilizations are ten-times more restrict than EU (Krakowski Holding Komunalny, 2009).

Denmark plays a significant part of positive experiences from across Europe, where 80% of waste is incinerated. Whole country incinerates the largest amount of waste per inhabitant in the world. All of the waste incinerators are equipped with heat recovery (Krakowski Holding Komunalny, 2009). In contrast with Sweden, Denmark's policy shows motto "more waste is good, less waste is bad" (Zero Waste Europe, 2014). This slogan was valid until Danish Environmental Protection Agency noted that Denmark is one of the countries in Europe producing most waste per inhabitant. In 2010 household in Denmark produced 447 kg of waste per person, which is 8 kg of waste thrown away per person every week (Ministry of Environment and Food of Denmark, 2016).

1.5 Waste Incineration plants in Poland

Until 2015, in Poland there was only one running waste incineration plant which is located in Warsaw. Annually, it is producing 10,5 GWh of electricity and 240 TJ of heat from 40 000 tonnes of waste. However, up to the end of 2016 six new waste incineration plants are to be built and in use. Plants in Krakow, Poznan, Bydgoszcz, Szczecin, Konin, Bialystok, will contribute only partially in Poland's environmental and energy politics. These six waste incinerators altogether will produce approximately 527 000 MWh of electricity and 3,01 PJ of heat which is only 0,4% of annual total electricity demand, and 1,2% of annual total heat demand from 2013 (IEA, 2016). All these seven (including one in Warsaw) plants will utilise over 1 million of tonnes of municipal waste from around Poland. Waste incineration plant in Krakow will produce heat and electricity mainly to power public transport (Puls Biznesu, 2015). The amount of waste generated per capita (indicator unit of production) is highly dependent on economic and social factors, of which the main are: the standard of living of the population and the size and intensity of consumption of products (Ministry of Environmental Protection, 2010).

In 2013, over 8 million tonnes of mixed municipal solid waste (MSW) was collected in Poland. This includes waste from households, commerce, small businesses, offices, institutions and municipal services. Also, in the same year, over 1 million tonnes of municipal waste was collected separately. The materials include: paper and cardboard, glass, plastics, metals, textile, hazardous materials, waste electrical and electronic equipment, bulky waste, biodegradable and composite packaging. Overall, the average municipal waste collected and generated in kg per inhabitant in 2013 is 246 and 314, respectively. That is 68 kg of waste is misplaced, most probably burned in individual house burners, outside houses in courtyard or placed in the uncontrolled manner in the wild (GUS, 2013).

The overall operational number of controlled landfills in 2013 was 431 with a total area of 1944,3 ha. The significant majority (318 and 1272,3 ha) of these are located in the countryside. There are 363 sites in total with degassing installation, but only 74 are with energy recovery the number of gas installations can have a bigger number, as there might be more installations than sites (GUS, 2013).

The total of the municipal waste collected in 2013 is over 8 million tonnes. According to Clifford Chance, international law and consulting firm, Poland produces approximately 12 million tonnes of municipal waste every year. However this is a very different number from the collected MSW. If Poland would comply with EU standards, 2,5 million tonnes of waste would

be incinerated every year. However, that is no more than 30% of the collected MSW given above (Clifford Chance, 2013).

EU's waste management requirements oblige Poland to decrease the amount of landfills by 35%. Therefore in the coming years the amount of waste incineration plants and their importance will increase significantly. Their role will be to dispose of MSW and generate power. In Europe there are over 400 waste incineration power plants, which annually utilise approximately 25% of the produced MSW. The majority of the plants are located in France (129) and Germany (72) (Puls Biznesu, 2015).



Figure 5: Municipal Waste Treatment in 2013. Source: (EUROSTAT, 2013)

Figure 5 shows data of 2013. It shows that in Poland 63% of a municipal solid waste was sent to landfills; 29% of MSW was recycled and composed; and only 8% of all MSW was incinerated. This 8% looks really weak next to their western neighbours (EUROSTAT, 2013).

1.6 Research Question

Addressing the above issues and Poland's poor performance on waste management involving utilisation with energy recovery, the research question for this report is:

Can waste incineration play a sustainable part of Poland's energy supply?

The answer to the question is an analysis of the issues based on a case study, presenting technological and economic matters, as well as social response. The study will provide the insight into smaller communities' reaction on waste incineration projects, their arguments against it and steps taken to halt the investment. This report will show the differences between the knowledge and lack of knowledge of the inhabitants, with subjects pointed out in the interviews, agreements and local press releases. The aspect of the importance of social sustainability will be studied.

The study will not involve in-depth analysis of behaviour of communities, as well as all possible aspect of social sustainability, as each project invested by firms has different approach and goals regarding sustainable development. However thorough behaviour analysis could present clearer answer to the outcomes of projects concerning social well-being, it requires deeper physiological study which author of the report does not have the knowledge or experience of.

Chapter 2: Waste-to-Energy and Sustainability

Referring to the Research Question, this chapter focuses on the objective if waste incinerators are part of sustainable development. A study is built on information across Europe, which gives an international perspective on the waste-fuelled energy recovery systems.

Sustainable development is a broad subject, which each company and organisation in every industry is interpreting it in their own way. These establishments' interpretations have in common basic definitions of sustainability and its components which will be explained further in the report. This chapter is intended to give an overview of these components which will be applied in the analysis of this report. It should be made clear, that the report will not contain sustainability assessment, therefore it will not be defined nor applied in this or further chapters.

2.1 Sustainability

To understand the concept of sustainability in waste incineration projects, a definition of sustainability and the three pillars of sustainability should be noted. In simple words, sustainable development is the possibility of continuing specific behaviour indefinitely (Thwink.org, 2013). According to another definition, sustainable development is to balance local and global efforts to meet the basic human needs, without damage or degradation of the environment (Kates, R., Parris, T. & Leiserowitz, A., 2005). These two definitions are not mutually exclusive and can be equally reinforcing. To better address sustainability, the concept is typically divided into three pillars (Figure 1): social sustainability, environmental sustainability and economic sustainability (Thwink.org, 2013). This division allows organisations to look for a balanced approach of social, environmental and economic factors (Frontstream, 2016). It is noted, that to reach true sustainability, the three pillars need to be in equal harmony (Circular Ecology, 2015).



Figure 1: Three pillars of Sustainability. Source: (Thwink.org, 2013)



Figure 2: Connection between economy, society and environment. Source: (Scott Cato, 2009)

The interconnection between the three pillars can be described differently; however, they all work for a positive sustainable development and outcomes in social development, economic development and environmental protection.



Figure 3: The three sectors of sustainable development. Source: (UTSC Sustainability Office, 2013)

Figure 3 presents three pillars of sustainability in a harmony, mentioned previously. It represents three equally important parts, each having their own goals to reach and subjects to maintain. Each part interlock with each other and create additional aims, such as social equity, healthy environment and sustainable economy, when these are combined the project reach the status of being sustainable.

Environmental Sustainability

One of the approaches (Figure 2) notes that the environmental sustainability is the most important. It involves whole ecosystem. One of the major drivers to increase the attention to environment is the human impact (past and present) and the destruction of natural resources (Clark, 2006). To mathematically express the impact towards the environment, in 1970s the I PAT formula was developed. The formula is designed to attempt the explanation of the human consumption in three components: population numbers, level of consumption (as affluence), and impact per unit of resource use (because the impact depends on technology used, therefore term "Technology" is used) (Ehrlich and Holden, 1974).

 $I = P \times A \times T$

Where: I = Environmental Impact,

P = Population

A = Affluence

T = Technology

To manage and sustain their environmental responsibilities towards the ecosystem, companies and organizations are provided with tools to manage adequate level of sustainability named as environmental management (ISO 14000, 2015), which involves the "organizational structure, planning and resources for developing, implementing and maintaining policy for environmental protection" (Sroufe, 2009). In the broadest understanding environmental management includes oceans, freshwater systems, land and atmosphere and it can be applied to any ecosystem from tropical forests to a home garden (NOAA, 2009). If the environmental issues are not solved, then no matter how hard society tries, the other pillars will not get stronger because they are dependent on a greater system, which is defined as environment (Thwink.org, 2013). Herman Daly, an ecological economist, once asked "What use has a sawmill without a forest?" (Daly, H. & J. Cobb, 1989). Looking at the sustainability from this perspective, economy is a subsystem of the society, which itself is a subsystem of a biosphere.

Economic Sustainability

In the 1970s economic sustainability was described as "equilibrium with basic ecological support systems" (Stivers, 1976). Also in 1987, a study published by the economist Edward Barbier, identified that goals of environmental preservation and economic growth are not conflicting, but also can support each other (Barbier, 1987). According to the United Nations, green economy should contribute to eliminating poverty in addition to sustaining economic growth, improving human welfare and creating employment while maintaining a healthy functioning ecosystem (United Nations, 2016).

Economic sustainability regarding waste incineration is based on similar principles which would support values stated above by United Nations. Such project needs to be assessed by tools able to prepare cost and benefit analysis, predict regression and design scenarios. These assessments are indications if a waste-to-energy project could be economically beneficial and play a valuable part in economic sustainability. However, the outcome and content depend on the local socio-economic environment (Stevens, 2016).

Social Sustainability

Sustainability is also a social challenge. As the equation did involve population, wealth and technology, the environmental impact is man-made. This challenge requires international and national laws and policies, urban planning and local and individual lifestyles (Fawcett *et al.*). Therefore as humanity shall protect environment, the social sustainability is defined as "humanity shall help humanity".

Social sustainability is the least defined and often least understood part of sustainable development. It could be expressed as level of social well-being for an indefinite period. That level should be looked at in relation to the goal of people, which is (or should be) to improve the quality of life for the living and future generations. However, it is a topic of the universal disagreement, of what quality of life goals should be. The disagreement is between nations, religions, political parties and cultures (Thwink.org, 2014).



Figure 4: Four Pre-eminent Concepts of the Social Sustainability. Source (Murphy, 2012)

In an article by Kevin Murphy (2012) the author suggests the four pre-eminent policy concepts (Figure 5) which present basic human desires, necessary for a project to be successful (Murphy, 2012). These four are crucial parts, as development is to be people-centred and endorse rights, opportunities, choices and dignity (Clark, 2012). It is in the human nature that people are working toward maintaining life or creating better future. Social sustainable development promote awareness for sustainability and working together, which with other two pillars can expand at much greater lengths.

The reason for the above statement is to give the brief clarification for the social behaviour towards technologies, and what results in not following even the basic social steps in sustainable development. How disturbed equity, awareness, participation and social cohesion can lead to the failed project, even in a small-scale community.

2.2 Sustainable Energy and Waste Incineration

A simple definition of sustainable energy is an energy system which supply other's needs, without compromising the supply for future generations to meet their needs (Renewable Energy and Efficiency Partnership, 2004).

In defining sustainable energy, renewable energy plays massive role. Renewable energy systems are using natural and non-limited natural sources, without producing significant, longlasting negative consequences while doing so. Clear argument exists if the waste-to-energy incinerators are a part of renewable energy. The definition of renewable energy, stated by The European Commission's Renewable Energy Directive, only includes non-fossil fuel sources, which is "wind, solar, aerothermal, geothermal, hydrothermal and ocean energy, hydropower, biomass (excluding in waste), landfill gas, sewage treatment plant gas and biogases" (The European Commission, 2009). Therefore, according to the above statement, waste burners, even with the much improved filtering system and monitoring of the extracted gases, is not named as a renewable energy. Also, the British Department for Environmental Food and Rural Affairs document states: "Energy from residual waste is only partially renewable due to the presence of fossil based carbon in the waste, and only the energy contribution from the biogenic portion is counted towards renewable energy targets (and only this element is eligible for renewable financial incentives) (DEFRA, 2014). Mixture of waste in the residential bins might contain fossil derived materials, such as plastics, they also might contain paper, card and food waste which are biogenic materials (Brown, 2014).

Nevertheless, as waste incinerators with energy recovery are not first choice sustainable solution, it is a part of a sustainable waste management. The Figure 5 below presents the waste hierarchy. B, C, and D are recovery operations. Defined by the European Commission, 'recovery' means "any operation the principal result of which is waste, serving a useful purpose by replacing other materials which would otherwise have been used to fulfil a particular function, or waste being prepared to fulfil that function, in the plant or in the wider economy" (The European Commission, 2008). On the international level, the most realistic scenario is to recycle. Some countries which implemented landfill ban had risen the percentage for recycle, as communities are clearly directed what shall be done with waste. Figure 5 in the introduction shows European countries with implemented landfill ban, which show clear 1% or 3% of landfill; however they do not have their recycling rate much higher than countries without the ban, like Slovenia or Ireland (Yalakom, 2015). The difference between these is the investment in the energy-recovery waste incinerators.





Data collected by Confederation of European Waste-to-Energy Plants (CEWEP) in 2015 gives information at which stage of landfill taxes and bans a given European country is. In the contrary of the Figure 5 where Belgium is shown that is does have 1% of landfill, it is now stated that is landfill free. Germany, which has the highest rate of recycling, has implemented a landfill ban for untreated MSW since June 2005. There are also countries mentioned that do not have implemented landfill ban, and do not have such plan (Bulgaria and Portugal) (CEWEP, 2015). Poland has implemented ban, since 1st of January 2013 on biodegradable waste collected separately (Leal Filho, W., Kovaleva, M., 2015). It seems as Poland has started well, since one of the European Commission's top propositions is to rise the importance of the recycling by enforcing a ban on landfill for separately collected waste by 2030 (Simon, 2016). That is, in case of Poland, additional separately collected waste of other recyclables such as

plastics, metals, glass and paper. The above are only examples of a positive environmental, as well as economical outcome.

Another interesting topic of the economic sustainability is fee for CO_2 emitted in Waste-to-Energy plants. Because these plants are not officially recognised as fossil-fuel based, there is no fees. According to Directive 2003/87/WE installations to incinerate municipal solid waste are excluded from EU ETS charges (The European Commission, 2003). There is clear contract between waste incineration with energy recovery and fossil-fuel plants in investment costs, as waste incineration are built from different material, more expensive than conventional fossilfuel burners, but the latter are not approved for subsides, as the former do. In case of fuel prices, waste incinerators do not pay for collection, just for preparation and transport, while conventional plants do pay for fuel (Own source, 2016a). These are comparable prices, excluding the above explained CO_2 fees.

The above definitions and explanation will create a base for the analysis in this report. The 4 pre-eminent concepts of Social sustainability will be a foundation to the study of the cases and the analysis of the social involvement in the projects.

Chapter 3: Methodology

The purpose of this chapter is to define and study methods which are to be used in this report. Since more than one of the data gathering methods are applied, each will be described, the purpose method explained, and how is it used to collect data for the report.

3.1 Qualitative Data

Data used in this report is mainly based on the qualitative data. Qualitative data is a broad methodological approach largely used in social sciences. This methods study the *why* and *how* of decision making. As this type of data can be extremely varied in nature, for the purpose of this report two of the major categories will be used: Written Documents and In-Depth Interviews (William, 2006). The analysis of this report also uses conceptual qualitative data. It is described as data related to understanding of human behaviour and motives from the informant's viewpoint. Main methods to gather the above type of data is through observation and interview (McLeod, 2008).

As it is the case when people study people, researchers do have attitudes and opinions on the subject as well, and it is also more honest to acknowledge their values, which can play a part of a framework of the research. The good example of such research method is an unstructured in-depth interview, when researchers can gain data through the use of open questions. Answers to this kind of questions allow the researcher to develop real sense of the situation (McLeod, 2008).

Document Analysis

Document analysis is a procedure of examining and evaluating documents, both printed and electronic. These documents contain text and images that have been chronicled without researcher's intervention (Bowen, 2003). This analysis is often used with other qualitative research methods as means of 'triangulation'. It is the "combination of methodologies in the study of the same phenomenon" (Denzi, 1970). By using at least two sources, researchers are seeking validation of the study. Triangulation helps researcher avoid the fault that the study is an outcome of a single method, source or investigator's bias (Patton, 1990). This research method is predominantly applicable to qualitative studies, creating rich description of a single issue, event or organisation (Bowen, 2003).

The use of the documents is to provide context of the research. They provide the scenario of the case in order from the initial proposal of the investment through the Environmental Impact Assessment to building permission. With this information, the background is set, for the social impact on the project, which is also commented in another method used in the report, indepth interview.

In his study, Bowen (2003) lists advantages and restrains regarding documents analysis in the research.

Advantages:

- It is an *efficient method*, as it is not time-consuming. "It requires data selection, instead of data collection"
- Numerous documents are publicly *available*, therefore it is easily obtainable, especially in the era of internet
- It is noted that documents analysis is *less costly* than other research methods, it saves the effort in collecting the data
- Documents are *inconspicuous,* and is unaffected by the research process
- As the documents are non-reactive (unaffected), documents are *stable* source of data
- It provides with precise names, dates and fact, which makes them *exact*
- They *cover* a significant span of time as well as events and settings

Disadvantages:

- Documents were written for different purpose therefore it might *not cover the sufficient amount of detail.*
- As the access to documents can be blocked, it makes them not retrievable
- These documents are chosen by a researcher therefore it can provide biased selectivity, as the selection might be incomplete (Bowen, 2003).

Interviews

For the needs of this report, Face-to-Face (FtF) interview is used, either formal or informal. FtF interview is the only type of interview that has synchronous communication in time and place. That means that the questions and answers are done at the same time, or with very short amount of time in-between, and place as the interviewer and interviewee are present in the same location/room. In contrast, telephone interview is characterised by synchronous communication in time, but asynchronous in place, which means that the time between asked

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question and given answer is similar to FtF interview, however, they are not in the same location, room. The advantage of the synchronous communication is that the answers are more spontaneous, without extended reflection. FtF interviews, as no other interview can provide a number of the social signals. These signals, such as voice, intonation, body language, can give a researcher a lot of extra information which can be then added to the verbal answer of the interviewee (Opdenakker, 2006).

The type of interview used is an unstructured interview. The main difference between unstructured interview and two other interview types is that it involves one main question and will be conducted as a story with occasional questions asked for an explanation of a term, or person. This type of interview is difficult to manage (Gill *et al.*, 2008) and in this report it is used as gaining different perspective on the subject area presented in the documents. This type of interview is picked, rather than structured and semi structured interviews as unstructured interview is often a consequence of gathering in-depth information about the subject. In-depth interviews are used to reconstruct experiences and events related to the topic. The basic research question provides a start and sets the theme of the interview, but between certain amount of information, questions are developed to investigate the specific aspect in more detail (DiCicco-Bloom and Crabtree, 2006).

Structured interview has usually little room deviation in responses, contrasting approach of unstructured interview, when the questions are asked depending on the previous given answers. It is less time-consuming, as questions are prepared beforehand, and the length of the interview then depends on the answers given by interviewee. Structured questionnaires are good choice if the topic is well focused, and the researcher knows exactly what is needed to be achieved. In comparison, unstructured interview could take a shape of a background story for the topic, and sometimes only personal views on the subject (Cohen D, 2006). As middle ground, semi-structured interviews gives the researcher a freedom of adjusting previously prepared set of questions, which might include asking follow up questions or omitting some of the prepared ones. The format of an interview is very flexible (Darrin, 2015).

3.2 Data gathered for the report

In case of this report, document analysis methods is widely used, providing technical, environmental and economic information regarding the main case study, examined in the analysis. These documents are printed files, granted by the interviewee to support this report's objectives. Social analysis is however based on the various electronic articles, opinions and interviews. These documents, together with interviews (both formal and informal), and researcher's values create the data, which set the framework of the analysis for this report.

Examples of the printed documents provided for the study are:

- Decisions of Regional Director of Environmental Protection in Warsaw and States District Sanitary Inspector in Nowy Dwor Mazowiecki
- Letter from the investor to the town hall presenting the technology as an initial idea
- Expected Economic Effects provided by ZEC
- Environmental Impact Assessment by investor
- Press releases related to the particular project

As an addition to the analysis of the above mentioned documents, an unstructured in-depth interview is conducted with M.Eng. Roman Glos, former CEO of the Zaklad Energetyki Cieplnej (ZEC) (Eng. Thermal Energy Plant), and current manager of the above thermal power plant.

The purpose of an interview is to "gather descriptions of the life-world of the interviewee with respect to interpretation of the meaning of the described phenomena" (Kvale, 1983). The interviewer and author of the report expect to gather personal information and view on the matter of the unsuccessful waste incineration project. It is believed that qualitative methods such as interviews provide deeper understanding on the phenomena, than quantitative methods such as questionnaires (Gill *et al.*, 2008).

The purpose of the interview was known, thus Mr Glos directly started explaining the aims of the topic. It began with the description of the original thermal power plant, and follow through to the planned project. Additional questions were asked, such as "Do you think building waste incinerator is a good idea? ", and "Did the Mayor received all the documents?" The primary question is prepared accordingly to the status of the interviewee, accordingly to the possible amount and depth of the shared information.

This method is useful to get a story behind the issue, as it intends to follow-up missing information on the matter. This Face-to-Face interview is conducted to gather the qualitative

information about the situation of the recently invested waste incineration system, which was to be built as an addition to the ZEC plant.

Second of the interviews quoted in the report is a secondary sourced structured interview, with Professor Pajak from AGH Krakow. With the amount of various studies about waste incineration plants, gathered data and public opinions, author of the report used his opinions to support, answer or argue other views.

3.3 Approach to Analysis

In the analysis, the motives behind the actions of community will be explained, as well as the cases analysed based on the 4 concepts of social sustainability. These two independent analyses will be supported by the experts view on the subject of waste incineration, and a local's view of what has happened in a particular subject of waste incineration. The latter also leads to possible way of presenting the new and somehow still controversial technology which would ease the distrust.

Why people act the way they do?

As the report is built on the analysis of the social sustainability and communities' response to the projects, basic behavioural analysis is applied, as to understand why people act the way they do. What actions they took, and why. As Professor Winter states " social emotions such as anger, empathy, envy and shame shape strategic interactions, as they not only influence the behaviour of those who experience them, but also of those who interact with them". This ruthless approach is more likely to provoke the cooperation than rational attitude (Winter, 2015). It can be imagined that each affected member of the community, inhabitant of the town begins to attach personal and private meaning to the event. Each member applies a personal meaning to all that happens to him/her within their sight and hearing, based on their interpretation (Anderson, 2012).

The author of this paper believes that people affected by the new project are more likely to be influenced by the frustrated community, which are in similar situation to them than experts on the subject, who might not be even present at all when the scheme is presented. In the analysis of this paper, author presents number of possible reasons that would explain the urge for the community to be distrustful and suspicious of the new technology and approaches.

Chapter 4: Analysis

This chapter intends to define and analyse the motives behind certain characteristics of Polish community and their actions against waste incineration project. First independent analysis is based on historical development of the character and certain traits that resulted in distrust and opposition towards new or foreign investment. These traits are then further involved in the actions towards described cases. Analysis of the actions taken against waste incineration plants is based on the four pre-eminent concepts of social sustainability described in Sustainability chapter. The concept of equity, awareness, participation and social cohesion is another independent analysis.

Following the possible justification of the actions towards cases, a secondary sourced interview is found to contradict the reasons of distrust with the study facts of the waste incineration projects. Lastly, a past event will be described real-life situation by the informal interviewee. The portrayal of the situation will give another reason for community not to rely on the waste incineration technology.

The reason for this chapter is to fulfil all the aspects of sustainability if the projects of waste incineration in Poland are to play a sustainable part in Poland's energy mix.

4.1 Brief history of Poland

Poland has a very traumatic past. After 800 years of being an independent kingdom, in 1795, Poland was wiped out of the map. It was absorbed by three neighbouring power, the Prussian, Russian and Austro-Hungarian empires. An independent country did not exist for 123 years, and then with a start of World War I it regains its status of the II Republic of Poland (Groniowski, K. Skowronek, J., 1977). This status lasted until 1939, the beginning of World War II. Due to the location of Poland, a historian Timothy Snyder has called Poland "bloodlands" of Europe (Orenstein, 2014). In September 1939 polish lands were taken by Third Reich and USSR. After a war the rules in Poland were dominated by communists (Eckert, 1990). Only in 1989 parliamentary elections initiated the process of democratization and economic reforms that enabled III Republic of Poland accession to NATO (1999) and then to European Union (2004).

After 20 years, Poland is now a sixth-largest economy in Europe (Orenstein, 2014). According to EUROSTAT, in 2011 Poland was one of the fastest growing economies in Europe. While the average GDP across Europe was only 1.5%, Polish economy grew by 4.3% (PAlilZ, 2012).

Having this history with western neighbours and by joining EU, Poland still is in close alliance with Germany. And this fact awakes mixed feeling in people in Poland. There is no clear pattern of ages or inhabitants of certain locations, but Poles do truly dislike when someone refer Poland as Eastern Country, and insist on calling in Central Europe (Orenstein, 2014).

The above information leads to the developed a distrust and unwillingness focused on the assistance and possibilities in investment given by the foreign countries.

Foreign investment

It is true that Poland is advertising itself to invest. However persons, like Mr Glos³, remembers when in the 90s Poland (as community) had great ideas of their own, when Poles were investing in themselves, regrets that the advertisements are being send to West (Own source, 2016a).

Today, there is no doubt that the polish economy including energy sector, in order to develop fast, needs foreign investment. However, the economist Heiner Flassbeck states "In political circles, and sometimes even among economists dominates the naïve belief that foreign investment is a game in which both sides win. Unfortunately, the reality is much more complicated (Wos, 2013).

As Flassbeck explained in the article, for a country with a lower level of development enters a new investment of foreign capital which for a start brings already much better technology, and thus the productivity much higher than hosting country can provide. This complements with a still cheap labour force of the country, and becomes a player that cannot be beaten. To challenge such a rival most of the local competitors are helpless. Also, most of them are used for the so-called transfer prices. That is preferential accounting treatment of costs between companies spread throughout the world which are daughters of one global company. Such transfer prices have a decisive impact on the competitiveness of the international group to other companies operating locally. Sometimes the foreign company using their commitment avoids local tax authorities. In practice, therefore, large Western corporations do not usually have any problems, to quickly gain a dominant position in the most rewarding markets for countries with weaker economic potential (Wos, 2013).

Having that in mind, it is easier to find the amount of money the foreign investor predestined for the projects or how many jobs it created. It is more difficult however, to present reliable

³ CEO and the Manager of the Thermal Power Plant in Nowy Dwor Mazowiecki

data about the lost business opportunities of local companies related to the emergence of a powerful foreign competitor. Such example is the privatisation of plant producing paper and cellulose in Kwidzyn in 1990 by the American company International Paper. The investments cost was \$150 million. However the value associated with the transaction lost tax profits reach approximately \$142 million. This was the effect of raising the price of paper by an investor after buying the company (Sobczyk, M. Okraska R., 2009). This is what Mr Glos with statement above was supporting: the lost opportunities and money by selling major firms.

In spite of the visible affection towards the Western opportunities, Poland is a very patriotic country, due to the history briefly presented at the beginning of the chapter. Therefore the mixed feeling is present. The nation that grew up and tried to make a decent living during and after communism did create a certain flow of characteristics and opinions. Some of them are particularly stubborn and invariable views, and some the opposite. The main matter is that the issue in subject must play an advantageous role for them. The matters include jobs, money, standard of living, their health. As in every other country, people are less and more ambitious. Also, in understanding of polish nation, private investments play the same role as foreign investments. Jealousy is a created trait of the nation's character due to the history, especially during communism and years after. It still is visible today, however young adults that rise with the investment ideas try to help each other, contrasting the features of communities of elderly.

These examples and explanations should make the understanding of these mixed feelings easier. There are people who see only positive traits of private and foreign investments, due to possible better work conditions, better connection with management, better wages. Regarding the latter, Poles starting to realize that company which was invested by foreigners is just a job, and Poland still does earn one of the lowest hourly rates which are on average &8.4, while across Europe average is &24.6 (Badowski, 2015).

4.2 Investing in waste incineration in Poland

The above case of lost opportunities, although some are related to different technologies and enterprises, gives an introduction towards the public opinion of the investors in Poland. This section will contain one detailed case, and several smaller cases of the waste incinerators project that were rejected by the community.

Waste Incineration plant in Nowy Dwor Mazowiecki

Data, definition and explanations of this case are a primary source which has been given as a generous addition to this report by Mr Roman Glos.

Primary Source: Interview with Mr Roman Glos

Could you tell me about how the project of waste incineration plant in Nowy Dwor Mazowiecki failed? What were the reasons? Could you briefly describe the technology and the plant?

"ZEC is producing heat for space heating and hot water as well as heat to use in the production processes (technological heat). The thermal plant in subject is producing heat in the range of 45MW, where 32MW is Space Heat, 5,5 MW Hot Water and the remaining part is technological heat for production.

New addition is influenced by the requirements of looking for substitute sources which would decrease the CO₂ emission. At the moment coal which is the current fuel for the plant and is used at approximately 22GJ/tonne. As a Board we had plans to not use coal for hot water and technological heat, but use alternatives. There was an idea to invest in gas-fired CHP system, however this somehow collapsed and idea of thermal plant fuelled by alternative fuel came through. Alternative Fuel, simply explained is a segregated and shredded part of combustible waste.

Firm of Ekokogeneracja S.A came with the idea of building additional boiler to the already existing system, fired by alternative fuel. It is because we do have the existing distribution network. Heat prices which would be based on this technology would be lower than prices for heat fired by coal. We would not be charged by investment or fuel. These are quite visible effects of such energy source. Of course source was to be utterly emission-free, and well developed machines were to protect atmosphere against all the harmful gases.

Personally I think that the technology was quite interesting. Also the economic effect for both firms was looking well. I can say that we sell heat energy annually at about 10 million PLN. Here saving for inhabitants are calculated to be around 500 000 PLN annually.

Overall the addition to the existing power plant was to be around 400 m². In RIPOK (eng: Regional Installation for Processing Municipalities Waste), already segregated waste was to be stored and transported in sealed containers. There was supposed to be no loose waste at the

ZEC site. From the containers, waste was supposed to go straight to the burners. Then it was designed to go to double emission clearance, with current monitoring system. The idea was also to create tables and monitors with emission values to present it for community. Reason for idea for those tables was to gain people trust about technology which is not familiar.

But the plan turned to be unsuccessful.

Although, everything was approved, all necessary agreements signed as well as building permission given which gave a clear beginning to the project, then some group of opponents, literally few people, started to strike that someone is building in the area of ZEC waste burning facility, which will contaminate the air.

The unfairness towards the investment was that the Mayor got afraid and changed his mind. He pretended that he does not have all the information; he thought something else is going to be burned. Now the town is threatened to pay 13 million PLN, since this is how much whole investment would have cost, without any mortgages. Ekokogeneracja S.A filed a lawsuit to halt the work by the city, since all the agreements were obtained between the investor and the city. However Mayor turned the process around and decided it was ZEC's idea, and someone needs to be affected. As Mayor stated, because I was the initiator of the idea, I cannot be the CEO of the ZEC. I lost mentioned position, however I was also Manager of the thermal plant. I retained this position, but without provision of work, which include any side agreements and main contract.

The installation was supposed to be launched at the end of this year (2016). And if that would not be met, the investor could incur expenditures and we (ZEC) would not be charged for anything. Nowhere in the contract on purchase of heat from the installation was a mention of investment costs that at some point would have to be returned. But it was a contract for the lease of the plot. As the city decided to break the lease for the plot, the investor now submitted their statement of claim on the basis of "if you throw us out, we would like a refund".

I think that it was a foolish behaviour of the Mayor that he immediately changed his mind. Talks and presentations should be organised earlier rather than later. In approximately the same time elections were organised, and the city was obliged to inform community on such project, especially that the environmental permit was handled for about 5 months, but maybe they did not organise the meetings with the locals to describe and explain the technology. I personally nor personnel of ZEC was involved in the gathering of any of the documents, nor organization of permissions or meetings.

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I could publish articles and information about new installation in external newspapers, such as Gazeta Prawna (Eng. Law Magazine) where it was usual subject to be published about. However, in our local press, the negative approach was taken as it was a time of elections and the editors did not see the need of publishing about new installation of waste incineration plant.

Now the city is forced to pay compensation, and then take the mortgage as the new waste incineration would have to be built because of the recent European requirements.

Primarily, the Mayor issued in the name of the city environmental decision. Environmental Law is in general the basis for any sort of investment to build. When the environmental decision is released and it is final, only then the permission to build with the following documentation is given and the installation can be built. The investor (Ekokogeneracja) received all the documents, which were to be signed by the city, which is either the Mayor or Mayors' representative with his permission. Environmental agreement is signed 'with authorisation by the Mayor'. However, the Mayor denies any permission given or signing the documents.

As a CEO I had all the documents needed: the resolution of the Supervisory Board; the Board had presentation and it agreed to authorize the Management to sign a preliminary contract for the reception of heat. The whole process was formally settled. But we were only to mention purchase the heat and not to build the plant.

The final word from me is that the Mayor should have permission of community when signing an environmental decision, but the meetings were not organised. It was modestly published in newspapers, leaflets, etc., but there were no meetings."

Document Analysis

In the decision of building and commissioning waste incineration plant, there are necessary issues to be fulfilled. A new waste incineration plant is one of the enterprises that might significantly affect the environment. According to Art 2, policy 1 point 46 – installations for the recovery or disposal of non-hazardous waste by using thermal or chemical processes, including installations for cracking waste, excluding plants incinerating waste being biomass within the meaning of the regulations on emission standards from installations, it will be necessary to carry out **Environmental Impact Assessment** of the planned project (Appendix 1) (*GK.6220.14.4.2014*, 2014).

This document is then revised by the Regional Director of Environmental Protection from Warsaw, and State District Sanitary Inspector from Nowy Dwor Mazowiecki. In short, the issues raised by the Regional Director of Environmental Protection are to be solved or followed. Also this document brings to the attention matters that are most often mentioned in the discussion with communities concerned about new project.

According to Environmental Law, waste incineration requires an emission license, possibly including integrated permit. Management responsibilities bear requirement to comply with emission standards, to conduct emission measurement and report results of these measurements to the competent authorities. As stated in Art. 66 of Environmental Law policy, assessment should include a detailed analysis of:

- Interactions of the planned project on the atmospheric air include: calculation of the spread of substances in the air, for which the permissible levels has been set, as well and a baseline (including all emitted substances, and all emission sources). Calculations should be done according to the methodology set by the Minister of Environment and adjusted to it software. It is required to present a clear graphic interpretation of the results, allowing an unambiguous statement of the emission level in the atmosphere and attach a list of the current state of the quality of the air for the analysed area, input data used in the calculation and printed calculations;
- Noise protection: Perform analysis of the emission of noise to the environment in accordance with the methodology recommended by the Minister of Environment, and therefore the use of instructions in accordance with Polish standards and adapted to them calculation program and introduce issues in graphic form, showing the reach of individual equal-loudness contour during the day and night and pointing to areas protected acoustically;
- issues related to water and wastewater management: the EIA report should contain information about the expected quantities and procedures of domestic waste water, rainfall water sources and roofs and paved areas (roads, parking lots);
- issues related to waste management: the EIA report should contain information on the types, codes, and the expected amount of waste generated at various stages: implementation, operation and decommissioning of the enterprise and the place of formation of waste, ways of their storage and further utilization of the waste;
- and possible social conflicts associated with the planned project (*GK.6220.14.5.2014*, 2014)

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The above issues relate in the large extend to environmental sustainability, which as stated previously is definitely a significant part of the sustainable development. Last point mentions any other possible social conflicts, which link to the concerns raised in social sustainability.

One of the locations that community expressed their concern about, in the matter of environmental protection is the area of the European Ecological Network Natura 2000–Ostoja Nowodworska PLH140043 which boundaries are located in approximately 180m to the south of the project area. However, giving a scope and location of the planned project, the EIA states that the implementation and operation of the planned investment will not significantly adversely affect the elements of the natural environment, including the need to protect the integrity of the area Natura 2000 (Regional Director of Environmental Protection, 2014). Natura 2000 is an 18% of land across EU and almost 6% of marine territory, which contribute to the largest coordinated network of protected areas in the world. It creates home to Europe's most treasured and threatened species and habitats (The European Commission, 2016).

Users of the heat distribution network were provided with a sheet of **economic benefits**. Expected economic effects involve the construction and purchase of thermal energy from the boiler room fuelled by alternative fuels for ZEC Sp. Z.o.o. in Nowy Dwor Mazowiecki

- 1. The investment costs 0.00 PLN entirely borne by the investor "Ekokogeneracja" S.A.
- 2. Net purchase of thermal energy for heating system -
 - A) Current cost of production of thermal energy from coal by ZEC 38,80 PLN / GJ
 - B) The proposed purchase price of 35 PLN / GJ
 - C) Expected purchase quantity of 65 000 GJ / year

65000 GJ x (38,80 – 35,00 PLN) = 247 000 PLN/year

- Savings resulting from not buying permission to CO₂ emissions for 1 tonne of coal power = 2 tonnes "of" permission:
 - A) Purchased fuel heat value of 22 GJ / t
 - B) Efficiency of heat production 80%
 - C) Reduction of the purchase amount of fuel -

65 000 GJ / (22 GJ / t x 0.8) = 3693,18 tonnes of fuel

- D) Not purchased Permission CO₂ 3693 t x 2 = 7 386 t
- E) The costs for the purchase of CO_2 at a price of 6.5 Euro / t

6.5 x 4.2 = 27.30 PLN/t cost savings 7386 t x 27.30 PLN / t = 201 637, 80 PLN / year

Expected annual result for ZEC Sp. Z o.o. This savings in costs:

247 000 PLN + 201 600 PLN = 450 000 PLN / year (GK.6220.14.4.2014, 2014)

Referring the above data to the main research question of waste incineration being a sustainable solution, in this case economic benefits are clear. The overall benefits concern mostly costs of investment and saving associated with not paying CO_2 fees. According to current currency exchange of 1 Euro = 4.43 PLN, The annual savings are approximately 102 000 Euro.

The disadvantage or neutral position in the economic perspective in the project is regarding employment, as the newly installed system would be run by already employed personnel in ZEC (Own source, 2016a).

Other Cases

Hrubieszow Residents Protest (2016): This protest has been raised by inhabitants of Hrubieszow near eastern boarder of Poland. Communities presented issues that bother them, which have not been responded. The issues involve building new waste incinerator. The project was to be built on Gorecka Street, where the kindergarten is located, as well as a cluster of apartment buildings, private houses and social housing. One of the worries is focused on the location of the incinerator which is between the Sewage Treatment Plant and the landfill which, according to the community, will result in a higher rate of toxic gases and heavy metals, which will be directly spread to the whole city.

It is said that people living on the designated street already experience difficulties associated with the neighbouring landfill. Community presented practical problems of the investment such as traffic on the street and heavy trucks that would pass each day. They also mention damages connected with the transport as trucks will damage the already damaged road surface, which after the last construction of the ring road, has not been repaired yet. Inhabitants' complaint about constant garbage on the street as they are lost by trucks which carry containers, and are making already present holes worse, which hindering the normal driving. Especially where the sewage system was undergoing big reconstruction and the road was not properly repaired. The street is neglected and dirty. The complaint also included the stench from sewage treatment plant. This is unjust especially when managing people many times assured locals that after modernization of the plant there will be no odours.

Questions such as "who will compensate for the repairing our homes and apartments?; After all, who we will return reduced value of buildings, houses, plots of land and housing?" were asked after examining the facades on individual dwelling as well as blocks of flats. "Who finally wants to live in the vicinity of sewage, landfill, incineration, and the ring road?" It is proposed that the waste incineration plant should be located in such place where possible pollution (emissions, smell, and noise) could not travel to the city, where heavy trucks could move freely on the street / ring road, which is not inhabited by a large number of people. Locals argue that no-one asked them as inhabitants of the opinion when sewage treatment plants was built, noone asked about the landfill and in the end did not ask how the ring road built between the residential buildings.

The community asks for the extensive consultations with the public as the information presented at the meeting of local district Podgorze shows an evident lack of knowledge of the Mayor on detailed topics of this, somehow, very controversial investment (*Protest Mieszkancow Hrubieszowa*, 2016).

Nasielsk (2015): At the very beginning of the meeting with the community Bogdan Ruszkowski, the Mayor of Nasielsk, stated that the investment is not settled yet as he has not received an EIA report yet. He also said that everything is done according to the procedures, as the investor is trying to find a location for their investments in the area intended for industrial activity. Despite these explanations, the Mayor and the Town Hall personnel received a lot of blame for the lack of immediate information about this project, not only for locals, but also for councillors (Zycie Nasielska, 2015).

Krosno Protest (2014): Cases as above are present across Poland. One of them is community in Krosno in south Poland. The case includes inhabitants of the city being frustrated as the town authorities received subsidies from an enlargement of landfill and afterwards waste incineration utilising 28 000 tonnes of waste annually. The frustration comes from the fact that the inhabitants produces only approximately 9 000 tonnes of waste annually, and is a home of nearly 28 000 tonnes of waste imported from other cities, so that according to the agreement on subsidies from the EU, the installation will convert the planned 28 000 tonnes of waste. In the event of failing to do so, the city will be asked to return the grand (about 16 million PLN – including interest) (Residents Association of Krosno, 2014).

Large amount of waste is still missing despite lower fees on imported garbage from neighbouring municipalities - lower pay than people of Krosno. Here the locals ask questions of why the authorities of Krosno create such situation for the inhabitants. Spend taxpayers' money of approximately 15 million PLN for a massive pile of waste 1 kilometre from the market (Residents Association of Krosno, 2014).

4.3 Equity, awareness, participation and social cohesion

In the case of ZEC (2015), the majority of social concepts were disregarded. According to the Mr Roman Glos, CEO of the ZECs thermal plant, it was caused by the lack of attention of the Mayor of Nowy Dwor Mazowiecki. It is of course, very personal opinion, however order of documents and press releases followed by the author of the report, give the impression that Mr Glos is right. The information provided by Mr Glos is attached in the Appendix. The whole investment was developed between Town Hall and the Investor (Ekokogeneracja S.A., 2013). All documents were signed by the Mayor or in the name of Mayor. ZEC was involved in the project as it owns heat distribution network and possess a space needed to build a new system as an attachment to the main coal-fuelled boilers (Own source, 2016a).

Bypassing the information about the technology, economic data and emissions, the argument is very chaotic. Interpreting it with special regards to four social sustainability concepts, there is a lack of awareness of the need of such technology by the Mayor; lack of participation by the local community, which should be organised by Mayor or town representative, as it is a person responsible by informing inhabitants of the city of any upcoming projects in the town, also this issue presents lack of social cohesion, as community and town did not work together, the community was split in opinions (Novidvor, 2015); and lastly, fairness towards the ZEC, which according to documents, did not have a direct force nor decision towards the investment. The only contract that ZEC was the first contact with the Investor was to lease the land, which is the property of ZEC.

According to document⁴ published by the town hall, Mayor defined the project, settled conditions regarding realization and operation of the investment, however he did not imposed obligation to assess the impact on the environment. This could be interpreted as lack of attention to the, as previously named, controversial project such as waste incineration plant.

Also, the intriguing issue is that the whole argument was happening during times of voting. As experienced in bigger cities also international, such project as new power plant is a great

⁴GK.6220.14.18.2014

opportunity to show how the city could develop. Present great advantages, or the complete opposite (if that would be the case) and 'defend' residents from the unknown operations. However, the Mayor appeared to overlook the importance of the scale of the investment (Legio24, 2014).

It seems that the importance of the community associated with installation of a new thermal power plant has not been a priority of a Mayor as it should be. The consequences of an interruption of the building is fatal, as the locals throw away the opportunity of disposing increasing amount of waste in the controlled manner, economic saving stated above, and dismissing CEO of the ZEC thermal power plant, which was holding that position for over 20 years and manage to lift the establishment to many awards and proudly sponsor various projects such as expanding primary schools and culture houses. It appears as because of the Mayor's unawareness and lacks of attention towards the project, majority of social aspects were neglected.

It is clear that the environmental and economic data is in order, and it meets the requirements for the city to agree on the project, however in case of Hrubieszow (2016), one of the social sustainability concepts is negligent. Participation in this, so-called controversial project, is very low in the social perspective. The community complained about the matters that should be consulted. The Mayor that was chosen by the inhabitants of the town should have known more. One would think, that the lack of information about such project that was agreed between the investor and the city would be closely consulted with the locals especially that many disputes has been risen regarding establishments of similar theme.

4.4 Personal opinions and an expert's voice

The sad truth of the mentality against waste incineration is the unfortunate confidence that the neighbours' opinion is right instead of an expert study across the globe.

The following argument was given in the informal interview, with a woman, who lived in the countryside until her 40's, and who had used central heating system heated up by wood and coal-fired boiler for space and hot water, every day in the heating season. She does not feel negativity towards waste incineration plants, in fact, she think it is a good and logical solution. However, coming back to the social pessimism towards large scale waste burners; since 70's in Poland had been a wave of information and criticism of how bad burning waste in house furnaces is for environment. And this wave had been carried on for no less than 20 years; until recent years, when EU legislation was set to decrease the amount of landfills (Own source,

2016b). Since Poland produces 12 million tonnes of MSW every year, it became a real challenge. After years of persuading that burning waste has negative impact on environment communities, especially those who were never connected to the heat distribution network stopped burning wastes. They might have not understood the impact of air pollution, but the word was spread and they agreed.

These communities, similarly to the woman who described the case above, were in their 20's, 30's. Nowadays, when the idea of waste incinerators is taken forward, these people are in doubt, simply because for so many years' government and environmental activist were saying that burning waste is bad, and now it might be used to heat up whole networks.

Giving the years of encouraging people – majority of farmers and people with very limited education- to stop burning waste, and afterwards presenting it as a good and logical practice to burn it in large furnaces and retrieve energy from it, was simply conflicting the information they received. Also, the interviewee explained the time perspective while people are getting older. The perception that something happened 'not so long ago' might happen 10 or even 20 years ago. Truth to be said, once an older person is accustomed to the information or situation with age it is hard to change his/her view and way of doing.

The above argument is also supported in the interview with Dr. Eng. Tadeusz Pajak from AGH Krakow. One of the popular arguments spread across anti-waste incineration protests is the impossible to avoid poisoning and contamination by incinerators. Dr Pajak answers as this view is from the 70's or 80's. He encourages people to visit city centre of, for example Stockholm, Osaka, Vienna, Zurich, Munich, Paris, and many others, and ask the residents of these cities or those who work in these cities, if they feel threatened by the waste incinerators (Bezpieczna Energia z Odpadow, 2013).

The question of why Poles are so afraid of the waste incinerators provokes wondering why Poles are not worried about their health and the health of their children because of burning waste in their home furnaces. However following the development of the waste incineration in the larger cities in Poland, such as Krakow, Poznan, Bydgoszcz, residents can now travel and see what incinerators actually are. They see that plants were built there and people can live next to them. Another issue is, however, so-called NIMBY - not in my backyard, not under my window. With this phenomenon it is difficult to argue, but this discussion will always be carried on. Chimneys of designed incinerators will be under the permanent control of environmental services and the control of the citizens, since the work of these incinerators will be non-stop monitored and the results, including the concentration of emissions, will be available for the

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community. Emissions from the chimneys of modern incinerator in no way to be compared with domestic chimneys, through which go such great amounts of waste. The result is plunging into the clouds of exhaust, which is breathed for about five months a year perpetrators of these practices, their neighbours and small children. The exhaust gases contain incomparably greater loads of toxic pollution than modern incinerators controlled chimney.

Proposed Solution

To answer research question, waste incineration can play a sustainable role. Investors in Poland do lean in the direction of building new waste incineration plants as the technology to decrease harmful emissions is present, and the estimated economic benefits are clear. However, to fully consider project as sustainable, three pillars should be satisfied. As cases above introduced, social sustainability plays very important role. It cannot be stressed enough how important the participation of the communities are in the decision making of any sort of project that might change locals environment. As the technology might be great, and the emissions close to zero, it is the inhabitants that are affected by the factors, which the organizers cannot experience. Therefore, author of the report is proposing number of solutions they may present a project of waste incineration plant as a new, useful and interesting installation.

It is also useful to involve schools and even possible apprenticeships during the building of the installation. On average, young minds are more open to the new opportunities, approach toward success may start with the giving a number of lectures or presentations about the energy and technologies available. Presenting the countries data, and effects on the systems, could influence the view of the young community, which then can be carried home and influence their parents.

Also, large number of people learn and understand faster by seeing the technology live and seeing it work. It would be useful to spent time to prepare a simulation of the technology, present the way it work together with data to compare, so the persistent part of the community see clear differences between plants fired by the conventional sources and waste incineration installations.

An advice for the organizations, planners and investors is based on firmness. The requirement of the EU is regarded as a must-do objective. People react differently if the project is requested by the higher authorities. That leads to the presentation of the whole project. Referring to the scenario described above by the woman in her 40s, the organisers might reconsider the way they approach the community. Instead of striking locals with a new technology that is based on the actions that were forbidden a while ago, they (the organisers) should have presented the idea somehow reserved. It is proposed that instead of presenting first the idea of waste incineration, a new technology of producing energy should be praised. The data of emissions, technology and economic benefits shall be presented, and at the end the technology explained. It should involve all the background data, including the amount of waste produced and generated; as well as the disadvantages of having and additionally enlarging landfills involving gasses released. Although people are aware of the approximate investment prices of waste incineration plants, they also care about the environment and this is what the emphasis should be focused on.

The approach seems deceiving however none of the information is hidden from the community. It is only presented the way that local are not struck by the technology of burning waste, and then explained benefits, which they (the locals) might believe or not. The proposition is to show the advantages of the technology, and that they can be achieved by the process done in the waste incineration plant.

Chapter 5: Discussion

Next to understanding how social participation and acceptance is important, this report also shows that no project is perfect. However, it is important to choose 'less evil' for the planet. Giving the terrifying facts of waste polluting world's waters and land, emitting gasses which are in some extend worse than the CO₂, the option of having a technology which can get rid of the pollution under controlled manners, and additionally having an outcome of the energy, where in some places is still not enough, communities should feel fortunate to be offered best available technology of waste incineration.

The above protestors were emphasising on the effects of the emissions, traffic and possible noise, however they might have never thought that it is possible to adapt. Human can adapt to the factors they do not have an influence on such as temperatures, but also to the development of the environment.

To validate data used in this report, various documents and interviews were gathered and conducted. The cases presented in this report are rather recent and the documents provided are not widely analysed or published. In fact, the protests are often hidden, as the organisers and locals who are not a part of the protests are ashamed. When asked young people informally about the protest in Nowy Dwor Mazowiecki, young adults were embarrassed.

Waste incineration plants are relatively new subject in Poland in comparison with Western countries. Although studies have been made by polish scholars and policies involving waste management were comprised in the Environmental Law, it is still not as part of Renewable Energy systems. Starting planning and building waste incineration plants in large cities first is considered as a good approach, because as mentioned previously, communities in the smaller town will have opportunity to see that living in close area of the waste incinerator is not a disadvantage, but in fact a location like every other within a city.

As to reflection of the quality of the report, the analysis could be more behaviour and attitude analysis focused, yet the author of the report is not experienced in the in-depth psychological study.

The introduction could include more detailed cases of waste incineration plants from European countries, to support the statement against communities being frustrated by living near-by such installation. The documents regarding waste management in Poland did not clearly specify the policies for investments such as waste incineration plants. The Environmental Law

policies involving waste management did not specify waste incineration plants in great deal as way to utilize MSW.

Waste-to-Energy and Sustainability could include more of the technology explained, however knowing that the analysis will be based on the qualitative data and presenting various different types of alternative fuels and installations, would take time and space in the report, as the solution was not associated with neither.

Methodology include an adequate amount of methods used in the report, however the section with explanation of behaviour analysis and "Why people do what they do?" could be more detailed, as the analysis is mainly based on this section. It is however, multi-layered subject and the author attempted to select and include issues that might be involved in the analysis of the project.

The chapter of analysis is broke down into several parts. The author felt it is necessary to include brief history of Poland as an introduction of explanation towards main trait of distrust. Following case of foreign investment of International Paper is noted as an example. It is not further analysed but gives a good view on the lost opportunities and money by selling major firms.

As mentioned in the restriction for the research question, the author do not have an extended knowledge or experience in the behaviour analysis therefore this part of the analysis could regarded as not enough. Nevertheless, the author did found the analysis interesting and proposed solutions to bypass the unfortunate events that might happen in the future.

Finally author did not sensed the need for a great amount of figures, although they are clear way of showing the information, it is unnecessary for presenting qualitative data and solutions.

Overall, the report can give a beginning for the deeper societal study, as the issues did not lie in the matter of lack of technology or money; it did fail because of the unawareness of importance of social participation.

Chapter 6: Conclusion

Focusing on the energy security across country, with the constant increasing rate of municipal solid waste production, waste incineration plants with energy recovery is reasonable solution. It is important for projects which can affect the environmental protection, economic balance and social well-being, to analyse the project against the three sustainability pillars. However environmental and economic aspects are important, are also measurable and less problematic than social aspect, which is the least understood aspect of sustainability.

Measuring social satisfaction is difficult as it is a qualitative data, and every individual may have different view or perspective on the issue. Through the cases, the report presents analysis on the communities' attitude and treatment of their opinions regarding waste incineration projects. Data gathered by interviews, official documents and press releases, allowed author to publish a number of solutions, where communities take a significant part of the process of planning and building new waste incineration plant. Social sustainability has been analysed against four pre-eminent concepts proposed by Kevin Murphy (2012): equity, awareness for sustainability, participation, social cohesion. These being described and implemented in the cases presented in analysis chapter, gave the notion of unfairness.

As nobody knows best what well-being means for individuals, except themselves, the participation and understanding the project is a great step to satisfy a certain aspect of social sustainability. Also, as learnt from the main case studied in the report, the society needs to understand that the requirement set by the EU are not because the rulers of the countries across Europe wants to decrease the level of their comfort. These requirements are established to control and decrease the pollution that causes some of the environmental crisis.

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Appendix A

Documents below are letters addressed to Regional Director of Environmental Protection in Warsaw (GK.6220.14.8.2014) and States District Sanitary Inspector in Nowy Dwor Mazowiecki (GK.6220.14.9.2014). The main text is translated by the author:

"Based on paragraph 77, 1 point .1 of the Act of 3 October 2008 *on the provision of information about the environment and its protection, public participation in environmental protection and environmental impact assessment* (Dz U. No. 2013, item 1235), Mayor of Nowy Dwor Mazowiecki asks to agree on terms of the implementation of the project involving:

The construction of the boiler room to heat water"

Letters addressed to Regional Director of Environmental Protection in Warsaw (GK.6220.14.12.2014) and States District Sanitary Inspector in Nowy Dwor Mazowiecki (GK.6220.14.14.2014).

"Based on paragraph 77, 1 point .1 of the Act of 3 October 2008 on the provision of information about the environment and its protection, public participation in environmental protection and environmental impact assessment (Dz U. No. 2013, item 1235), Mayor of Nowy Dwor Mazowiecki asks to agree on terms of the implementation of the project involving:

The construction of the boiler room to heat water

after receiving Environmental Impact Assessment for the project."



URZĄD MIEJSKI W NOWYM DWORZE MAZOWIECKIM ul. Zakroczymska 30 05-100 Nowy Dwór Mazowiecki Tel. (22) 51-22-000, (22) 51-22-111 Fax (22) 51-22-101

> sekretariat@nowydwormaz.pl www.nowydwormaz.pl

GK.6220.14.8.2014

Nowy Dwór Mazowiecki, dnia 03.06.2014r.

Regionalny Dyrektor Ochrony Środowiska ul. Sienkiewicza 3 00-015 Warszawa

Na podstawie 77 ust. 1 pkt. 1 ustawy z 3 października 2008r. o udostępnianiu informacji o środowisku i jego ochronie, udziale społeczeństwa w ochronie środowiska oraz o ocenach oddziaływania na środowisko (Dz.U. nr 2013, poz. 1235) Burmistrz Miasta Nowy Dwór Mazowiecki zwraca się z prośbą o uzgodnienie warunków realizacji przedsięwzięcia polegającego na:

budowie kotłowni na ciepłą wodę w dz. 49/14 obręb 14-04, ul. Przemysłowa 1 w Nowy Dworze Mazowieckim

Ilość stron w przedmiotowym postępowaniu wynosi poniżej 20.

W załączeniu:

- 1. wniosek o wydanie decyzji o środowiskowych uwarunkowaniach
- 2. raport o oddziaływaniu na środowisko przedsięwzięcia (+ CD)
- 3. wypis i wyrys z miejscowego planu zagospodarowania przestrzennego miasta

Otrzymują:

1. Adresat

- 2. a/a Do wiadomości:
 - 1. Ekokogeneracja Development Sp.zo.o, Al. Jerozolimskie 91, 02-001 Warszawa
 - 2. Zakład Energetyki Cieplnej Spz.o.o, ul. Przemysłowa 1, 05-100 Nowy Dwór Mazowiecki
 - 3. La Lorraine Sp.zo.o, ul. Przemysłowa 1, 05-100 Nowy Dwór Mazowiecki
 - 4. DWT ul. Przemysłowa 3, 05-100 Nowy Dwór Mazowiecki
 - 5. APLA NDM Sp.zo.o, ul. Przemysłowa 2, 05-100 Nowy Dwór Mazowiecki
 - 6. Gmina Nowy Dwór Maz, Wydz. Gospodarki Nieruchomościami i Planowania przestrzennego



URZĄD MIEJSKI W NOWYM DWORZE MAZOWIECKIM ul. Zakroczymska 30 05-100 Nowy Dwór Mazowiecki Tel. (22) 51-22-000, (22) 51-22-101 Fax (22) 51-22-101

> sekretariat@nowydwormaz.pl www.nowydwormaz.pl

GK.6220.14.9.2014

Nowy Dwór Mazowiecki, dnia 03.06.2014r.

Państwowy Powiatowy Inspektor Sanitarny Ul. Chemików 6 05-100 Nowy Dwór Mazowiecki

Na podstawie 77 ust.1 pkt. 2 ustawy z 3 października 2008r. o udostępnianiu informacji o środowisku i jego ochronie, udziale społeczeństwa w ochronie środowiska oraz o ocenach oddziaływania na środowisko (Dz.U. nr 2013, poz. 1235) Burmistrz Miasta Nowy Dwór Mazowiecki zwraca się z prośbą o udzielenie opinii w sprawie realizacji przedsięwzięcia polegającego na

budowie kotłowni na ciepłą wodę w dz. 49/14 obręb 14-04, ul. Przemysłowa 1 w Nowy Dworze Mazowieckim

Ilość stron w przedmiotowym postępowaniu wynosi poniżej 20.

W załączeniu:

- 1. wniosek o wydanie decyzji o środowiskowych uwarunkowaniach
- 2. raport o oddziaływaniu przedsięwzięcia na środowisko (+CD)
- 3. wypis i wyrys z miejscowego planu zagospodarowania przestrzennego miasta

antic

Otrzymują:

- 1. Adresat
- 2. a/a

Do wiadomości:

- 1. Ekokogeneracja Development Sp.zo.o, Al. Jerozolimskie 91, 02-001 Warszawa
- 2. Zakład Energetyki Cieplnej Spz.o.o, ul. Przemysłowa 1, 05-100 Nowy Dwór Mazowiecki
- 3. La Lorraine Sp.zo.o, ul. Przemysłowa 1, 05-100 Nowy Dwór Mazowiecki
- 4. DWT ul. Przemysłowa 3, 05-100 Nowy Dwór Mazowiecki
- 5. APLA NDM Sp.zo.o, ul. Przemysłowa 2, 05-100 Nowy Dwór Mazowiecki
- 6. Gmina Nowy Dwór Maz, Wydz. Gospodarki Nieruchomościami i Planowania przestrzennego



URZAD MTEISKT W NOWYM DWORZE MAZOWIECKIM ul. Zakroczymska 30 05-100 Nowy Dwór Mazowiecki Tel. (22) 51-22-000, (22) 51-22-111 Fax (22) 51-22-101

> sekretariat@nowydwormaz.pl www.nowydwormaz.pl

GK.6220.14.12.2014

Nowy Dwór Mazowiecki, dnia 24.07.2014r.

ZAKŁAD ENERGETYKI CIEPLNEJ Spółka z o.o. 05-100 Nowy Dwór Mazowiecki 28.04.00/47. Podpis Junity 844 1000

Regionalny Dyrektor Ochrony Środowiska ul. Sienkiewicza 3 00-015 Warszawa

Dotyczy: wezwania Ζ dnia 30 czerwca 2014r. Znak WOOŚ-II.4242.185.2014.MZ

Na podstawie 77 ust. 1 pkt. 1 ustawy z 3 października 2008r. o udostępnianiu informacji o środowisku i jego ochronie, udziale społeczeństwa w ochronie środowiska oraz o ocenach oddziaływania na środowisko (Dz.U. nr 2013, poz. 1235) Burmistrz Miasta Nowy Dwór Mazowiecki zwraca się z prośbą o uzgodnienie warunków realizacji przedsiewzięcia polegającego na:

budowie kotłowni na ciepłą wodę w dz. 49/14 obręb 14-04, ul. Przemysłowa 1 w Nowy Dworze Mazowieckim

po uzupełnieniu raportu o oddziaływaniu na środowisko przedsiewziecja. Ilość stron w przedmiotowym postępowaniu wynosi poniżej 20.

W załączeniu:

- 1. wniosek o wydanie decyzji o środowiskowych uwarunkowaniach
- raport o oddziaływaniu na środowisko przedsięwzięcia (+ CD) 2.
- 3. wypis i wyrys z miejscowego planu zagospodarowania przestrzennego miasta

Otrzymują:

1. Adresat

2. a/a Do wiadomości:

- 1. Ekokogeneracja Development Sp.zo.o, Al. Jerozolimskie 91, 02-001 Warszawa
- 2. Zakład Energetyki Cieplnej Spz.o.o, ul. Przemysłowa 1, 05-100 Nowy Dwór Mazowiecki
- 3. La Lorraine Sp.zo.o, ul. Przemysłowa 1, 05-100 Nowy Dwór Mazowiecki
- 4. DWT ul. Przemysłowa 3, 05-100 Nowy Dwór Mazowiecki
- APLA NDM Sp.zo.o, ul. Przemysłowa 2, 05-100 Nowy Dwór Mazowiecki
 Gmina Nowy Dwór Maz, Wydz. Gospodarki Nieruchomościami i Planowania przestrzennego



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> sekretariat@nowydwormaz.pl www.nowydwormaz.pl

GK.6220.14.14.2014

Nowy Dwór Mazowiecki, dnia 24.07.2014r.

ZAKŁAD ENERGETYKI CIEPLNEJ Spółka z o.o. 05-100 Nowy Dwór Mazowiecki Wpłynęło dnia ... 28.01 2014v Podpis 2. dr. 845

Państwowy Powiatowy **Inspektor Sanitarny UI. Chemików 6** 05-100 Nowy Dwór Mazowiecki

WOOŚdnia 30 czerwca 2014r. Znak Dotyczy: wezwania Ζ II.4242.185.2014.MZ

Na podstawie 77 ust. 1 pkt. 1 ustawy z 3 października 2008r. o udostepnianiu informacji o środowisku i jego ochronie, udziale społeczeństwa w ochronie środowiska oraz o ocenach oddziaływania na środowisko (Dz.U. nr 2013, poz. 1235) Burmistrz Miasta Nowy Dwór Mazowiecki zwraca się z prośbą o uzgodnienie warunków realizacji przedsięwzięcia polegającego na:

budowie kotłowni na ciepłą wodę w dz. 49/14 obręb 14-04, ul. Przemysłowa 1 w Nowy Dworze Mazowieckim

po uzupełnieniu raportu o oddziaływaniu na środowisko przedsięwzięcia.

Ilość stron w przedmiotowym postępowaniu wynosi poniżej 20.

W załączeniu:

- wniosek o wydanie decyzji o środowiskowych uwarunkowaniach 1.
- raport o oddziaływaniu na środowisko przedsięwzięcia (+ CD) 2.
- wypis i wyrys z miejscowego planu zagospodarowania przestrzennego miasta 3.

Otrzymują:

1. Adresat 2. a/a

Do wiadomości:

- 1. Ekokogeneracja Development Sp.zo.o, Al. Jerozolimskie 91, 02-001 Warszawa
- Zakład Energetyki Cieplnej Spz.o.o, ul. Przemysłowa 1, 05-100 Nowy Dwór Mazowiecki
 La Lorraine Sp.zo.o, ul. Przemysłowa 1, 05-100 Nowy Dwór Mazowiecki
- 4. DWT ul. Przemysłowa 3, 05-100 Nowy Dwór Mazowiecki
- 5. APLA NDM Sp.zo.o, ul. Przemysłowa 2, 05-100 Nowy Dwór Mazowiecki
- Gmina Nowy Dwór Maz, Wydz. Gospodarki Nieruchomościami i Planowania przestrzennego

Appendix B

Letters below are answers to the letters in Appendix A from Regional Director of Environmental Protection in Warsaw (GK.6220.14.2.2014) and States District Sanitary Inspector in Nowy Dwor Mazowiecki (GK.6220.14.3.2014). The main text is translated by the author:

"This project requires environmental decision referred to in the Act of 3 October 2008 on the provision of information about *the environment and its protection, public participation in environmental protection and environmental impact assessment* (Dz U. 2013, poz 1235)."

Additional letter from Regional Director of Environmental Protection in Warsaw (GK.6220.14.4.2014) is attached. The main text is translated by the author:

"Kindly informs that in response to the request of the Mayor of Nowy Dwor Mazowiecki on the necessity of conducting the proceedings in environmental impact assessment for this project, the Regional Director of Environmental Protection in Warsaw by order of 24.04.2014 expressed the opinion that for the proposed project, it is necessary to carry out environmental impact assessment."



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> sekretariat@nowydwormaz.pl www.nowydwormaz.pl

GK.6220.14.2.2014

Nowy Dwór Mazowiecki, dnia 14.04.2014r.

Regionalny Dyrektor Ochrony Środowiska ul. Sienkiewicza 3 00-015 Warszawa

Na podstawie 64 ust.1 pkt. 1 i 2 ustawy z 3 października 2008r. o udostępnianiu informacji o środowisku i jego ochronie, udziale społeczeństwa w ochronie środowiska oraz o ocenach oddziaływania na środowisko (Dz.U. nr 2013, poz. 1235) Burmistrz Miasta Nowy Dwór Mazowiecki zwraca się z prośbą o udzielenie opinii w sprawie stwierdzenia obowiązku przeprowadzenia oceny oddziaływania na środowisko przedsięwzięcia polegającego na

budowie kotłowni na ciepłą wodę w dz. 49/14 obręb 14-04, ul. Przemysłowa 1 w Nowy Dworze Mazowieckim

Przedsięwzięcie to wymaga uzyskania decyzji środowiskowej o której mowa w ustawie z dnia 3 października 2008r. o udostępnianiu informacji o środowisku i jego ochronie, udziale społeczeństwa w ochronie środowiska oraz o ocenach oddziaływania na środowisko (Dz.U. 2013, poz. 1235.)

W odniesieniu do planowanego przedsięwzięcia zastosowano przepis § 3 ust. 1 pkt. 80 Rozporządzenia Rady Ministrów z dnia 9 listopada 2010r. w *sprawie przedsięwzięć mogących znacząco oddziaływać na środowisko* (Dz. U. 2013 poz. 817)

Ilość stron w przedmiotowym postępowaniu wynosi poniżej 20.

W załączeniu:

- 1. wniosek o wydanie decyzji o środowiskowych uwarunkowaniach
- 2. karta informacyjna przedsięwzięcia
- 3. wypis i wyrys z miejscowego planu zagospodarowania przestrzennego miasta

Otrzvmuja: 1. Adresat 2. a/a

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URZĄD MIEJSKI W NOWYM DWORZE MAZOWIECKIM ul. Zakroczymska 30 05-100 Nowy Dwór Mazowiecki Tel. (22) 51-22-000, (22) 51-22-111 Fax (22) 51-22-101

> sekretariat@nowydwormaz.pl www.nowydwormaz.pl

GK.6220.14.3.2014

Nowy Dwór Mazowiecki, dnia 14.04.2014r.

Państwowy Powiatowy Inspektor Sanitarny Ul. Chemików 6 05-100 Nowy Dwór Mazowiecki

Na podstawie 64 ust.1 pkt. 1 i 2 ustawy z 3 października 2008r. o udostępnianiu informacji o środowisku i jego ochronie, udziale społeczeństwa w ochronie środowiska oraz o ocenach oddziaływania na środowisko (Dz.U. nr 2013, poz. 1235) Burmistrz Miasta Nowy Dwór Mazowiecki zwraca się z prośbą o udzielenie opinii w sprawie stwierdzenia obowiązku przeprowadzenia oceny oddziaływania na środowisko przedsięwzięcia polegającego na

budowie kotłowni na ciepłą wodę w dz. 49/14 obręb 14-04, ul. Przemysłowa 1 w Nowy Dworze Mazowieckim

Przedsięwzięcie to wymaga uzyskania decyzji środowiskowej o której mowa w ustawie z dnia 3 października 2008r. o udostępnianiu informacji o środowisku i jego ochronie, udziale społeczeństwa w ochronie środowiska oraz o ocenach oddziaływania na środowisko (Dz.U. 2013, poz. 1235.)

W odniesieniu do planowanego przedsięwzięcia zastosowano przepis § 3 ust. 1 pkt. 80 Rozporządzenia Rady Ministrów z dnia 9 listopada 2010r. w *sprawie przedsięwzięć mogących znacząco oddziaływać na środowisko* (Dz. U. 2013 poz. 817)

Ilość stron w przedmiotowym postępowaniu wynosi poniżej 20.

W załączeniu:

- 1. wniosek o wydanie decyzji o środowiskowych uwarunkowaniach
- 2. karta informacyjna przedsięwzięcia
- 3. wypis i wyrys z miejscowego planu zagospodarowania przestrzennego miasta

Otrzymuja: 1. Adresat 2. a/a



GK.6220.14.4.2014

ZAKŁAD ENERGETYKI CIEPLNEJ Spółka z c.c. 05-100 Nowy Dwór Mazowiecki Wpłyneło dpia 09.05.01 Podpis J.h. 515 W NOWYM DWORZE MAZOWIECKIM ul. Zakroczymska 30 05-100 Nowy Dwór Mazowiecki Tel. (22) 51-22-000, (22) 51-22-111 Fax (22) 51-22-101

> sekretariat@nowydwormaz.pl www.nowydwormaz.pl

URZĄD MIEJSKI

Nowy Dwór Mazowiecki, dnia 06.05.2014r.

Wg. rozdzielnika

Dotyczy: postępowania w przedmiocie wydania decyzji o środowiskowych uwarunkowaniach na realizację przedsięwzięcia polegającego na: budowie kotłowni na ciepłą wodę w dz. 49/14 obręb 14-04, ul. Przemysłowa 1 w Nowy Dworze Mazowieckim.

Uprzejmie informuję, że w odpowiedzi na zapytanie Burmistrza Miasta Nowy Dwór Mazowiecki w przedmiocie konieczności przeprowadzania procedury oceny oddziaływania na środowisko dla przedmiotowego przedsięwzięcia Regionalny Dyrektor Ochrony Środowiska w Warszawie postanowieniem z dnia 24.04.2014 r. wyraził opinię ze dla planowanego przedsięwzięcia koniecznym jest przeprowadzenie oceny oddziaływania na środowisko.

W załączeniu kopia:

 Postanowienia Regionalnej Dyrekcji Ochrony Środowiska z dnia 25.05.2014r. (WOOŚ-II.4240.496.2014.MS)

attel

Otrzymują:

- 1. Ekokogeneracja Development Sp. zo. o, Al. Jerozolimskie 91, 02-001 Warszawa
- 2. Zakład Energetyki Cieplnej Sp. zo. o, ul. Przemysłowa 1, 05-100 Nowy Dwór Mazowiecki
- 3. La Lorraine Sp. zo. o, ul. Przemysłowa 1, 05-100 Nowy Dwór Mazowiecki
- 4. DWT ul. Przemysłowa 3, 05-100 Nowy Dwór Mazowiecki
- 5. APLA NDM Sp. z o. o, ul. Przemysłowa 2, 05-100 Nowy Dwór Mazowiecki
- Gmina Nowy Dwór Maz, Wydz. Gospodarki Nieruchomościami i Planowania przestrzennego

7: a/a

Appendix C

Letter from the investor Ekokogeneracja S.A, to the Mayor of Nowy Dwor Mazowiecki

The main text is translated by the author:

"Ekokogeneracja S.A would like to propose the city of Nowy Dwor Mazowiecki investment, which consists of the construction of a plant for the production of thermal energy from the process gasification of alternative fuel made from combustible fraction of municipal waste. Mr. Roman Glos, CEO of ZEC Sp. zoo expressed a preliminary interest in the proposed investment. In his opinion the investment could be located within the ZEC area. The whole project can be financed only by Ekokogeneracja S.A as an investor.

Our offer will give you tangible benefits:

- Energy from waste is energy from renewable sources
- Energy from waste from the plant to 20 MW does not require the purchase of emission rights to CO₂
- energy from our installation is constant and has stable price, because the cost of its production is independent of the cost of traditional energy
- thermal power plant can be easily adapted to the size of the recipient
- Lowering the cost of disposal of municipal waste.

The installation meets all the requirements relating to the process of thermal waste treatment, and standard emission requirements specified in the relevant laws."



Ekokogeneracja S.A. 02-001 Warszawa, Al. Jerozolimskie 91 tel.: +48 22 622-72-67 fax.: +48 22 627-32-95 www.ekokogeneracja.com

Pan Jacek Kowalski Burmistrz Miasta Nowy Dwór Mazowiecki

Warszawa, 16 października 2013 r.

Szanowny Panie Burmistrzu,

Ekokogeneracja S.A. chciałaby zaproponować miastu Nowy Dwór Mazowiecki inwestycję, polegającą na budowie instalacji do produkcji energii cieplnej z procesu zgazowywania paliwa alternatywnego z frakcji palnej odpadów komunalnych. Pan Roman Głos, Prezes Zarządu Zakładu Energetyki Cieplnej Sp. z o.o. wyraził wstępne zainteresowanie proponowaną inwestycją. W Jego opinii inwestycja mogłaby być zlokalizowana na terenie Zakładu Energetyki Cieplnej Sp. z o.o. Całość inwestycji może być finansowana wyłącznie przez Ekokogeneracja S.A. jako inwestora.

Nasza oferta da Państwu wymierne korzyści:

- energia z odpadów jest energią ze źródeł odnawialnych;
- energia z odpadów z instalacji do 20 MW nie wymaga zakupu praw emisyjnych do CO₂;
- energia z naszej instalacji ma stałą i stabilną cenę, ponieważ koszt jej wytworzenia jest niezależny od kosztu tradycyjnych nośników energii;
- moc cieplna instalacji może być z łatwością dostosowana do wielkości odbiorcy.
- obniżenie kosztów utylizacji odpadów komunalnych.

Załączamy ulotkę prezentującą proponowane przez nas rozwiązanie. Na naszej stronie internetowej www.ekokogeneracja.com zamieszczony jest film przedstawiający naszą instalację.

Instalacja spełnia wszystkie wymagania, dotyczące prowadzenia procesu termicznego przekształcania odpadów, wymagania standardów emisyjnych, określone w odpowiednich przepisach prawnych.

Aktualnie realizujemy jedną inwestycję z wykorzystaniem paliwa alternatywnego w Przedsiębiorstwie Energetyki Cieplnej Sp. z o.o. w Brodnicy w woj. kujawsko-pomorskim oraz budowę dwóch instalacji z wykorzystaniem procesu zgazowywania pierza w firmach drobiarskich Bomadek Sp. z o.o. oraz IKO Kompania Drobiarska Sp. z o.o.

Zwracamy się z prośbą o spotkanie z udziałem Pana Burmistrza, Prezesa Zakładu Energetyki Cieplnej oraz osoby odpowiedzialnej za problematykę zagospodarowania odpadów celem przedstawienia naszej propozycji. Prosimy o wskazanie dogodnego terminu i godziny spotkania pomiędzy 28 a 31 października.

Zapraszamy Pana do kontaktu telefonicznego z panem Marcinem Meyerem, pod nr 603 653 666 lub na adres mailowy <u>mmeyer@ekokogeneracja.com</u>, celem ustalenia dogodnego terminu spotkania.

Z poważaniem,

Wy d

Wojciech Rychlicki Prezes Zarządu Ekokogeneracja S.A.

Ekokogeneracja S.A. wpisana jest do Krajowego Rejestru Sądowego prowadzonego przez Sąd Rejonowy dla m. st. Warszawy, XII Wydział Gospodarczy Krajowego Rejestru Sądowego pod numerem KRS 0000364229, NIP: 521-35-11-744, REGON 141699367. Kapitał zakładowy wpłacony wynosi 980.000 zł.