



REPORT

THE AGRICULTURE BIOGAS MARKET ACTORS IN POLAND

Prepared by:

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1 SUMMARY

The agricultural biogas market in Poland can be divided into :

1. Ministries and Dependent Agencies.
2. Associations and Consultants.
3. Financial Institutions.
4. Developers - Biogas Plants Owners.
5. Constructors and Technology Providers.

All group entities play a role in the biogas market, having significant impact on the direction of development of the sector. However, there is not yet a national agency that comprehensively coordinate development of the industry and could determine the appropriate technical standards, economic and legal framework for the sector. There is also no leading national company offering a comprehensive, custom solutions technology that could be used as a reference. In this situation, the directions for development of biogas plants in Poland are strongly influenced by the experience transferred from other EU countries, leading to the area, in particular, cooperation with Germany, Austria, Sweden and Denmark. There is a gap between the general political documents and directional program documents and implementing them legal documents; organizational base, business and technology.

2 INTRODUCTION

Large farms, food, energy, trade or building companies, as well as investment funds are investors on the biogas market. Developers running biogas projects for sale constitute a great share of the market. Depending on the capability of capital involvement, shares of the company carrying out the given project may be sold after the facility is started or the project may be prepared for sale earlier, after obtaining all required licenses, having all the contracts and letters of intent signed and, optionally, after obtaining financing [1].

The first biogas facility was located in Pawłówko, next to a swine farm that belonged to Poldanor S.A., an agricultural company with Danish capital founded in 1994. From the beginnings of its activity the company attached great significance to modern innovative solutions in agriculture. The first plans concerning building agricultural biogas plants emerged as early as in 1999. They were executed in June 2005, when the biogas plant in Pawłówko was launched. Three years later next facilities were built – in Kujanki and Płaszczycza. Satisfying outcomes as well as favorable regulations environment led to a decision to continue the development of electric energy production sector. Currently the company is the unquestionable leader on the market of agricultural biogas plants in Poland. Poldanor manages 8 biogas plants with total installed electric capacity of 7,4 MWe, which constitutes about 15% of the capacity of all existing biogas plants in the country. The intention of the company for the next few years is to build another 6 agricultural biogas power plants.

It is typical that the development of agricultural biogas plants in Poland was initiated by companies with foreign capital: Poldanor S.A. is a company with Danish capital, Niedoradz biogas plant came into existence thanks to American capital, Spółka Rolna Kalsk belongs to an Italian, Piantini Gulio Luigi, company operating the plant in Grzmiąca is partly constituted by foreign capital, and one of the most recently built facilities, in Bielany Wrocławskie, exists, in part, thanks to capital from Luxembourg. The agricultural plants functioning and operating experience from the West was thus transferred to Poland, which, probably, significantly speeded up the development of the technology in the country [1].

3 AGRICULTURE BIOGAS MARKET ACTORS IN POLAND

The main Market Actors in the Polish biogas market are companies that now own biogas plants, but we must not forget that in addition to the owners of biogas plants important role is played by other institutions, affecting the biogas market . For the purposes of this study institutions are divided into the following groups :


1. Ministries and Dependent Agencies. The stability of the law is one of the basic elements for business.
2. Associations and Consultants. Associations and consulting companies support the development of its market knowledge and experience.
3. Financial Institutions. Poland takes full advantage of investment funding from EU sources. Over the correct realization of programs related to the financing of investments armed state institutions.
4. Developers - Biogas Plants Owners. It is a core group that operates in the biogas. They ultimately affect the size of the installed capacity in agricultural biogas plants.
5. Constructors and Technology Providers. Construction of individual elements of a biogas plant requires the involvement of specialized companies who will deal with the construction of reservoirs and supply of biogas plants components.

Biogas plant construction is associated with the acquisition of certain permits. Permits necessary for the realization of the investment in a biogas plant are:

- Decision on environmental permit for the project.
- The decision on conditions for connection to the network.
- The decision on building conditions.
- Water permit.

An important element is the interaction described above market players and working out relationships that ensure the effective implementation of the investment.

3.1 MINISTRIES AND DEPENDENT AGENCIES

<p>Name: Ministry of Economy</p> <p>Group: Ministries and Agencies</p>	
<p>Characteristics:</p> <p>The Ministry of Economy is a professional, effective and credible, based on new technologies institution which carries on a dialogue with the social partners, the government's economic policies, including through active participation in the work of European Union and International Organizations.</p> <p>The strategic priorities of the Ministry of Economy</p> <ol style="list-style-type: none"> 1. Supporting entrepreneurship, innovation and competitiveness. 2. Better regulation. 3. Partnership for economic development. 4. Activity on the international market. 5. Economic security of the country. 6. Efficient administration. 	
<p>Direct connection with Biogas Market:</p> <p>On 13 July 2010 the Council of Ministers adopted developed by the Ministry of Economy in cooperation with the Ministry of Agriculture and Rural Development document entitled.: "Directions of development of agricultural biogas plants in Poland in the years 2010-2020".</p> <p>The document assumes that every Polish municipality until 2020 rise an average of one biogas plant using biomass of agricultural origin assuming ownership by the community right conditions to start such a venture.</p> <p>The main purpose of the document is to optimize the legal and administrative system on setting up biogas plants in Poland and an indication of co-financing opportunities this type of installation of the public, both national and European Union, are available in the national and regional operational programs.</p>	<p>Contact:</p> <p>Plac Trzech Krzyży 3/5 00-507 Warszawa Phone: 22 693 50 00 www.mg.gov.pl</p> <p>Appendixes:</p> <p>Appendix 1</p> <p>"Directions of development of agricultural biogas plants in Poland in the years 2010-2020".</p> <p>Appendix 2</p> <p>"Energy Policy of Poland until 2030".</p>

Name: Ministry of Agricultural and Rural Development		
Group: Ministries and Agencies		
Characteristics: Ministry of Agriculture and Rural Development - Polish Ministry dealing with matters of agricultural production, rural development, food industry, fisheries and supervision of phytosanitary and veterinary standards. The Ministry of Agriculture and Rural Development directs the following government departments: <ol style="list-style-type: none"> 1. Agriculture. 2. The development of rural areas. 3. Agricultural markets. 4. Fisheries. 		
Direct connection with Biogas Market: Documents of the Ministry of Agriculture and Rural Development and the Ministry of Economy present the development and use of Renewable Energy Sources (RES) as strategic goal. The leading role in its implementation is attributed to the sectors of agriculture and energy. The role of the agricultural sector is to be not only to invest and operate agro installation, but also stimulate farms to mobilize additional sources of revenue, which in turn should stimulate rural development, accelerate the development of rural infrastructure and cause an increase in employment in enterprises operating in the environment agriculture. Ministry of Agricultural and Rural Development maintains direct contact with Biogas Market by the Agricultural Market Agency.		Contact: Wspólna Street 30 00-930 Warsaw Phone: 22 623 10 00 www.minrol.gov.pl
		Appendixes: Appendix 1 "Directions of development of agricultural biogas plants in Poland in the years 2010-2020".

Name: Agricultural Market Agency

Group: Ministries and Agencies



**Agencja
Rynku
Rolnego**

Characteristics:

Agricultural Market Agency (ARR) is a state institution supervised by the Ministry of Agriculture and Rural Development as well as the Ministry of Finance within the scope of the Common Agricultural Policy (CAP) of the EU and related tasks. Since 1990 the ARR has been carrying out activities aimed at supporting and maintaining economic balance in the Polish agri-food sector. Since 2004 the Agency is an accredited EU Paying Agency distributing financial support and performing controls relative to manufacturing of agricultural products under the CAP.

ARR TASKS:

- Distribution of funds to the beneficiaries under selected CAP and national schemes.
- Promotion of agri-food products in the EU and third countries.
- Conducting activities aimed at strengthening the development of external trade exchange.
- Collecting, analyzing, processing and publishing information on the agri-food markets in Poland and abroad as well as preparing forecasts for these markets.
- Dissemination of information on the CAP schemes implementation and informing CAP schemes' participants on terms and decisions taken at the EU level.
- Participation in the EU decision making process as regards relevant policy areas
- Institutional support under pre-accession assistance programs for the agri-food sector institutions of the EU Candidate Countries as well as expert support for the institutions of developing countries

Direct connection with Biogas Market:

Agricultural Market Agency is responsible for keeping the register of energy companies involved in the production of agricultural biogas.

Contact:

Nowy Świat 6/12 Str.
00-400 Warsaw
Phone: 22 661-72-72
www.arr.gov.pl

Name: Agency for Restructuring and Modernisation of Agriculture



Agencja Restrukturyzacji
i Modernizacji Rolnictwa

Group: Ministries and Agencies

Characteristics:

The Agency for Restructuring and Modernization of Agriculture (ARMA) was established in 1994 with the aim of supporting the agriculture and rural development. ARMA has been designated by the Government of the Republic of Poland to perform the role of an accredited paying agency. It deals with the implementation of instruments co-financed from the European Union budget and provides aid from national funds. The Agency, as the performer of agricultural policy, cooperates with the Ministry of Agriculture and Rural Development. At the same time, ARMA is under supervision of the Ministry of Finance within the scope of managing public funds.

The Agency for Restructuring and Modernization of Agriculture is headed by the President appointed by the Prime Minister of the Republic of Poland upon the request of the Minister of Agriculture and Rural Development and the Minister of Finance. The structure of ARMA comprises three levels: the Headquarters, 16 Regional Offices in each voivodship (province) and 314 Poviats (county) Bureaus.

The main beneficiaries of measures implemented by ARMA are farmers, rural inhabitants, entrepreneurs from agri-food sector, inhabitants of rural areas and local governments. The Agency also provides aid to the entities from the fisheries sector.


Direct connection with Biogas Market:

Agency for Restructuring and Modernization Of Agriculture is responsible for keeping the register livestock in Poland (cattle, swine, sheep, goat).

Contact:

Poleczki 33 Street
02-822 Warsaw
Phone: 800 38-00-84
www.arimr.gov.pl

3.2 ASSOCIATIONS AND CONSULTANTS

Name: Polish Biogas Association Group: Associations and Consultants	
Characteristics: <p>Polish Biogas Association (PBA) continues the activities of the Foundation "Polish Biogas Association" Bionea. The purpose of the PBA is to create a lobby that would affect the shape of the law on the use of biogas as an alternative energy source. Through educational activities PBA creates a training program for farmers wanting to participate as an investor or supplier substrates. PBA is also open to proposals for action of its new members who wish along with the PBA to create favorable conditions for the development of the idea of biogas in Poland. Currently, among the members of the association sits on over 40 different persons.</p>	
Direct connection with Biogas Market: <p>Polish Biogas Association brings together individuals and companies involved in the use of agriculture biogas and conducts educational activities.</p>	Contact: Aleja Zwycięstwa 96/98 81-001 Gdynia Phone: 58 622-81-81 www.pba.org.pl

Name: Bio Alians
Group: Associations and Consultants



Characteristics:

Bio Alians is a professional team with a full range of competencies necessary for the rapid development of biogas projects. In particular, it is worth noting:

1. Knowledge of the energy market.
2. Direct experience in the industry.
3. Obtaining funds - cooperation with experts experienced in financing biogas from public funds (EU and national).
4. Project management.
5. Experience of the largest Polish companies.
6. Experience of strategic consulting firms.
7. Competence in regulation.

Bio Alians is able to perform the entire investment process from its initial phase of the study, the full implementation of the production:

- The process of obtaining permits.
- Studies substrates.
- Optimization of technology selection.
- Construction Projects.
- Valuation of projects.
- Feasibility Study.
- Audit and Risk Management.
- Financial engineering project.

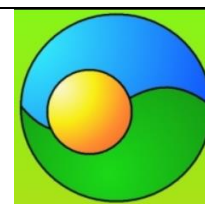
Direct connection with Biogas Market:

Bio Alians is a consultancy company which provides support project for the construction of biogas plants. Currently supports 8 projects for the construction of biogas plants in Poland.

Contact:

Solec 81B/73A Street
00-382 Warsaw
Phone: 22 201-90-39
www.bioalians.pl

Name: Ekoenergia
Group: Associations and Consultants



Characteristics:

EKOENERGIA was established in 2007 as a successor to EKOENERGOTERM and the BOMA Private Enterprise. During their operation these enterprises focused on the bioenergy power sector (especially on biogas based power sources), at one point in time being the distribution of Czech cogenerated energy conversion units fuelled with biogas produced by TEDOM.

For several years main focus of the company has been the design and development of bioenergy power plants as well as biogas plants.

Together with the TERMO-KLIMA MK company from Katowice, EKOENERGIA owns the rights to the ELECTRA® technology. It is one of the most modern, waste-free and odor-free technologies for bioenergy power plant and biogas plant construction in the world. In co-operation with TERMO-KLIMA MK Ekoenergia have also developed an innovative design for a vertical mixing unit with slitted impeller blades, recognized by the main players on the European biogas technology market.

EKOENERGIA (including its predecessor companies) is one of the oldest companies in the field of RES in Poland.

Direct connection with Biogas Market:

Over the last eighteen years Ekoenergia and its predecessor companies have prepared over 90 blueprints for bioenergy power plants fuelled with biogas derived from processed plant biomass (mainly silage), animal-derived biomass, animal waste with and without bedding (including materials with high nitrogen content) and various types of post-production waste from the food and agricultural industry (dairies, breweries, distilleries, oil mills, fruit and vegetable processing plants, meat processing plants, pasta manufactures, slaughterhouses, cold storage facilities etc.).

Contact:

Kolonia Pozezdrze 47
11-610 Pozezdrze
Phone: 600 135-708
www.ekoenergia-oze.pl

3.3 FINANCIAL INSTITUTIONS

Name: National Fund for Environmental Protection and Water Management



National Fund
for Environmental Protection
and Water Management

Group: Financial Institutions

Characteristics:

The National Fund of Environmental Protection and Water Management (NFEP&WM) which was established in 1989 as a result of the regime transformation in Poland, in cooperation with voivodeship (province) funds for environmental protection and water management is the pillar of the Polish system of financing environmental protection. The basis of the National Fund's operation as a State legal person is the Act on Environmental Protection Law.

NFEP&WM runs independent finances pursuant to the Act: Environmental Protection Law. By putting the principle of "polluter pays" into practice, the National Fund collects funds mostly from: fees and fines for exploitation of the environment, mining fees and concession fees, payments resulting from Energy Law and the Act on recycling of end-of-life vehicles, revenue from sales of CO₂ units and other sources. The National Fund ensures the use of foreign funds for environmental protection from, *inter alia*, the Cohesion Fund, the European Regional Development Fund, the LIFE+ financial instrument, the Norwegian Financial Mechanism and the European Economic Area Financial Mechanism. Owing to the Green Investment Scheme (GIS) and funds obtained by Poland in international sales transactions of CO₂ emission allowances granted under the Kyoto Protocol, the National Fund co-finances investments from the field of climate protection and reduction of CO₂ emissions.

GIS is a mechanism linking sales of Assigned Amount Units (AAUs) to investments that reduce GHG emissions through allocation of proceeds from the sales of AAUs for implementation of projects and programs focusing on GHG emissions reduction and adaptation to climate changes (so called "greening"). Under a GIS, the selling country needs to assure buyers that the proceeds from the sale of AAUs would be used to finance agreed projects and programs, and credible monitoring and verification measures would need to be adopted. In return the buying country would provide financing for the GIS under the terms of a negotiated contract.

Participation in the EU Emission Trading Scheme presents some limitation to the use of revenues from International Emissions Trading. According to the EU state aid rules, the operators of installations covered by the ETS – such as power sector and a number of large industrial plants - can have only limited access to revenues generated by greening, as this would interfere with the regulations of the

<p>Name: National Fund for Environmental Protection and Water Management</p> <p>Group: Financial Institutions</p>	 <p>National Fund for Environmental Protection and Water Management</p>
<p>EU Emission Trading Scheme and could distort competition on the European market. Therefore the bulk of revenues from selling allowances under GIS agreements would most likely be transferred to programs and projects implemented by entities not participating in the ETS.</p>	
<p>Direct connection with Biogas Market:</p> <p>As of April 29, 2008 Poland met specific criteria and became eligible to engage in international emissions trading (Article 17 of the Kyoto Protocol) including trading of AAUs. The Polish Act on management of GHG emissions and emissions of other substances adopted on July 17, 2009 defines:</p> <ul style="list-style-type: none"> • Proceeds from the transactions can be spent on hard greening, as well as on soft greening. • Transparent rules for acquiring of the applications for projects, that can be co-financed from the GIS proceeds. • Robust but flexible regulations for monitoring, reporting and verification of the effects provided by the projects. • Other operational rules of National Green Investment Scheme. <p>According to the Act, the operating entity for the National GIS is the National Fund for Environmental Protection and Water Management (NFEP&WM).</p>	<p>Contact:</p> <p>Konstruktorska 3a Str. 02-673 Warsaw Phone: 22 45 90 370 www.nfosigw.gov.pl</p> <hr/> <p>Appendixes:</p> <p>Appendix 3</p> <p>“Green Investment Scheme – Part 2: Agriculture Biogas Plants”.</p>

Name: Regional Funds for Environmental Protection and Water Management Group: Financial Institutions		
Characteristics: Regional Funds for Environmental Protection jointly form a system of financing environmental protection in Poland, and often work together, but they are independent, have separate budgets, their own action plans and other superiors. National Fund is subject to the supervision of the Ministry of Environment, the provincial funds - the right to the management of regional government. Below is a list and contact details of 16 Regional Funds for Environmental Protection.		
	Regional Funds for Environmental Protection in Wrocław	Contact: Jastrzębia 24 Street 53-148 Wrocław Phone: 71 332-37-76 www.wfosiqw.wroclaw.pl
	Regional Funds for Environmental Protection in Toruń	Contact: Szosa Chelmińska 28 Street 87-100 Toruń Phone: 56 621-23-00 www.wfosiqw.torun.pl
	Regional Funds for Environmental Protection in Lublin	Contact: Spokojna 7 Street 20-074 Lublin Phone: 81 532-17-64 www.wfos.lublin.pl
	Regional Funds for Environmental Protection in Zielona Góra	Contact: Miodowa 11 Street 65-602 Zielona Góra Phone: 68 419-69-00 www.wfosiqw.zgora.pl
	Regional Funds for Environmental Protection in Łódź	Contact: Łąkowa 11 Street 90-562 Łódź Phone: 42 663-41-01 www.wfosiqw.lodz.pl
	Regional Funds for Environmental Protection in Kraków	Contact: Kanonicza 12 Street 31-002 Kraków Phone: 12 422-94-90 www.wfos.krakow.pl
	Regional Funds for Environmental Protection in Warsaw	Contact: Ogrodowa 5/7 Street 00-893 Warsaw Phone: 22 853-53-21 www.wfosiqw.pl

Name: Regional Funds for Environmental Protection and Water Management Group: Financial Institutions		
	Regional Funds for Environmental Protection in Opole	Contact: Krakowska 53 Street 45-018 Opole Phone: 77 453-76-11 www.wfosiqw.opole.pl
	Regional Funds for Environmental Protection in Rzeszów	Contact: Zygmuntowska 9 Street 35-025 Rzeszów Phone: 17 85-22-344 www.wfosiqw.rzeszow.pl
	Regional Funds for Environmental Protection in Białystok	Contact: Św. Rocha 5 Street 15-879 Białystok Phone: 85 74-60-241 www.wfosiqw.bialystok.pl
	Regional Funds for Environmental Protection in Gdańsk	Contact: Straganiarska 24-27 Street 80-837 Gdańsk Phone: 58 305-56-31 www.wfosiqw-gda.pl
	Regional Funds for Environmental Protection in Katowice	Contact: Plebiscytowa 19 Street 40-035 Katowice Phone: 32 60-32-200 www.wfosiqw.katowice.pl
	Regional Funds for Environmental Protection in Kielce	Contact: Św. Leonarda 7 Street 25-311 Kielce Phone: 41 366-15-12 www.wfos.com.pl
	Regional Funds for Environmental Protection in Olsztyn	Contact: Św. Barbary 9 Street 10-026 Olsztyn Phone: 89 522-02-00 www.wfosiqw.olsztyn.pl
	Regional Funds for Environmental Protection in Poznań	Contact: Szczepanowskiego 15a Street 60-541 Poznań Phone: 61 845-62-00 www.wfosgw.poznan.pl
	Regional Funds for Environmental Protection in Szczecin	Contact: Solskiego 3 Street 71-323 Szczecin Phone: 91 48-615-56 www.wfos.szczecin.pl

3.4 DEVELOPERS – BIOGAS PLANTS OWNERS

<p>Name: Poldanor S.A. Group: Developers</p>	
<p>Characteristics:</p> <p>Poldanor is an agricultural company known throughout Europe. It acquired its first farm in 1994. In 2011, Poldanor manages crop production on a total area of 15,000 hectares, and pig production based on a foundation herd of over 18,100 sows. Pig production takes place at more than 30 farms. Poldanor is part of the AXZON Group, a global concern focused on sustainable development of agricultural business and providing consumers with high-quality food products.</p> <p>Poldanor has its roots in modern Danish agriculture, and it carries on complementary agricultural activities by satisfying some of its demand for feed with its own grain production, and by utilising animal dung to produce biogas and renewable energy. Its production employs modern and balanced technologies, bringing the company near to “precision farming”. These methods are sustainable, emphasising stability and respect for the geographical and social environment.</p> <p>The Company started working on the concept of biogas plants in 1999. In 2005, Poldanor built and launched the first agricultural biogas plant in Poland, and thus began the implementation of a programme which provides for the development of a total of 14 such plants next to pig farms operated by the company. To 2011, Poldanor has set up 8 working biogas plants in Poland, with a total power of 7.4 MWe.</p>	
<p>Direct connection with Biogas Market:</p> <p>The company Poldanor S.A. is an investor of the agricultural biogas plants in: Koczała, Pawłówko, Płaszczycza, Naclaw, Świolino, Uniechówek, Giżyno, Kujanki.</p>	<p>Contact:</p> <p>Dworcowa 25 Str. 77-320 Przechlewo Phone: 59 833 43 61 www.poldanor.com.pl/en</p>

Name: Biogaz Agri Sp. z o.o.	
Group: Developers	
Characteristics: Biogaz Agri Sp z. o.o. is a company operating in the industrial sector. Type of service provided by its business has been in the European Classification of Activities classified as: Manufacture of gas; distribution of gaseous fuels through pipeline.	
Direct connection with Biogas Market: The company Biogaz Agri Sp. z o.o. is an investor of an agricultural biogas plant in Niedoradz.	Contact: Łosice 14C Str. 55-095 Łosice Phone: 71 315 43 17

Name: Gospodarstwo Rolne w Bukowie Sp. z o.o.	
Group: Developers	
Characteristics: Agricultural company engaged in the agricultural and animal husbandry.	
Direct connection with Biogas Market: The company Gospodarstwo Rolne w Bukowie Sp. z o.o. is an investor of an agricultural biogas plant in Kalsk.	Contact: Buków 56 Str. 66-100 Sulechów Phone: 68 385 72 94

Name: **Elektrownie Wodne Sp. z o.o.**

Group: **Developers**



Characteristics:

Spółka Elektrownie Wodne Sp. z o.o. is engaged in generation of electricity and services in the operation of hydroelectric power plants, as well as business development in the production of energy from renewable sources through the implementation of projects of wind farms and biogas plants. As part of its structure operates 21 hydropower plants with a total installed capacity of 60.43 MW wind farm consisting of three modern wind turbines Enercon - 82 of the total output of 6 MW and biogas power plant with a capacity of 2.13 MW.

On 31 December 2013 ENEA merged with Elektrownie Wodne Sp. z o.o., Elektrociepłownia Białystok S.A, and DOBITT Energia Sp. z. o.o.

The merger was effected through the transfer of all the assets of the Acquired Companies Production ENEA S.A.

Direct connection with Biogas Market:

The company Elektrownie Wodne Sp. z o.o. is an investor of an agricultural biogas plant in Liszkowo.

Contact:

Samociażek 92 Str.
86-010 Koronowo
Phone: 52 38 25 800
www.ew.koronowo.pl

Name: Biogaz Zeneris Sp. z o.o.



Group: Developers

Characteristics:

BIOGAZ ZENERIS Sp. z o.o. is a Polish company specializing in preparation and implementation of biogas stations, using BIOGAZ ZENERIS technology.

The basic services of BIOGAZ ZENERIS include:

- Advise in the field of construction and exploitation of biogas plants.
- Designs of biogas installations.
- Support for investors during the stage of administration decisions acquisition.
- Construction and contractory works yielding a ready biogas plants.
- Laboratory studies and analyses of substrates for biogas production.
- Advise in the field of biogas plant funding.
- Operation and maintenance of biogas plants.

Direct connection with Biogas Market:

The company Biogaz Zeneris Sp. z o.o. is an investor of an agricultural biogas plant in Skrzatusz.

Contact:


Paderewskiego 7 Str.
61-770 Poznań
Phone: 61 851 60 25
www.biogaz.com.pl

Name: Eko-Energia Grzmiąca Sp. z o.o.	
Group: Developers	
Characteristics: Eko-Energia Grzmiąca Sp. z o.o. managing of agriculture biogas plant in Grzmiąca. Biogas plant with a capacity of 1.6 MW has been built in 2010.	
Direct connection with Biogas Market: The company Eko-Energia Grzmiąca Sp. z o.o. is an investor of an agricultural biogas plant in Grzmiąca.	Contact: Grzmiąca 11 78-450 Grzmiąca Phone: 602 532 141

Name: BIO-WAT Sp. z o.o.	
Group: Developers	
Characteristics: The company designed and in 2011 built a biogas power plants in Świdnica. The cost of a biogas plant is about 15 million PLN, half of which was financed by the European Union within the framework of the restructuring of the Polish sugar industry.	
Direct connection with Biogas Market: The company BIO-WAT Sp. z o.o. is an investor of an agricultural biogas plant in Świdnica.	Contact: Metalowców 22 Str. 58-100 Świdnica Phone: 608 470 833 www.bio-wat.eu

Name: BIO-BUT Sp. z o.o.	
Group: Developers	
Characteristics: The company BIO-BUT Sp. z o.o., which is owned by Mr. Wladyslaw Butor, who is also the owner of the farm. Installation works with agricultural distillery, using as feedstock distillery slop and supplying process steam distillery. Wolf system built fermentation tanks.	
Direct connection with Biogas Market: The company BIO-BUT Sp. z o.o. is an investor of an agricultural biogas plant in Łany Wielkie.	Contact: Łabędzka 54 Str. 44-153 Łany Wielkie Phone: 32 238 77 57

Name: Bioelektrownia Sp. z o.o.	
Group: Developers	
Characteristics: The company designed and in 2011 built a biogas power plants in Uhnin. Construction of Agricultural Biogas plant in Uhnin was financed under the Innovative Economy Operational Programme.	
Direct connection with Biogas Market: The company Bioelektrownia Sp. z o.o. is an investor of an agricultural biogas plant in Uhnin.	Contact: 21-211 Uhnin, 141 Phone: 83 355 71 82

Name: Bioenergy Project Sp. z o.o. Group: Developers	
Characteristics: The company designed and in 2012 built a biogas power plant in Konopnica.	
Direct connection with Biogas Market: The company Bioenergy Project Sp. z o.o. is and investor of an agricultural biogas plant in Konopnica.	Contact: Rajska 4/23 Str. 02-654 Warszawa Phone: 46 837 03 87 http://bep.net.pl

Name: Allter Power Sp. z o.o. Group: Developers	
Characteristics: The company was established in October 2004 for the implementation of a project aimed at the production of green electricity using the energy infrastructure of the former sugar factory. Purchased objects are the property after Szamotuły Sugar Factory and Sugar Factory Melno. Company Allter Power Sp. z o.o. built a biogas plant with an electrical capacity of 1.6 MW and 1.8 MW of thermal power. The installation is located in the industrial area (the former sugar factory) in Melno. Project implemented by Allter Power Sp. z o.o. received funding under action 9.1 of the Operational Programme Infrastructure and Environment.	
Direct connection with Biogas Market: The company Allter Power Sp. z o.o. is an investor of an agricultural biogas plant in Melno.	Contact: Chałubińskiego 8 Str. 00-613 Warszawa Phone: 22 203 47 25 http://allterpower.pl/pl/

Name: Wikana Bioenergia Sp. z o.o.

Group: Developers



Characteristics:

WIKANA BIOENERGIA Sp. z o.o. was established under the joint venture agreement within the Group as a Wikana under the project "Renewable Energy Sources".

Wikana Bioenergy Sp. z o.o. is an entity engaged in construction of biogas plants. The concept of technological investment is based on the well-known and already widely used in Europe (Germany, Austria, the Netherlands) NaWaRo technology, which means "renewable sources".

Direct connection with Biogas Market:

The company Wikana Bioenergia Sp. z o.o. is an investor of an agricultural biogas plant in Piaski.

Construction of Agricultural Biogas plant in Piaski was partially financed with funds granted by the Ministry of Infrastructure.

Contact:

Cisowa 11 Str.
20-703 Lublin
Phone: 81 444 64 80
www.wikanabioenergia.pl

Name: AWW Wawrzyniak Sp. j.

od ziarna do butelki
Group: Developers

Characteristics:

AWW is a family company which has been carrying out widely understood agricultural activities connected with primal production and processing for over 20 years. In its farms, the group cultivates raw materials which are then processed to obtain final products at production plants in:

- Zbiersk.
- Kalisz.
- Tursko.
- Lubczyn.


Thanks to numerous investments in innovative technological solutions based on the advanced available knowledge, AWW has become a company that sets out new standards of production and product quality and modernity. Such installations like a rectified alcohol production plant in Zbiersk, where ethanol, biogas and combined heat and power lines operate in the complete energy and environmental synergy, are unique on a global scale.

Direct connection with Biogas Market:

The company AWW Wawrzyniak Sp. j. is an investor of an agricultural biogas plant in Zbiersk – Cukrownia.

Contact:


Niedźwiady 45 Str.
62-800 Kalisz
Phone: 62 760 34 13
www.aww.com.pl/en/

<p>Name: Biogal Sp. z o.o. Group: Developers</p>	
<p>Characteristics:</p> <p>Main activities of the company: Production of electricity, transmission of electricity, distribution of electricity and trade of electricity</p> <p>Products and Services:</p> <ol style="list-style-type: none"> 1. Commercial production of pigs. 2. Farms. 3. Production of ethanol. 4. Heat generation. 5. Electricity generation. 6. Agricultural biogas plants - construction and expansion. 	
<p>Direct connection with Biogas Market:</p> <p>The company Biogal Sp. z o.o. is an investor of an agricultural biogas plant in Boleszyn.</p> <p>Construction of Agricultural Biogas plant in Boleszyn was partly financed by the Operational Programme Infrastructure and Environment.</p>	<p>Contact:</p> <p>Boleszyn 7 13-308 Mroczno Phone: 56 474 11 12 http://biogal.pl</p>


Name: Gospodarstwo Rolne Kargowa - Klępsk Ryszard Maj	
Group: Developers	
Characteristics: Agricultural Farm Kargowa - Klępsk Ryszard Maj is engaged in the cultivation of cereals.	
Direct connection with Biogas Market: The company Gospodarstwo Rolne Kargowa - Klępsk Ryszard Maj is an investor of an agricultural biogas plant in Klępsk.	Contact: Dworcowa 26 Str. 66-120 Kargowa Phone: 603 864 205


Name: P.P.-H.-U. "SERAFIN" Sp. z o.o.	
Group: Developers	
Characteristics: Electricity generation from agricultural biogas cogeneration system.	
Direct connection with Biogas Market: The company P.P.-H.-U. "SERAFIN" Sp. z o.o. is an investor of an agricultural biogas plant in Szklarka Myślniewska.	Contact: Szklarka Myślniewska 68a Str. 63-500 Ostrzeszów

Name: Elektrociepłownia Bartos Sp. z o.o.	
Group: Developers	
Characteristics: The company designed and in 2012 built a biogas power plants in Piekoszów. Construction of Agricultural Biogas plant in Piekoszów was partially financed with funds from the Innovative Economy Operational Programme - Action 1.4.	
Direct connection with Biogas Market: The company Elektrociepłownia Bartos Sp. z o.o. is an investor of the agricultural biogas plant in Piekoszów.	Contact: Czarnowska 6 Str. 26-065 Piekoszów Phone: 41 306 12 00 http://www.ecbartos.pl/


<p>Name: Polskie Biogazownie "Energy Zalesie" Sp. z o.o.</p> <p>Group: Developers</p>	
<p>Characteristics:</p> <p>Polskie Biogazownie Energy Zalesie Sp. z o.o. is a company operating in the electrical industry. Type of service provided by its business has been in the European Classification of Activities classified as: production of electricity in thermal power plants, water (including pumped-pumped storage), nuclear, geothermal, wind, and other types.</p> <p>Polskie Biogazownie "Energy-Zalesie" Sp. z o.o. is owned by company Polskie Biogazownie S.A., founded by Kopex SA, and now belonging to Polenergia Biogaz Sp. z o.o. (Kulczyk Investment) 75% stake and private investors.</p> <p>The company Polenergia Biogaz Sp. z o.o. is focused on generation of power from biogas obtained from organic waste in industrial and agricultural biogas plants as well as the biogas obtained from degassing of landfill sites.</p> <p>Highlights:</p> <ul style="list-style-type: none"> • Market leader in the sector of dispersed energy generation from biogas. • Cooperates with the leading technology providers from Western Europe and Polish contractors. • Currently, the company is constructing three biogas plants with a total capacity of 5.2 MW. 	
<p>Direct connection with Biogas Market:</p> <p>The company Polskie Biogazownie "Energy Zalesie" Sp. z o.o. is an investor of an agricultural biogas plant in Zalesie</p> <p>The company plans to build a biogas plant in Żórawina, the investor is a Polish company Polskie Biogazownie "Energy-Żórawina" Sp. z o.o. a company belonging to the Polskie Biogazownie S.A.</p>	<p>Contact:</p> <p>Krucza 24/26 Str. 00-526 Warszawa Phone: 22 522 39 45 www.polenergia.pl</p>

<p>Name: Südzucker Polska S.A.</p> <p>Group: Developers</p>	
<p>Characteristics:</p> <p>Südzucker Polska S.A. is a member of the European Südzucker Group, the largest sugar producer in Europe. In the last few years, we have consolidated 22 sugar factories, which made it possible for us to modernise the business. At present, Südzucker Polska S.A. produces sugar at five sugar factories: Cerekiew, Ropczyce, Strzelin, Strzyżów and Świdnica.</p> <p>White sugar, sold under the well-known Cukier Królewski brand which has been appreciated by Polish consumers for 14 years now, is the Company's flagship product.</p>	
<p>Direct connection with Biogas Market:</p> <p>The company Südzucker Polska S.A. is an investor of an agricultural biogas plant in Strzelin.</p>	<p>Contact:</p> <p>Muchoborska 6 Str. 54-424 Wrocław Phone: 71 79 88 900 www.suedzucker.pl</p>

Name: DMG Sp. z o.o. Group: Developers	
Characteristics: The company DMG was established in 2007 and offers assistance with: <ul style="list-style-type: none"> • Providing advice during the planning and design of investment. • Advice in obtaining investment financing. • Obtaining the required documentation and the necessary analyzes. • Obtaining the recipient of the energy produced. • Start-up technology and operation. 	
Direct connection with Biogas Market: The company DMG Sp. z o.o. is an investor of an agricultural biogas plant in Koczergi near Parczew. The general contractor was the company UNISERV SA.	Contact: Koczergi 56B Str. 21-200 Parczew Phone: 60 495 96 53 http://dmg.net.pl/

Name: "BIO-POWER" Sp. z o.o. Group: Developers	
Characteristics: BIO POWER Company was incorporated on 23 February 2007. The registered office of the Company is the city of Zamosc. The strategic shareholder of the Company is an Austrian company NAHTEC GmbH in Lebring engaged in the design, construction and operation of biogas, bio-energy plants and heat plants using energy as a factor of various types of biomass. Designed and created dozens of such facilities in Austria and other countries.	
Direct connection with Biogas Market: The company "BIO-POWER" Sp. z o.o. is an investor of an agricultural biogas plant in Zaścianki. The general contractor was the company UNISERV SA.	Contact: Solna 3 Str. 22-400 Zamość Phone: 84 638 42 16 www.biopower.com.pl

Name: Cargill Poland Sp. z o.o. Group: Developers		
Characteristics: Cargill established its activities in Poland in 1991 when it opened an office in Warsaw to explore trading and investment opportunities following many years of trading grains, soybean meal and apple juice. Cargill has activities in the following areas in Poland: <ul style="list-style-type: none"> • Animal nutrition. • Production and sales of sweeteners. • Starches and starch derivatives. • Grain and oilseed trading. • Specialty texturizing ingredients. 		
Direct connection with Biogas Market: The company Cargill Poland Sp. z o.o. is an investor of an agricultural biogas plant in Bielany Wrocławskie.		Contact: Woloska 22 Str. 02-675 Warsaw Phone: 22 546 01 00 www.cargill.com.pl/en/index.jsp

Name: Biogazownia Rypin Sp. z o.o. Group: Developers		
Characteristics: The company designed and in 2013 built a biogas power plants in Rypin.		
Direct connection with Biogas Market: The company Biogazownia Rypin Sp. z o.o. is an investor of an agricultural biogas plant in Rypin.		Contact: Starorypin Prywatny 51 Str. 87-500 Rypin Phone: 54 233 71 15 www.biogazrypin.pl

Name: Minex-Invest Sp. z o.o. Group: Developers	 1949 GRUPA KAPITAŁOWA MINEX
Characteristics: The company designed and in 2012 built a biogas power plants in Łęguty. It is a type of biogas Navaro.	
Direct connection with Biogas Market: The company Minex-Invest Sp. z o.o. is an investor of an agricultural biogas plant in Łęguty. The general contractor was the company LimnoTec.	Contact: Chalubińskiego 8 Str. 00-613 Warsaw Phone: 22 830 05 00 www.minex-invest.com.pl

Name: "EKOENERGIA WKM" Sp. z o.o. Group: Developers	
Characteristics: The company designed and in 2013 built a biogas power plants in Orchówek.	
Direct connection with Biogas Market: The company "EKOENERGIA WKM" Sp. z o.o. is an investor of an agricultural biogas plant in Orchówek.	Contact: Garbarska 16 Str. 22-200 Włodawa Phone: 22 815 30 33

Name: Nadmorskie Elektrownie Wiatrowe
Darżyno Sp. z o.o.

Group: Developers



Characteristics:

Nadmorskie Elektrownie Wiatrowe Darżyno Sp. z o.o. operates in the renewable energy sector since 2001 year. The company was established as a special purpose vehicle for the implementation of the construction of the park wind farm consisting of three wind turbines Enercon E-82 with a rated power of 2 MW each.


Direct connection with Biogas Market:


The company Nadmorskie Elektrownie Wiatrowe Darżyno is an investor of an agricultural biogas plant in Darżyno.

Contact:


Łozy 21 Str.
80-516 Gdańsk
Phone: 583 440 505
www.newd.com.pl

<p>Name: Zakład Usługowo-Handlowy "Wojciechowski" Zdzisław Wojciechowski</p> <p>Group: Developers</p>	
<p>Characteristics:</p> <p>Zakład Usługowo-Handlowy "Wojciechowski" Bukowiec Opoczyński was established in 1990. Today it is one of the largest and most modern meat processing plants in the Lodz region. The scope of business includes the buying and slaughtering of pigs and cattle, processing and production of meat, making sausages and their distribution.</p> <p>The plant produces electricity and heat from biogas using slaughterhouse waste generated in the facility the Meat Processing. Engaged in the production of pellets from dried digestate masses and sales to the electricity grid and partial use of her own needs.</p>	
<p>Direct connection with Biogas Market:</p> <p>The company Zakład Usługowo-Handlowy "Wojciechowski" Zdzisław Wojciechowski is an investor of agricultural biogas plant in Sobawiny near Opoczno.</p>	<p>Contact:</p> <p>Sobawiny 7E 26-300 Opoczno Phone: 44 754 46 12 www.woy.pl</p>

Name: EL-KA Sp. z o.o. Group: Developers	
Characteristics: EL-KA Sp. z o.o. was founded in 2010 by Elizabeth and Kazimierz Chwiątek. The aim of the company is the production and sale of electricity from renewable sources. This is possible thanks to the biogas plant built in Byszewo.	
Direct connection with Biogas Market: The company EL-KA Sp. z o.o. is an investor of an agricultural biogas plant in Byszewo.	Contact: Byszewo 17 73-150 Łobez Phone: 60 229 97 89 http://elkabiogaz.hostil.pl

Name: BIOGAZ Przemysław "Łąkról" Sp. z o.o. Group: Developers	
Characteristics: The company conducts commercial activities in the Poland from 22 July 1996, working with the best producers of agricultural inputs. They have a wide range of products of chemical fertilizers, pesticides, agricultural machinery and equipment. The company is also buying and selling grain, has its own transport fleet to transport bulk cargo in bulk, and on pallets.	
Direct connection with Biogas Market: The company BIOGAZ Przemysław "Łąkról" Sp. z o.o. is and investor of an agricultural biogas plant in Przemysław.	Contact: Wiewiecko 36 c Str. 73-155 Węgorzyno Phone: 91 397 18 46 www.agromarketwiewiecko.pl

Name: FARM FRITES POLAND S.A. Group: Developers	
Characteristics: Farm Frites Poland SA (FFP) is one of the leading producers of frozen French fries in central and eastern Europe. It was established in 1993 as a joint venture of two Dutch potato processing producers: Farm Frites and Aviko. A factory was built and a line of French fries initiated in the autumn of 1994, within twelve months of the start of construction. The decision to locate the factory in Łęborg was influenced by the favorable climate and appropriate soil conditions classified as "First Zone for Healthy Potatoes". An added bonus was Łęborg authorities' positive approach to the venture which they recognized as a development opportunity for the town. Since 2008, FFP has been a member of European Potato Processors' Association (EUPPA) and Sustainable Agriculture Initiative (SAI) Platform.	
Direct connection with Biogas Market: The company FARM FRITES POLAND S.A. is an investor of an agricultural biogas plant in Łęborg.	Contact: Abrahama 13 Str. 84-300 Łęborg Phone: 59 862 91 00 www.ffp.pl/company


Name: PFEIFER & LANGEN GLINOJECK S.A. Group: Developers	
Characteristics: Pfeifer & Langen Polska S.A. and Pfeifer & Langen Glinojek S.A. are manufacturing companies. They operate the sugar factories. Pfeifer & Langen Marketing S.A. coordinates sales and distribution to private and industry customers of white sugar, cane sugar and a wide range of sugar products under the international DIAMANT brand (e.g. fine sugar, sugar cubes, icing sugar etc.).	
Direct connection with Biogas Market: The company Pfeifer & Langen Marketing S.A. is an investor of agricultural biogas plant in Glinojek.	Contact: Adama Mickiewicza 35 Str. 60-959 Poznań Phone: 23 675 01 00 www.diamant.pl/en


Name: Elektrownia Biogazowa "Borzęciczki" Sp. z o.o. Group: Developers	
Characteristics: Company ELEKTROWNIA BIOGAZOWA „BORZĘCICZKI” Sp. z o.o. started its business in 2009. The activities performed by the company is the production of fertilizers (phosphorus, gardening compost production).	
Direct connection with Biogas Market: The company Elektrownia Biogazowa "Borzęciczki" Sp. z o.o. is and investor of an agricultural biogas plant in Borzęciczki. Contractor's tanks was company Wolf System Sp. z o.o.	Contact: Borzęciczki 29 63-720 Koźmin Wielkopolski

Name: Agro Bio Sp. z o.o.	
Group: Developers	
Characteristics: The company designed and in 2013 built a biogas power plant in Sławkowo.	
Direct connection with Biogas Market: The company Agro Bio Sp. z o.o. is an investor of an agricultural biogas plant in Sławkowo.	Contact: Sławkowo 15 11-400 Kętrzyn

Name: "Eco-Progres" Sp. z o.o.	
Group: Developers	
Characteristics: The company designed and in 2013 built a biogas power plant in Gize. The company produces energy from renewable energy sources.	
Direct connection with Biogas Market: The company "Eco-Progres" Sp. z o.o. is and investor of an agricultural biogas plant in Gize.	Contact: Strefowa 7 Str. 19-300 Elk Phone: 87 620 15 30

Name: Ośrodek Hodowli Zarodowej "Gajewo" Sp. z o.o.	
Group: Developers	
Characteristics: Company is engaged in agriculture, cattle breeding and cultivation of cereals. The company designed and in 2012 built a biogas power plant in Tragamin.	
Direct connection with Biogas Market: The company Ośrodek Hodowli Zarodowej "Gajewo" Sp. z o.o. is an investor of an agricultural biogas plant in Tragamin near Malborka	Contact: Kładowo 2 Str. 82-200 Malbork Phone: 55 272 20 02

Name: ADLER BIOGAZ Sp. z o.o. Group: Developers	 ADLERBIOGAZ
Characteristics: Adler Biogas Company Sp. z o.o. built a biogas plant with a total capacity of two cogenerators 1,052 MW, resulting in a process that uses anaerobic digestion biogas for cogeneration of electricity and heat. The location of the biogas company ADLER BIOGAS in Ryboły determined mainly easy access to the substrates used for biogas production, access to the local electricity grid, proximity to heat consumers.	
Direct connection with Biogas Market: The company ADLER BIOGAZ Sp. z o.o is an investor of an agricultural biogas plant in Ryboły.	Contact: Szosa Baranowicka 62A Str. 15-521 Białystok - Zaścianki Phone: 85 741 86 50 www.adlerbiogaz.eu

Name: Instytut Zarządzania i Samorządności Sp. z o.o. Group: Developers	 INSTYTUT ZARZĄDZANIA I SAMORZĄDNOŚCI®
Characteristics: The Institute was established in 2003 in Wrocław. The company provides comprehensive services for projects; from the preparation of application documents, assistance in the implementation of public procurement through to settlement construction supervision of aid granted.	
Direct connection with Biogas Market: The company Instytut Zarządzania i Samorządności Sp. z o.o. is an investor of an agricultural biogas plant in Łagiewniki.	Contact: Boya-Żeleńskiego 24 Str. 51-160 Wrocław Phone: 71 323 09 11 www.institut.biz

Name: Biogaz Działyń Sp. z o.o.

Group: Developers



Characteristics:

Farm in Działyń was founded in 2000 on the basis of the transformation of the former state-farm agricultural conglomerate in Działyń the employee-owned company Działpol Sp. z o.o. Działpol Sp. z o.o. manages an area of approximately 1,500 hectares of agricultural land. The company provides sustainable farming based on the rational use of natural resources, thereby reducing the negative impact of agriculture on the environment.

The company's goal is to produce the highest quality milk, cereals, oilseed rape, maize while taking care of the preservation of the environment.




Direct connection with Biogas Market:

The company Biogaz Działyń Sp. z o.o. is an investor of an agricultural biogas plant in Działyń.


Construction of Agricultural Biogas plant in Działyń was supported by the National Fund for Environmental Protection and Water Management.


Contact:

Działyń 20 Str.
62-271 Działyń
Phone: 61 427 96 90
www.dzialpol.pl/biogaz.html

<p>Name: ETERON Sp. z o.o.</p> <p>Group: Developers</p>	
<p>Characteristics:</p> <p>Eteron Group is a group of companies undertaking biogas investments. Capital Group ETERON be Bioelektrownia Buczek and Bioelektrownia Szarlej whose projects are in progress.</p>	
<p>Direct connection with Biogas Market:</p> <p>1. The company Bioelektrownia Szarlej is building an agricultural biogas plant in Szarlej.</p>  <p>Bioelektrownia Szarlej Sp. z o.o. located in Kostrzyń, is the investor of the project "Biogas Power Plant Szarlej". The Biogas Plant is located in Szarlej, in the district of Kruszwica, in Kujawsko – Pomeranian province.</p> <p>The project is realized by the company Bioelektrownia Szarlej has a chance to become the largest biogas plant in Poland - planned electric power, as many as 3.2 MWe.</p> <p>2. The company Bioelektrownia Buczek is building an agricultural biogas plant in Buczek.</p>  <p>This is the first installation of this type, the project foresees the construction of sterilizing enables the preparation and utilization of slaughterhouse waste, which in addition to increasing energy efficiency will gain additional revenue from recycling.</p>	<p>Contact:</p> <p>Wrzesińska 1B Str. 62-025 Kostrzyn Phone: 61 818 89 82</p> <p>www.eteron.pl/</p> <p>https://sites.google.com/site/bioelektrowniaszarlej/</p> <p>http://bioelektrownia-buczek.pl/onas/</p>

Name: Tempo Sp. z o.o. Group: Developers	Tempo France SAS
Characteristics: <p>The priority objective of the company is to build modern biogas plants. TEMPO Sp z o.o. is energy company, performing both distribution networks and renewable energy sources.</p> <p>The range of works by electro-energy include:</p> <ul style="list-style-type: none"> • Construction of biogas plants. • Construction of energy. • Urban vision and signaling systems. • Sale of electricity. • Electrical Installations. • Control and automation of electrical equipment. • Telecommunication systems, network alarm monitoring. 	
Direct connection with Biogas Market: <p>The company is building an agricultural biogas plant in Kożanówce and in Przypisówka.</p> <p>Project implemented by Tempo Sp. z o.o. received funding under Action 9.1 of the Operational Programme Infrastructure and Environment.</p> <p>The general contractor was the company ENECO.</p>	Contact: Inżynierska 8 Str. 20-484 Lublin Phone: 81 441 70 97 www.tempo.eu.com

Name:	Polski Biogaz Sp. z o.o.	
Group:	Developers	
Characteristics:		
<p>Polski Biogas Sp. z o.o. was founded in 2005. At the moment, shareholders are Polish entities implementing capital investment projects in the broadly defined area of green investments. The Company was formed to carry out investment projects in the area of Renewable Energy Sources (RES) with particular emphasis on projects involving the construction of biogas plants in Poland.</p>		
Direct connection with Biogas Market:		Contact:
<p>The company is building an agricultural biogas plant in Czerkasy. The planned capacity is 1.5 MW. The Company has obtained financing for the investment of the National Fund for Environmental Protection and Water Management.</p>		<p>Nowogrodzka 47A Str. 00-695 Warszawa Phone: 22 585 09 12 http://polskibiogaz.com</p>

Name:	Bio K.K. Energia Sp. z o.o.	
Group:	Developers	
Characteristics:		
<p>Company BIO K. K. Energy was founded in March 2009 in order to build and operate the biogas plant with a capacity of 1 MW in the town of Nowe Borza in the district Pultuski. The technology that will be used in the construction of the biogas plant would provide electrical power and heat with substrates of agricultural origin. This technology involves drying digestate which is then processed into pellets.</p>		
Direct connection with Biogas Market:		Contact:
<p>The company is building an agricultural biogas plant in Nowe Borza. The Company has obtained financing for the investment of the National Fund for Environmental Protection and Water Management.</p>		<p>Garnowo Duże 60 Str. 06-420 Gołmin Phone: 79 865 90 82 www.biokkenergia.pl</p>

Name: Biogas East Sp. z o.o. Group: Developers	
Characteristics: The investor is building an agricultural biogas plant in Grochów Szlachecki in the province mazowieckie.	
Direct connection with Biogas Market: The company is building an agricultural biogas plant in Grochów Szlachecki. The planned capacity is 1 MW. The Company has obtained financing for the investment of the National Fund for Environmental Protection and Water Management.	Contact: Sokołowska 5 Str. 08-300 Sokołów Podlaski

Name: Gospodarstwo Rolne Biogaz T.Z. Śmiechowscy Sp. z o.o. Group: Developers	
Characteristics: The investor is building an agricultural biogas plant in Jaromierz, district Człuchów, in the province pomorskie.	
Direct connection with Biogas Market: The company is building an agricultural biogas plant in Jaromierz. Biogas project is implemented by the Gospodarstwo Rolne Biogaz T.S. Śmiechowscy Sp. z o.o. and received funding from the National Fund for Environmental Protection and Water Management.	Contact: Jaromierz 3b Str. 77-300 Człuchów Phone: 59 834 21 93 http://biogaz-smiechowscy.pl

Name: Agroelektrogaz Sp. z o.o.

Group: Developers



Characteristics:

AgroElektroGaz Company was established in order to build a biogas installations in the use of agricultural feedstock and organic residues to produce electricity and heat. Currently, work is underway on the construction of the first two installations in the zachodniopomorskie province with a capacity of 1 MW and 1.6 MW.

Substrates which are used:

- Installation No. 1 (1 MW): manure, corn silage energy
- Installation No. 2 (1.6 MW): straw, catering waste, fish waste, grease separator, corn silage energy, sewage sludge.

Direct connection with Biogas Market:

The company is building an agricultural biogas plant in Drzonowo.

The project received funding under Action 9.4 of the Operational Programme Infrastructure and Environment. The planned capacity is 1 MW. The general contractor was the company LimnoTec.

Contact:


Opaczewska 43 Str.


02-201 Warszawa

Phone: 50 272 43 95


www.agroelektrogaz.pl/?d=5

3.5 CONSTRUCTORS AND TECHNOLOGY PROVIDERS

Name: TUGEB POLBUD Sp. z o.o. Group: Constructors and Technology Providers	
Characteristics: <p>Company Tugeb-Polbud based on modern, proven technology from foreign companies, while his own execution, is prepared to provide comprehensive service clients interested in the construction of biogas plants.</p> <p>In collaboration company offers:</p> <ul style="list-style-type: none"> • Advising on the stage of the investment decision-making in the construction of biogas plants, selection of the size of the investment and the structure of the substrates in order to increase the efficiency of the biogas plant. • Tanks for biogas reinforced concrete, monolithic and steel. <p>The company offers a comprehensive biogas production using the wet and dry, depending on the origin and nature of the treated waste.</p>	
Direct connection with Biogas Market: <p>The company TUGEB POLBUD Sp. z o.o. is an contractor of an agricultural biogas plant in Melno.</p>	Contact: Sławoszowice Kolejowa 7 Str. 56-300 Milicz Phone: 71 38 31 511 www.tugeb-polbud.com.pl

<p>Name: ELTECO POLAND Sp. z o. o.</p> <p>Group: Constructors and Technology Providers</p>	
<p>Characteristics:</p> <p>ELTECO POLAND Sp. z o.o. is a subsidiary company of the Slovak ELTECO S.A. specializing in the production:</p> <ul style="list-style-type: none"> • Cogeneration systems - devices for combined production of electricity and heat. • Equipment and power supply (power supply units and UPS backup). <p>ELTECO S.A. has its own center for research - development, production facility and a division installers - service. ELTECO S.A. also has offices in the Czech Republic, Russia, Ukraine, Belarus and Kazakhstan. The company provides complete power systems with the ability to fully control and monitoring parameters through all currently deployed communication systems.</p>	
<p>Direct connection with Biogas Market:</p> <p>In cooperation with the company ALLTER POWER, investor agricultural biogas plant and distillery in Melno, was built a modern and environmentally friendly installation using high-efficiency cogeneration, which combines production of electricity and heat from biogas farm with their effective use in the distillery.</p> <p>ELTECO POLAND designed, delivered and installed:</p> <ul style="list-style-type: none"> • 4 cogeneration units ELTECO PETRA 500C with the power of 400kW each. • Transformer station of the measurement system produced green energy. • Complete installation of heat along with the measuring device (manufactured heat in the form of hot water and steam is managed in the needs of the distillery). 	<p>Contact:</p> <p>Pilotów 2 Str. 31-462 Kraków Phone: 12 623 33 00 www.elteco.pl</p>

<p>Name: UNISERV S.A.</p> <p>Group: Constructors and Technology Providers</p>	
<p>Characteristics:</p> <p>UNISERV is an engineering company which offers complete delivery as well as repair and refurbishment works of cooling towers and industrial chimneys, starting each project with technical design going through the execution, start-up and final handover.</p> <p>The company assets:</p> <ul style="list-style-type: none"> • Modern engineering solutions. • Incorporated design office. • Own technology used for constructing chimney or cooling tower shell. • Own cooling technology. • Qualified workforce. • Ten years of experience. <p>UNISERV Budownictwo Przemysłowe S.A. is a leading company in designing, erecting and modernizing industrial chimneys and cooling towers on domestic market. Additionally, scope of services includes industrial furnaces, quenching towers, storage silos and other industrial constructions.</p>	
<p>Direct connection with Biogas Market:</p> <p>Construction and assembly of biogas station for agricultural materials in Zaścianki, Międzyrzec Podlaski for Bio - Power Sp. z o.o. and preparation of detailed design documentation and as-built documentation.</p> <p>General contractor in the implementation of tasks under the name: "Biogas Koczergi".</p>	<p>Contact:</p> <p>Woźniaka 7A Str. 40-337 Katowice Phone: 32 35 99 100 www.uniserv.com.pl</p>

<p>Name: Better Energy Sp. z o.o.</p> <p>Group: Constructors and Technology Providers</p>	
<p>Characteristics:</p> <p>The company offers comprehensive preparation of any project associated with the creation of biogas plants, wind power plants, water. The leading company specializing in the design, technology selection, construction of biogas plants as well as their technological and biological disturbances.</p> <p>The company is engaged in the implementation of biogas plants based on biogas technology worked on substrates of vegetable and animal (Navaro). The technology is developed by a team of experienced professionals Better-Energy and is Polish product.</p>	
<p>Direct connection with Biogas Market:</p> <p>On 12 March 2013 the company Better-Energy has signed a contract with the Instytut Zarządzania i Samorządności Sp. z o.o. for the construction of biogas plants in Łagiewniki for the production of electricity" co-financed by the European Union from the European Regional Development Fund under the Regional Operational Programme of Dolnośląskie province in 2007-2013, Priority 5" Regional Environmentally friendly energy infrastructure ("Energy").</p> <p>Scope of work:</p> <ul style="list-style-type: none"> • Execution of the complete installation AKPiA. • Performing Installation of condensate. • Construction of exterior energy input. • Execution of external networks biogas. • Execution of external networks heat. • Implementation of the heating system tanks. • Implementation of process heat distributor. • Implementation of biological desulphurisation. • Commissioning of biogas plants. 	<p>Contact:</p> <p>Lotnicza 100 Str. 54-133 Wrocław Phone: 71 359 93 51 www.better-energy.pl</p>

Name: SH+E POLSKA Sp. z o.o.

Group: Constructors and Technology
Providers



Characteristics:

Company LimnoTec GmbH within the group the SH + E POLAND Sp. z o.o. obtaining bio-energy for individual, municipal or agricultural purposes through innovative processes combined with the highest possible flexibility and optimization of all material (sewage, water, substrates digestate).

Company LimnoTec GmbH is a partner from the choice of location, procedures for obtaining permits and financing.

Direct connection with Biogas Market:

The company since 2006 has participated on a number of investments related to biogas plants including:

- Comprehensive construction of biogas.
- Repairs cogeneration units.
- Supply and installation of cogeneration units.
- Modernization and optimization of existing installations.
- Installation restoration.

At present, the company LimnoTec GmbH, in Poland implemented two projects:

- Construction of biogas plants Łeguty with an installed capacity 1000kW.
- Construction of biogas plants Drzonowo with an installed capacity 1000kW.

Contact:

Aleja Kraśnicka 25
20-718 Lublin
Phone: 81 745 20 70
www.she-polska.pl

Name: Automatech Sp. z o.o.

Group: Constructors and Technology
Providers



Characteristics:

Automatech is a Polish, specialist engineering company operating in industrial automation for over 20 years. This leads both sales of components and a wide range of professional engineering services.

Performs runs applications and solutions such as:

Vision quality control position


- Telemetric measurement and monitoring of energy consumption and other parameters in the plant.
- Safety audits of machines.
- Adapting to the requirements of the EU machinery for safety.
- Design and implementation of control cabinets.
- Laser Marking position.
- Building control systems.
- Other specific technical solutions developed for industrial plants.

Direct connection with Biogas Market:

The company offers design, construction and implementation of industrial automation systems in biogas plants.

Contact:

Ewy 2 Str.
05-816 Opacz - Kolonia
Phone: 22 753 24 80
www.automatech.pl

Name: Conex Sp. z o. o. Group: Constructors and Technology Providers	
Characteristics: <p>Conex Sp. z oo was established with a view to supporting the implementation of projects on the Renewable Energy Sources (RES) market. The company specializes in projects related with the formation of biogas plants, solar energy photovoltaic installations and investments of municipal waste management. The implementation of projects combines extensive expertise in various fields, such as awareness of environmental issues, specific know-how and engineering, legal and financial expertise and skills in acquiring local partners.</p>	
Direct connection with Biogas Market: <p>The range of services offered by the company Conex includes:</p> <ul style="list-style-type: none"> • The initial verification capabilities to locate plants in the area, including: <ul style="list-style-type: none"> - analysis of the possibility of obtaining substrates, - analysis of technological options, - preliminary analysis of cost-effectiveness, - feasibility study (for large biogas plants). • Preparation of legal and organizational design. • Funding of preparatory work. • Project management. • Operatorship - within the service company takes care of the proper functioning and operation of the system. 	Contact: Al. Jerozolimskie 65/79 00-697 Warszawa Phone: 22 630 66 10 http://conex-oze.pl

Name: BIOGAS - HOCHREITER EU
**Group: Constructors and
Technology Providers**

Characteristics:

BIOGAS-HOCHREITER EU s.r.o. offers complete key-turn delivery of biogas production facilities. The company offers feasibility studies, assistance with financing and regulatory approvals, biogas facility design and construction, assembly of BIOGAS-HOCHREITER technology, delivery of Hochreiter dosing machines, of Deutz or Mann combustion engines for cogeneration process and Hochreiter mixing machines, assistance with the start-up and optimization of the biogas facility to ensure efficient operation.

The company delivers biogas plants powered by BIOGAS-HOCHREITER technology ranging in size from 25 kW up to huge installations of 2MW and more. They can satisfy not only large agricultural companies, but also small farms.

Direct connection with Biogas Market:

The company BIOGAS-Hochreiter EU is responsible for providing the technology to build a biogas plant in Klępsku. The project involves the construction of biogas plants with an installed capacity of 1 MW of electricity.

Construction of biogas plants in Klępsk began at the end of 2010.

Contact:

P. Stalmacha 21
40-058 Katowice
Phone: 51 512 00 63
www.biogas-hochreiter.eu

Name: Biowatt S.A.

Group: Constructors and Technology Providers
Characteristics:

The company offers Biowatt biogas plants, which are characterized by high efficiency biogas yield and technological advancement. Responsible for the proper construction and commissioning of the biogas plant, and for its smooth functioning. Offered biogas plants determine the highest standards of quality confirmed by numerous certificates and over 110 active installations.

Biowatt S.A. comprehensively implement biogas projects based on individual approach to each biogas project. The range of services includes:

- Planning of the economic and technological concept.
- Designing a biogas plant.
- Construction of biogas plants key-turn and the launch of a biogas plant.

Direct connection with Biogas Market:

Examples of biogas projects executed by the company:

- First agricultural biogas plant (500kWe) construction project located in Lublin Province along with obtaining a building permit.
- Second agricultural biogas plant (999 kWe) construction project located in the Łódź Province.
- Third agricultural biogas plant (500 kWe) construction project located in Lublin Province along with obtaining a building permit.

Contact:

Garbary 102 str.
61-757 Poznań
Phone: 61 855 35 90
www.biowatt.pl

Name: DECO CLEANENERGY
**Group: Constructors and
Technology Providers**

Characteristics:

DECO CleanEnergy offers a wide range of services in the sector of renewable energy sources (RES), in particular the construction of biogas plants. The company provides consultancy on the stage of decision-making, preparation of documentation, including environmental reports, plans, land development, construction projects, construction permits, and construction, commissioning, operation of biogas plants, and the supervision of methane fermentation process in the built facility.

Basic services performed by DECO CleanEnergy:

- Advice on the construction and operation of biogas plants.
- Advising on the financing of biogas plants.
- Preparation of the necessary documentation, feasibility studies, environmental reports.
- Design of biogas plants.
- Obtaining administrative decisions related to construction and operation of biogas plants.
- Construction of key-turn biogas plants.
- Launch of biogas plants.
- Operation and maintenance of plant.

Direct connection with Biogas Market:

The company operates on the Polish market in the industry related to the biogas plants since 2008. Throughout Europe with its participation have been built about 70 installations producing biogas. These are the complete biogas plants with capacities from 50kW to 1000kW.

Contact:

Petrażyckiego 22 Str.
52-419 Wrocław
Phone: 71 364 32 83
<http://biogazplant.pl>

Name: Wolf System Sp. z o.o.
Group: Constructors and Technology Providers

Characteristics:

Wolf system is one of the largest European manufacturers of monolithic reinforced concrete tanks and silos for liquids and powders. For more than 45 years in 18 European countries builds them annually about 6,000 units. In Poland, Wolf System Sp. z o.o. running since 1990 and has to his credit several thousand built reference objects.

Offered tanks and silos are used in agriculture (manure tanks, grain, corn), industry (wastewater treatment plants, water tanks and sawdust) and in the process of energy production from biomass.

Performed monolithic reinforced concrete tanks are constructed based on the latest European standards for concrete, cement and based on static calculations for individual tanks.

Direct connection with Biogas Market:

Wolf System is a performer of many projects related to biogas plants in Poland. Built its facilities include:

- Fermentation tank with suspended.
- Open container - Biogas chamber.
- Open container - Warehouse Material digestate.
- Slurry tank with suspended.

at such facilities as:

- Biogas plant in Kostkowice.
- Biogas plant in Skrzatusz.
- Biogas plant in Łany Wielkie.

Contact:

Budowlana 17 Str.
41-100 Siemianowice Śląskie
Phone: 32 605 37 00
www.wolfssystem.pl

Name: KWE - Technika Energetyczna
Group: Constructors and Technology Providers



Characteristics:

KWE-Technika Energetyczna Sp. z o.o. company founded in 1999 is a leading company in Poland in cogeneration and gas engine solutions. From the very start, KWE implemented pioneer technological solutions based on coordinated electricity and heat production. Since 2000, KWE has been the authorized Distributor & Service Provider of GE Jenbacher gas engines in Poland. From April 2010, KWE is part of Gruppo AB an Italian company, leader in Europe in industrial solutions for cogeneration.

The company offers include:

- Cogeneration modules.
- Cogeneration electrical components.
- Heat exchangers, coolers, emergency, silencers, fully equipped with thermal circuits.
- Supervisory and control systems for both cogeneration equipment as well as manufacturing processes, closely related to cogeneration.

Direct connection with Biogas Market:

Industrial natural gas cogeneration, centered firstly on energy efficiency and economic saving and biogas cogeneration, which is mainly for farms wanting to invest in the valorization process of crops and/or livestock wastes and become real energy producers. Always in this field of operation, the KWE also caters for the needs of municipalised companies, consortiums and institutions for the effective and sustainable use of the biogas produced on landfills.

Contact:

Miedziana 38 Str.
43-305 Bielsko Biala
Phone: 33 821 65 62
www.kwe.pl

4 CONCLUSIONS

Investments in agricultural biogas plants and biogas plants, still meets many obstacles in Poland. There are also typical barriers for other investments and, therefore, associated with legal, social circumstances and problems of financing. Accelerate the development of agricultural biogas plants should consist of removing these barriers and selection of appropriate economic instruments that influence the formation of research facilities and scientific, technical and market services related to biogas installations.

Initially, agricultural biogas plants in Poland has been built by method of “learning – by – doing”, which is to learn by doing, without access to explicit closer to technology and professional knowledge of biochemical processes. The result was the occurrence of such action, in addition to lower capital expenditures, including the real risks associated with limited performance as implemented biogas systems. Relevant regulations and the possibility of downloading investment loans, with time allowed the use of developed and proven technologies (eg.: Germany, Austria). At present, Poland has many native and experienced companies offering to build a biogas plants. Biogas plants locations dictated primarily by access to suitable substrates. Initially, agricultural biogas plants has been built mostly with large livestock farms, mainly due to access significant amounts of manure and silage corn. There is currently an investor preferences change, especially when talking about the implementation of larger systems, for the location of the biogas plant food processing (sugar mills, distilleries, slaughterhouses, meat processing plants, fruit and vegetables, and dairy). The reason for this approach is the ability to regularly acquire low-cost, waste substrate, as well as year-round guarantee receipt produced in co-generation of heat by the factory, which is crucial for the economics of the project [2].

5 LITERATURE

Widely available information was used in the present project's compilation (from the companies' websites, public information bulletins of offices, etc.).

- [1] BioAlians doradztwo inwestycyjne; "Biogas 2012. The market of agricultural biogas plants in Poland." Warsaw 2013.
- [2] Pilarski K., Pilarska A.: Perspectives and Problems of Agricultural Biogas Plants Development in Poland. Technika Rolnicza Ogrodnicza Lesna, 2013, no 4.

6 APPENDIXES

Appendix 1. "Directions of development of agricultural biogas plants in Poland in the years 2010-2020".

Appendix 2. "Energy Policy of Poland until 2030".

Appendix 3. "Green Investment Scheme – Part 2: Agriculture Biogas Plants".

Appendix 1

"Directions of development of
agricultural biogas plants in
Poland in the years 2010-2020"



MINISTRY OF THE ECONOMY

**Directions of development for agricultural biogas plants in
Poland between 2010-2020**

**Document prepared in cooperation with
Ministry of Agriculture and Rural Development**

Document accepted by the Council of Ministers on 13th July, 2010

Warsaw, 2010

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1. Goal of the document

The hereby document refers to the postulates raised on the necessity for establishing of a system promoting and supporting the manufacturing of agricultural biogas and its application for the production of electricity and heat. The goal of “Directions of development of agricultural biogas plants in Poland between 2010-2020” further referred to as the “Directions” is: The creation of optimal conditions for the development of installations manufacturing agricultural biogas (the report indicates legal changes, which should be made in the Polish legal system, in order to optimize the construction processes of biogas installations); indication of the possibility for cofounding of these types of installations from public assets (national as well as those of the European Union – this document is not intended to create the funds, but rather indicates the existing budget instruments) as well as the performance of appropriate educational and promotional activities in the scope of constructing and using of agricultural biogas plants. The implementation of the Directions is a necessary element of the process leading up to the creation by year 2020 of one agricultural biogas plant per each commune, making use of the agricultural biomass, with the assumption that the commune possesses the appropriate conditions for the initiation of such an undertaking. It is forecasted that the biogas plants will be created in those communes with large areas of farm land from which biomass may be generated, which constitutes a type of harmonization of the state’s national priorities with those of the European Union’s Common Agricultural Policy.

The method of utilizing of agricultural biogas is dependent on multiple factors characteristic to the location of the individual investments (distance from the distribution networks, overall and local demand for electricity or heat, etc.). It is for this reason that the Directions do not determine the minimum or the maximum capacity of the biogas facilities to be installed as well as the method of utilizing the generated agricultural biogas (purification of the gas, supplying it to the network, generating of electricity and/or heat). The Directions do not specify the conditions, goals and directions for the development in the social, economic, regional and spatial areas as well as they do not refer to the regional development and the spatial development. These decisions remain within the scope of the investors managing the individual investments.

The Priority for matters connected with the renewable energy sector has found an expression in the form of the “Poland’s energy policy until 2030” adapted by the Council of Ministers on 10th November 2009. One of the main goals of the energy policy within this area is the growth of the share of renewable energy in the final energy consumption to the level of at least 15% as well as up to 10% within the transport fuels market, by year 2020. The executive activities program for the years 2009-2012 which constitutes an annex to “Poland’s energy policy until 2030” contains the concrete activities targeted at achieving of the above established goals. A significant part of them is related to the implementation of the Directive 2009/28/EC of the European Parliament and of the Council of 23rd April 2009 on the *promoting of the use of energy from renewable sources, amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC* (Journal of Laws of the EU L 140 from 5.6.2009, pages 16-62.). Directions, in accordance with the *Declaration on Green Growth* adopted on 25th June 2009 at the meeting of the Minister – members of the Organization for Economic Co-operation and Development (OECD) are an element of promoting of a more ecological economic growth, a positive influence on the development of using renewable energy sources as well as the reduction of green house gas emissions. Furthermore, the realization of the activities contained within the Directions may increase the rate of Poland’s economic growth (weakened in the recent period by the global economic and financial crisis).

2. Forecasted effects

The realization of the established goals will allow for the:

- a) improvement of the nation’s energy security through the increase of the energy supply based on renewable energy sources generated from the nation’s own raw materials;
- b) basing of a significant part of the gas supply, electricity and heat and agricultural biogas such as a transport fuel for many local biogas plants which will in turn allow for the delivery of agricultural biogas at quality levels equal to natural gas for the inhabitants of villages and small towns as well as to economic entities;
- c) generation of so-called local added value networks, among others by way of economic animation of the rural areas as well as by an increase in the employment among the rural population and economic entities of the farming industry and those connected with the renewable energy production (green jobs);

- d) stimulation of the development of local initiative connected with usage of locally generated heat;
- e) improvement of the energy infrastructure and increase in the competitiveness of the Polish agriculture (so-called distributed energy infrastructure);
- f) generation of significant volumes of electricity and heat from raw materials not in direct competition with the food industry, categorized as by-products of agriculture and waste from the agricultural and food industry;
- g) utilization of the potential of the environmentally-friendly agriculture in areas of Natura 2000 for the development of renewable energy source usage;
- h) increase in own income for local governments;
- i) obtaining of significant quantities of high quality environmentally-friendly organic fertilizers in the form of post-fermentation remainders from an agricultural substrate in the form of a granulated product;
- j) use of organic wastes which emit green-house gasses in to the environment, for energy production.

3. The Document's addressees

The Directions are directed at the:

- a) government and self-government administrative bodies responsible for the creation of stable conditions for the delivery of electricity and heat in quantities and at quality levels expected by recipients as well as for the development of distributed energy generation;
- b) recipients of energy including:
 - households,
 - farmers and agricultural producers,
 - public utility enterprises,
 - economic entities;
- c) suppliers of energy-generating raw materials as well as producers and distributors of electricity and heat including:
 - farmers and agricultural producers,

- entities interested in investing in plants generating agricultural biogas,
 - regional energy agencies,
 - network distributors of gas and electricity as well as heat;
- d) private financial sector;
- e) organizations and associations operating in branches of business included in the Directions.

4. Biogas' energy-generating potential

The opportunity for the development of the use of agricultural biogas in Poland is significant due to the large energy-generating potential of the national agriculture. The theoretical raw material potential is estimated at the capability of generating of 5 billion m³ of biogas¹. This potential assumes the utilization in first order, the by-products of agriculture, liquid and solid animal wastes and by-products and remainders from the agricultural and food industry. At the same time, along with the utilization of these raw materials, it is foreseeable to the cultivate plants, designated as energy-generating, for the purpose of manufacturing a substrate for the biogas plants. It is possible to ultimately achieve approximately 700 thousand hectares which will allow for the full securing of national food requirements as well as the obtaining of additional raw materials necessary for the generation of biofuels and agricultural biogas.

The realistically available raw material potential for the production of biogas in the by-products of agriculture and the agricultural and food industry amounts to approximately 1,7 billion m³ of biogas per annum. Poland's annual consumption amounts to 14 billion m³ of natural gas including individual consumers from rural areas who use approximately 500 million m³ of gas. The estimated volume of biogas after purification could cover approximately 10% of the national requirement for gas or completely cover the needs of the consumers in rural areas while supplying additionally 125 thousand MWh_e (electricity) and 200 thousand MWh_{th} (heat).

The estimates of the national agricultural energy potential included the changes resultant from the development of residential housing, services and industrial production as well as those of the transport infrastructure. The estimates assumed that the increase of the demand will

¹ This information has been supplied by the Ministry of Agriculture and Rural Development

naturally generate an increase in supply (in the case of production and the supplying of energy-generating raw materials).

It is also important to note that the increase in the utilisation of agricultural biogas generated by way of agricultural by-products, liquid and solid animal wastes and remainders from the agricultural and food industry will have an effect on the increase of the farmers' incomes of by way of utilizing of until-now unmanaged waste products and allow for the maintaining of agriculture's main function which is the production of food.

The utilization of the above-mentioned potential energy-generating remainders for the production of the agricultural biogas, will effectively protect the environment from contamination. The biogas generating process uses substrates which may not be utilized by other means or would otherwise generate problems with their utilization or could generate a threat to the environment during storage (swine manure). Their utilization for the production of agricultural biogas solves the problem of organic wastes and at the same time allows for obtaining of large amounts of high-quality environmentally-friendly organic fertilizers in the form of post-fermentation remainders from an agricultural substrate in the form of a granulated product.

Taking into account additionally the „Forecast for the fuel and energy demand until 2030” constituting Annex No 2 to „Poland's Energy Policy until 2030” in the scope of requirements for final gross energy from biogas in the generation of electricity and heat in 2020 in the amount of 850 ktoe, the amounts of CO₂ emissions avoided in connection with the generation of electricity and heat from fossil fuels is estimated at 3 400 000 tons per annum.

5. Cost of the realization of the Directions

Activities directed at achieving of the hereby Document's goals may be viewed, above all, from the point of economics. The investment input necessary for the construction of a single biogas plant (together with the installation used for purifying the agricultural biogas) with an estimated capacity of 1 MW_{el}, generating annually 3,5 – 3,8 million m³ of agricultural biogas (with a methane content of between 52% and 60%) constituting the equivalent of 2,5 million m³ of biogas with quality parameters equal to that of high-methane natural gas (a methane content of 98%), are estimated at approximately 10 – 15 million PLN. The above indicates that the investments in agricultural biogas located nationwide, possessing the generating potential of 1 billion m³ of agricultural biogas per annum, with quality parameters equal to

that of high-methane natural gas, require the investment in the amount of 4 - 6 billion PLN. The method of utilizing of the generated agricultural biogas, whether input into the national gas distribution network, the industrial-distribution gas network administrated by local governments or generation of electricity or heat, remains in the scope of the investors.

The assumption of the public assistance (e.g. from the structural funds with taking into account the applied regional or national public aid) at the level of 50% of qualified investment costs, represents the requirement for such funds at the level of approximately 2 – 3 billion PLN. The assumption of the above general validity of the installed capacity, represents the need for the appropriate increase of the necessary investment and means for support. The cost analysis indicates that the investments based on more refined Technologies (e.g. a closed circuit water supply, post-fermentation substrate remainders – processed into granulated organic fertilizers), as well as taking into account the derivative costs of the project (e.g. expenditures for the connecting of the agricultural biogas plants to grid or the national gas distribution network) may increase the total costs for the investment by approximately 15 – 20%.

The operational time of the agricultural biogas generating devices amounts to 95% per annum (with the efficiency of co-generating devices at 80%²).

It is estimated that the annual return on investment on agricultural biogas plant, amounts to approximately 15% (with the assumption of the complete sale to external entities of the electricity and heat or the transferring to the gas network of enriched agricultural biogas with the right to obtain the appropriate certifications for energy originating from renewable resources) which gives an average 7 - 9 year return period from the total investment of capital.

6. Mechanisms for the realization of goals

The quick development of agricultural biogas plants as well as the possibility of using agricultural biogas is limited by a number of barriers constituting a combination of factors which are psychological, social, institutional, legal and economic in nature. The development of agricultural biogas plants will be based mainly on the removal of these institutional and legal barriers and the appropriately selected economic stimuli which will influence the

² Information concerning the program's costs of realization has been provided by the Ministry of Agriculture and Rural Development

creation of the services market as well as the technical capability for biogas installations. The supply of this type of energy fuel, generated in agricultural biogas plants for gas distribution networks is a convincing element on the part of the economic and ecological effects connected with the limiting of losses occurring on the processing of gas into electricity and heat as well as on the side permitting the supply of this fuel to, among others, households in the countryside and in small towns where such possibility did not exist earlier.

6.1. Generation of favourable conditions for research on development of biogas manufacturing technologies

The manufacturing of agricultural biogas is characterized by different levels of development, a large scope in terms installed capacity, its efficiency, output levels and the frequency of failure of the equipment along with significant variations in the amounts of investment expenditures. An important element conditioning the successful development of biogas installation is their dependability and high level of the efficiency of microbiological processes taking place in the bioreactors. It is for this reason that the support of science is required in the scope of research and demonstrative programs connected with the implementation of new techniques and technologies used for manufacturing of agricultural biogas. This is especially important in terms of the modification of national scientific and research priorities and adjusting them to the directions of the scientific developments. An important element will be the realization of research tasks in the scope of the Strategic program for scientific and development activities entitled „Advanced technologies for energy generation” lead by the National Research and Development Centre. The highest priority of the above-mentioned program is the development of technological solutions, the implementation of which will aid in the achievement of the European Union’s goals of the 3x20 climate and energy package.

Additionally, the development of the technical and technological processes should be included in the:

- a) improvement of the methane fermentation;
- b) improvements in the manufacturing of biogas from different types of agriculturally based substrates;
- c) improvement in the methods of obtaining post-fermentation products;
- d) improvement in the monitoring of fermentation parameters taking place in the fermentation tanks;
- e) improvement of technology for conversion of biogas into electricity and heat;

- f) improvement of the purification process of biogas into bio-methane;
- g) improvement of a number of computer technologies in the area of optimization, supervision and stabilization of the biogas plant's entire process.

6.2. Legal alterations

Solutions intended to improve the development processes for the utilization of renewable energy sources, including agricultural biogas plants were contained in the Act from the 8th January 2010 on the amendments to the Act – Energy law and on amendments to other Acts (Journal of Laws No 21, item 104). The Act forecasts, among others the stipulation of the legal basis and the conditions for connecting to the gas distribution network of agricultural biogas plant installations by the energy-producing companies dealing with the transfer or the distribution of gas fuels. This Act included an instrument for assistance in the form of correlating the system of agricultural biogas promotion with the existing system of certifications originating from electricity generated by the renewable energy sources which will certainly become a significant stimuli for potential investors for the realization of undertakings in the scope of constructing biogas plants. The agricultural biogas purified to the quality parameters of the high-methane natural gas or nitrated gas will be pumped into the distribution and local installation networks from the initiatives of the local governments. At the same time, the Act foresees the introduction of regulations, on the basis of which, economic activity within the scope of manufacturing of agricultural biogas or electricity from agricultural biogas, will be performed on the basis of an entry into the register of energy-generating enterprises dealing with the production of agricultural biogas. The body operating the register as well as responsible for monitoring and verifying of energy-producing enterprises dealing with the manufacturing of agricultural biogas will be the President of the Agricultural Market Agency.

Keeping in mind the regulations concerning the connecting of biogas plants to the grid, the Act includes among others:

- the introduction of a deposit for payment for connecting to the network. The necessity of introducing such a solution has been caused by the speculative reservations of locations and connection power ratings within the grid. The introduction into the Act of the duty to bring in a deposit for the payment for connecting to the network, should

allow for the partial freeing up of a part of the connecting power ratings and limit this unfavourable effect in the future;

- disciplining the network entities to obey the deadlines for issuing of conditions for connecting to the network. For the failure to keep to said deadlines, a monetary fine will be issued in the amount of at least 3000 PLN per each day of delay;
- The assurance of full transparency of the process of connecting to the grid by way of the fact that the enterprises dealing with the transfer or the distribution of electricity will be obligated to assure full public availability of information, including among others: Information on entities applying for a connection, the location of the connection and the connection power rating as well as the dates of issuing of the conditions for the connection.

An obstacle however which the investors planning the construction of a biogas installation still come cross, are the unfavourable legal acts which dictate the legal and administrative procedures connected with the implementation of technologies and location of the installations making use of renewable sources of energy. The necessary changes in the legal regulations necessary for the effective realization of goals stipulated in the Directions, include:

- a) The issuing of an executive act in the scope of, among others, quality parameters of agricultural biogas introduced into the gas distribution network as well as the recalculation of the generated agricultural biogas into the equivalent of electricity generated from renewable energy sources, as resultant from the entries of the Act from 8th January 2010 on the amendment to the Act – *Energy law and on amendments to other acts* (Journal of Laws No. 21, item 104);
- b) In connection with the obligation to implement into the national legal system of the Directive 2008/98/EC of the European Parliament and of the Council of 19th November 2008 *on wastes and repealing certain Directives*, introduction of appropriate regulations in the scope of waste management while taking into account the need for development of agricultural biogas plants in Poland, which will constitute an element of the legislative process of specific legal acts in this scope;
- c) Amendment to the decree of the Minister of Food and Agriculture from the 7th October 1997 - *in the case of technical requirements which should be met by agricultural structures and their location* (Journal of Laws No. 132, item 887 as well

as from 2009, No 108, item 907) in the scope of specifying regulations relating to biogas plants;

- d) The amendment to the decree of the Council of Minister from the 24th December 2007 – *in the case of the Polish Classification of Economic Activities (PKD)* (Journal of Laws No. 251, item 1885 as well as from 2009, No 59, item 489) in order to assume the activity of biogas production;
- e) In connection with the obligation to implement into the national legal system of the Directive 2009/28/EC of the European Parliament and of the Council of 23rd April 2009 on the *promoting of the use of energy from renewable sources, amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC*, taking into account the introduction of changes to the tools connected with the financial assistance for development of renewable energy production in Poland, which will constitute an element of the legislative process of specific legal acts in this scope;
- f) The introduction of amendments to the Act from the 10th July 2007 *concerning fertilizers and fertilization* (Journal of Laws No. 147, item 1033) in this scope:
 - The limitation of the obligation of approval by the Regional Chemical-Agricultural Stations for fertilization plans where the post-fermentation remainders resultant from agricultural biogas plants will be utilized.
 - The broadening of the definition of natural fertilizers to include the processed and unprocessed products generated in agricultural biogas plants in the processes of biomass methane fermentation;
- g) Stabilization of solutions in the scope of administrative procedures on the location of biogas investments;
- h) The consideration of introducing amendments to the Act from the 21st August 1997 *concerning estate management* (Journal of Laws from 2004, No. 261, item 2603 with further amendments) as well as the Act from the 27th March 2003 *concerning spatial management and planning* (Journal of Laws No. 80, item 717 with further amendments) in order to significantly hasten the recreation the generation capacity, generation of new energy sources, including renewable ones;

The goal of this activity is the broadening of the catalogue of the public goal for investment based on constructing of renewable sources of energy, thereby generating optimal conditions for the development of distributed energy generation based on

locally available raw materials. Additionally, the updating of the above mentioned regulations may facilitate the ordering of planning processes connected with the construction of the energy infrastructure, including renewable sources of energy.

- i) The adoption of standardized solutions concerning the fire protection and blast-proofing in agricultural biogas plants:
- in the decree of the Council of Ministers from 9th November 2004 *in the case of stipulating the types of undertakings with potential for significantly affecting the environment and specific conditions connected with the qualifying of such undertakings, for the generation of a report on such effects on the environment* (Journal of Laws No. 257, item 2573 with further amendments) (along with a related annex),
 - in the decree of the Minister of Infrastructure from the 12th April 2002 *in the case of technical requirements which should be met by structures and their location* (Journal of Laws No. 75, item 690 with further amendments);
- j) Undertaking of activities for the benefits of introducing changes to the Infrastructure and the Environment Operational Programme:
- Priority IX. Environmentally-friendly energy-generating infrastructure and its energy efficiency – Activity 9.1 – Highly-efficient generation of energy and Activity 9.4 – Production of energy from renewable sources in the scope of reducing the minimal value of the project for investment in the area of electricity generation from biomass or biogas and the broadening of the catalogue of projects concerned with the construction of thermal-electric power plants fuelled by biomass or biogas,
 - Priority X. Energy security, including the diversification of energy sources – Activity 10.3 – Development of the industry of renewable energy sources, in the scope of the broadening of the catalogue of types of projects concerned with construction of a production line manufacturing devices used among others, in the production of electricity and heat.

6.3. Current financial assistance for the construction of agricultural biogas plants

The high costs of the preparation for investment and the high initial investment expenditures in the renewable energy source technologies in the scope of biogas installations, significantly impede the development of energy production utilizing agricultural biogas energy. The key tools presented below used for supporting of investments connected with constructing of installations generating and converting agricultural biogas into energy³:

a) **Supporting of the biogas plants as part of the Infrastructure and Environment Operational Programme**

Priority IX. Environmentally-friendly energy infrastructure and energy efficiency – Activity 9.1 – Highly efficient energy production

The goal of the activity is the increase in the efficiency in manufacturing of electricity and heat by way of combined construction and redevelopment of the electricity and heat generating units as a result of which, these units will meet the requirements for highly efficient cogeneration. Assistance provided within the scope of the activity, will be for projects related to the combined generation of energy from renewable sources. The beneficiaries of such assistance may include: entrepreneurs, regional government bodies and their unions, associations and cooperatives, entities rendering public services as part of the realization of duties of their own regional governmental bodies. Minimum project value - 10 million PLN. Maximum assistance value - 30 million PLN.

- **Priority IX. Environmentally-friendly energy infrastructure and energy efficiency – Activity 9.4 – Energy production from renewable sources**

As part of the activity, assistance will be granted to investments in the scope of constructing or increasing the power output of electricity or heat from renewable sources (biomass and biogas). As part of the projects being realized the assistance will include the terminals of the electricity generating units from renewable sources to the nearest existing networks. The terminal must constitute an integral part of the project related to the energy generating unit, necessary for achieving the goals of such project. The beneficiaries of such assistance may

³ The complete informations in the scope of financing of agricultural biogas plants from the European Union funds, may be found in the materials entitled "A Guide – European funds for renewable energy" available at: www.mg.gov.pl/Gospodarka/Energetyka as well as in the individual source documents available at www.mrr.gov.pl. The related nomenclature and the rules for granting of assistance are indicated in the Directions in accordance with legal regulation in this scope, especially with regulations of the directive of the European Union Commission No 800/2008 from 6th June 2008 recognizing certain types of assistance as valid in accordance with the common market in the sense of Art 87 and 88 of the Treaty (general directive in the case of block exclusions) (Official Journal of the European Union L No 214 from 09.08.2008, page 3).

include: entrepreneurs, regional government bodies and their unions, associations and cooperatives, entities rendering public services as part of the realization of duties of their own regional governmental bodies, churches, church legal persons and their associations as well as other religious unions. The minimal project value for an investment in the scope of electrical energy production from biomass or biogas – 10 million PLN. Maximum assistance value - 40 million PLN.

- **Priority X. Energy security, including the diversification of energy sources – Activity 10.3 – Development of the renewable energy sources industry**

The main goal of the activity is to increase the effectiveness of diversification of energy sources and the development of the renewable energy sources. The assistance will be granted for projects connected with the construction of technological production lines manufacturing devices used in generation of electricity and heat from renewable sources. As part of the activity, the assistance may be granted to investments based on the construction of facilities for manufacturing of devices generating, among others, electricity from biogas and biomass, heat using biomass and electricity and heat in cogeneration, utilizing biomasses. The beneficiaries of such assistance may include entrepreneurs. Minimum project value qualified for assistance - 8 million PLN. Maximum non-refundable assistance value may not exceed 30 million PLN.

- b) Support of a biogas plants as part of the National Fund for Environmental Protection and Water Management**

As part of the *Program for undertakings in the scope of renewable energy sources and highly effective cogenerating structures – part 1*, developed by the National Fund for Environmental Protection and Water Management, funds have been assigned for the generation of electricity and/or heat with the use of biogas resultant from processes of waste, clearing of sewage or biodegradation of plant and animal remainders.

The forms of financing available for beneficiary may be categorized into:

- Interest-bearing loan;
- the granting of financing may be preceded by a promise of lending.

The value of the loan may amount between 4 million PLN and 50 million PLN with the assumption of up to 75% of the qualified costs being subsidized. Minimum project value amounts to 10 million PLN.

The beneficiaries of such assistance may include: Entities undertaking the realization of projects in the scope of renewable energy sources and high-efficiency cogeneration.

Detailed information concerning the program may be found at:

<http://www.nfosigw.gov.pl/srodki-krajowe/programy-priorytetowe/oze-i-kogeneracja/oze-i-kogeneracja-cz1/>

The National Funds for Environmental Protection and Water Management is realized in cooperation with the Voivodeship Funds for Environmental Protection and Water Management, a *Program for projects in the scope of renewable energy sources and high-efficiency cogeneration facilities – part 2*. The direct beneficiaries are the Voivodeship Funds while the end beneficiaries are the entities undertaking the realization of the projects themselves which deal with renewable sources of energy and high-efficiency cogeneration. The total cost of a project can amount to between 0,5 million PLN and 10 million PLN.

Detailed information concerning the program may be found at:

<http://www.nfosigw.gov.pl/srodki-krajowe/programy-priorytetowe/oze-i-kogeneracja/oze-i-kogeneracja-cz2/>

As part of the Green Investments System (GIS), the National Fund for Environmental Protection and Water Management, fulfilling the function of a National Operator of the Green Investments System, is realizing the priority program of agricultural biogas plants.

Being a part of the program, the National Fund for Environmental Protection and Water Management assumes the financing of the following types of activities:

- construction, development or redevelopment of structures used agricultural biogas for generation of electricity or heat with exclusion of landfill biogas installation.
- construction, development or redevelopment of agricultural biogas generating installations in order to introduce it into the distribution and direct gas networks.

A minimum total project value amounts to 10 million PLN.

Detailed information concerning the program may be found at:

http://www2.nfosigw.gov.pl/system-zielonych-inwestycji---gis/programy-priorytetowe/gis-program-biogazownie_rolnicze/

c) Supporting of biogas plants as part of the Rural Development Program

The Rural Development Program for 2007-2013 is a tool for realization of the European Union's policy in the scope of developing rural areas. The document stipulates the goals, priorities and rules on the basis of which selected activities which relate to these issues will be subsidized.

The scope of the assistance includes among others the generation or the distribution of energy from renewable sources, especially originating from biogas and biomasses. This scope includes investment costs and especially: the purchase of materials and realization of construction-assembly works as well as the purchase of the necessary equipment. The assistance may be granted to communes or supporting units designated by the communes. The volume of the assistance may amount to a maximum of 75% of qualified costs, with no more than 3 million PLN per each commune (for renewable energy sources) within the period of the program's realization.

- **Activity 121. Modernization of farmsteads**

The assistance granted as part of this activity concerns investments connected with the undertaking or the modernization of the production of agricultural food or non-food products including products designated for purposes of energy generation. Assistance may be granted, among others for the purchase of machinery and equipment used for the cultivation, harvesting, storage, preparation for sale of agricultural products further used as a raw materials or substrates for the production of energy materials. The scope of the undertakings may include investments in equipment used for the production of energy from renewable sources for the needs of agricultural production within a given farmstead. This means that within this activity, the assistance may only be used for investments where the production of heat or electricity in a biogas plant will be used for the purposes of other types of agricultural activity or for own uses of the given farmstead.

The beneficiary of this activity may be a: natural person (between the age of majority but not having reached the retirement age), a legal person, a partnership operating an agricultural activity in the scope of plant or animal production. The maximum assistance granted to a single beneficiary for a single farmstead within the scope of the activity, during the period of realization of the Rural Development Program, may not exceed the amount of 300 thousand PLN. The minimum value of qualified costs for a project is 20 thousand PLN.

- **Activity 123. Increase of the addend value of the basic agricultural and forestry production**

This activity supports the investments in the scope of processing solely agricultural and food products or non-food products, including agricultural products used for energy generating purposes. Investments connected with the chemical modification of agricultural products in the manufacturing process of biofuels, not being agricultural products, will not be supported as part of the Rural Development Program while they may be co-financed as part of the Structural Funds (among others, from the European Regional Development Fund). The scope of the projects in this activity may include investments in equipment used for the production of energy from renewable sources or by-products (biogas) for the needs of agricultural production within a given farmstead processing facility.

The beneficiary of the activity may include a natural or legal person or an organizational unit without legal personality, which:

- possesses a registered economic activity in the scope of processing or trading in agricultural products;
- operates as an entrepreneur operating an activity as a small or medium enterprise or a company employing less than 750 personnel or a company the turnover of which does not exceed the PLN equivalent of 200 million EUR.

The level of the possible assistance to be received as part of the described activity amounts to:

- 25% of the costs of an investment qualifying for assistance, realized by an entrepreneur being a small or medium enterprise;
- 40% of the costs of an investment qualifying for assistance, realized by an entrepreneur operating an activity as a small or medium enterprise;
- 50% of the costs of an investment qualifying for assistance, realized by an entrepreneur operating an activity as a small or medium enterprise, which is realizing a project concerned with the processing of agricultural products for energy-generation purposes.

- **Activity 312. Establishment and development of micro enterprises**

The goal of the activity is the aiding of the increase in competitiveness of rural areas and the sustainable social and economic development in those regions. In other words, the main goal of this activity is the increase of employment in rural areas. The assistance is being granted to entities as a result of investments connected with the creation or the development of micro enterprises operating in the scope of, among others, the manufacture of energy-generating

biomass products. A significant issue is the fact that the sole criteria for granting of the financial assistance is the creation of at least a single position of employment.

The beneficiaries of such assistance may include: a natural or legal person, an organizational unit not possessing a legal personality which operates or undertakes the operation as a microenterprise, employing less than ten persons and having a turnover not exceeding the equivalent of 2 million PLN. The assistance granted as part of this activity comes in the form of refunding of a part of incurred qualified costs. The level of assistance may not exceed 50% of the qualified costs and may at the same time not be greater than:

- 100 thousand PLN – if the business plan includes the creation from 1 to 2 positions of employment (in calculation of full average annual employment) which is justified by the scope of the factual operations;
- 200 thousand PLN – if the business plan includes the creation from 2 to 5 positions of employment (in calculation of full average annual employment) which is justified by the scope of the factual operations;
- 300 thousand PLN – if the business plan includes the creation of at least 5 positions of employment (in calculation of full average annual employment) which is justified by the scope of the factual operations;

- **Activity 321. Basic services for the rural economy and population**

The financial assistance within the this activity is granted above all for the realization of projects in the scope of production or the distribution of energy from renewable sources including among others, from biogas. The goal of the activity is the improvement of the technical infrastructure of the rural areas which facilitates the improvement in living conditions of the population.

A beneficiary of the assistance may be a commune or the commune's entity rendering auxiliary services. The maximum amount of the assistance for the realization of projects within a single commune, during the realization of the Program, may not exceed 3 million PLN – for projects in the scope of producing or distribution of renewable sources of energy.

d) Environmental Protection Bank

Taking into account the increased interest of the market and the need for protecting the environment, Environmental Protection Bank with its seat in Warsaw (BOŚ S.A.) wanting to meet the demands of the customers, has prepared a credit offer connected with the investments in this specific area. The bank's offer includes products with preferential crediting conditions (reduced interest), granted especially thanks to the cooperation of BOŚ S.A. with the Voivodeship funds for environmental protection and water management. The credit conditions are different for all Voivodeships. All those interested may apply for this kind of assistance. A credited party may be a natural person, an entrepreneur as well as a territorial self-government (provided this is permitted by the conditions of the agreement between BOŚ S.A. and the individual Voivodeship funds). BOŚ S.A. additionally offers credit from a range of foreign banks (e.g. KfW - Kreditanstalt für Wiederaufbau) for long-term investments connected, among others, with renewable sources of energy or other investment projects with a pro-ecological profile.

In the case of a lack or limited possibilities for crediting of projects on preferential conditions, the bank also offers commercial credit loans and other financial products. BOŚ S.A. supplies its clients with the support of professionals, ecologists working for the bank – an engineering staff possessing the experience in the creation of the most favourable conditions for financing of individual projects. The ecologists will provide consultation to the bank's clients, free of charge, so that the project prepared for the pro-ecological investment meets the technical and legal requirements. The bank performs an estimation of the projects' risk and the possibility of payment of the obligations from future incomes.

e) Regional Operational Programs for 2007-2013

Among the assistance programs it is also important to present the Regional Operational Programs (RPO). Similarly to the earlier described Operational Programs, they constitute a collection of priorities the a scope of which foresees different activities for which the Regional Operational Programs provide different possibilities of financial assistance. Due to the fact that the Regional Operational Programs differ both in priorities, activities as well as the possibility for receiving financial assistance depending on the Voivodeship for which they

are intended, the specific information is found on the Internet websites of the individual Voivodeship Self-governments⁴.

7. Informational and educational activity within the scope of constructing and utilizing of agricultural biogas plant installations

A significant social factor slowing the development of agricultural biogas plants is the lack of knowledge concerning the processes and technologies for generating and managing of the manufactured agricultural biogas, procedures for operating at the location of the investment, access to the technologies and the sources of financing as well as the lack of knowledge of these issues among the public administration. This concerns especially the insufficient propagation of appropriate educational programs in educational institutions and the impaired access to knowledge on the existing and future development of biogas plant technologies.

The realization of the hereby document therefore depends upon reaching of many different social groups. This task requires the performing of a wide-spread informational, educational and promotional campaign which should explain the legitimacy of realizing the Directives and disperse the stereotypes and social barriers including those resulting from fears and threats connected with the manufacturing of biogas. The realization of this task is based on materials, educational and promotional programs as well as trainings and seminars. This realization will be participated in by scientific and training instructions, employees from the appropriate governmental departments, agricultural counselling centres, scientific and didactical units as well as the media. It is very important in light of the activities targeted at the dynamic development of constructing biogas installations, the undertaking of informational and educational activities aimed at the individual groups of investors interested in this field.

7.1. Activities directed at the public

The activities directed at the public will be based on:

- a) development and the propagation of informations (via television, radio and the Internet) concerning biogas plants in the context of environmental benefits as well

⁴ Links to the individual regional operational programs are found on the Internet site: www.mrr.gov.pl

as the influence on the increase in renewable sources of energy along with an increase in the locally available energy sources;

- b) organizing of knowledge contests among children and the youth concerning the topics of biogas plants and their beneficial influence on the environment.

Responsibility for the above activities rests upon: the ministers specific to the issues of the economy, the environment, the agriculture, education and higher learning (with the participation of the agencies and institutions subordinate to the ministers) and the educational superintendents.

7.2. Activities directed at farmers and agricultural producers

Activities directed at farmers and agricultural producers are to include the:

- a) creation and distribution of a guide concerning the methods and costs of constructing a biogas plant, its benefits to the environment and the consumption of energy in a farmstead as well as administrative procedures which a potential investor has to undertake. Guide will also spread the knowledge about the possibility for cofounding of these types of installation from public assets;
- b) creation of informational programs for farmers on the possibilities and benefits from the production and utilization of biogas along with proposed schedules for their implementations and tasks for the farmers connected with these processes;
- c) making active biogas plants available to farmers and agricultural producers interested in their construction, for the purpose of familiarization with their operations and resultant benefits;
- d) organization of a series of trainings and lectures for farmers and agricultural producers on the topics connected with biogas installations as well as the utilization of local energy sources.

Responsibility for the above activities rests upon: Minister responsible for matters of agriculture (with the cooperation of agencies and institutions subordinated to the minister), the National Council of Agriculture Chambers.

7.3. Activities directed at self-governments and entrepreneurs

Activities directed at self-governmental entities as well as other entrepreneurs should assure:

- a) a preparation of an informational program dedicated to the construction of agricultural biogas plants and the tasks connected therewith for the environmental and nature protection services at all levels of the local governments.
- b) making active biogas plants available to representatives of communes, self-governments, interested in their construction, for the purpose of familiarization with their principles of operation;
- c) organization of a series of trainings and topical conferences for communes, self-governments, entrepreneurs and all persons interested on the topics connected with biogas installations as well as the utilization of local energy sources (e.g. realization of films promoting the construction of agricultural biogas plants).

Responsibility for the above activities rests upon: ministers responsible for matters of agriculture and the environment (with the cooperation of agencies and institutions subordinate to the ministers).

8. Miscellaneous activities

8.1. Realization and the actualization of the Directions

The coordination of the realization of the hereby document rests upon the minister responsible for matters of the economy. The minister appropriate for the presentation of proposed amendments to the legal regulations and the applied activities, should no later than within the period of 1 year from the acceptance of the document by the Council of Ministers initiate the appropriate legislative procedures and appropriate activities. The sources of financing for the individual Directions activities, with the exception of those for which it has been specifically stipulated, will be the financial means guaranteed in the budgets of the appropriate disposers of such funds.

The institutions and entities responsible for the implementation of the document are obligated to monitor, within the scope of its properties, the progress of its implementation and realization. The monitoring is based on information concerning the state of implementation for appropriate activities, prepared at the closing of each calendar year. These informations will be prepared by the individual government departments involved in the realization of the Directions. Additionally, the appropriate data will originate from periodic reports prepared by the President of the Energy Regulatory Office, the President of the Agency for Agricultural Markets and potentially, non-government organizations (chambers and associations

concerned with the development of usage of reusable sources of energy). These informations will be passed to the minister appropriate to matters of the economy responsible for supervising the timeliness of the realization in accordance with the submitted schedule.

This monitoring is necessary for the evaluation of:

- a) the realization level of the document's assumptions;
- b) promotion of utilization of local renewable sources of energy;
- c) promotion of the development of biogas plants based especially on agricultural raw materials;
- d) economic profitability of the biogas plant utilization process;
- e) influence on the realization of goals connected with the limiting of green house gas emissions and the improvement of the status of energy safety.

The results of the monitoring will constitute a basis for the realization of the current evaluation as well as the modernization and modification of the document according the to the needs.

8.2. Bodies responsible for the realization of the individual Directions

Type of activity	Responsible body
Research as well as informative and educational activities	Ministers specific to the issues of the economy, the environment, agriculture, science and higher education and the educational superintendents
Solutions in the scope of the Infrastructure and Environment Operational Programme	Ministers specific to the issues of the economy and matters of regional development
Solutions in the scope of energy law	Minister specific to the issues of the economy
Solutions in the scope of managing and utilizing the "Natura 2000" European network of protected areas and in the scope of waste management.	Minister specific to the issues of the environment
Solutions in the scope of fertilizers and fertilization of energy crops	Minister specific to the issues of agriculture
Research projects related to agricultural biogas plants	Minister specific to the issues of science and higher education

Appendix 2

"Energy Policy of Poland
until 2030"

Ministry of Economy

Energy Policy of Poland until 2030

**Document adopted by
the Council of Ministers
on 10 November 2009**

Warsaw, 10 November 2009

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1. Introduction

1.1. Determinants

Currently, the Polish energy sector is facing a number of serious challenges. High demand for energy, inadequate fuel and energy generation and transmission infrastructure, significant dependence on external supplies of natural gas and almost full dependence on external supplies of crude oil, as well as commitments in the field of environmental protection, including climate protection, compel us to take decisive actions preventing the deterioration of the situation of fuel and energy customers.¹

At the same time, the global economy witnessed a series of unfavourable events in recent years. Significant fluctuations in prices of energy-producing raw materials, the increasing demand of developing countries for energy, serious breakdowns of energy systems, and the increasing environmental pollution require a new approach to energy policy.

As part of its environmental protection commitments, the European Union set quantitative objectives for 2020, the so-called “3x20%,” i.e. reducing greenhouse gases emission by 20% of 1990 levels, reducing energy consumption by 20% of the projected 2020 levels and increasing the share of renewable sources of energy to 20% of total energy generation, including an increase in the use of renewables in transport to 10%. In December 2008, the EU adopted the climate and energy package which contains specific legal tools to attain the above objectives. By means of actions initiated at the national level, the energy policy contributes to the implementation of energy policy objectives specified at the Community level.

This document has been drafted in accordance with Articles 13–15 of the Energy Law and presents the strategy of the state which aims to address the most important challenges that the Polish power industry must face, both in the short and in the long run, until 2030.

1.2. Primary directions of energy policy

As a Member State of the European Union, Poland actively participates in devising the Community energy policy, it also implements its main objectives under the specific domestic conditions taking into account the protection of interests of customers, the energy resources and technological conditions of energy generation and transmission.

In line with the above, the primary directions of Polish energy policy are as follows:

- To improve energy efficiency;
- To enhance security of fuel and energy supplies;
- To diversify the electricity generation structure by introducing nuclear energy;
- To develop the use of renewable energy sources, including biofuels;
- To develop competitive fuel and energy markets;
- To reduce the environmental impact of the power industry.

The adopted directions of energy policy are largely correlated. Improvement of energy efficiency reduces the increase in demand for fuels and energy, and thus it is conducive to

¹ These diagnosis of the problems was presented in Appendices 1, 2, and 4 to the present document.

enhancing energy security by reducing dependence on import; it also reduces the environmental impact of the power sector by reducing emissions. The development of renewable energy sources, including the use of biofuels and clean coal technologies, and introduction of nuclear energy bring about similar effects.

Implementing measures in accordance with the above directions, the energy policy will strive to enhance the country's energy security observing the principle of sustainable development

The Energy Policy constitutes a part of the priorities of the National Development Strategy 2007–2015 adopted by the Council of Ministers on 29 November 2006. In particular, the objectives and measures laid down in the document will contribute to the implementation of the priority concerning the improvement of the condition of technical infrastructure. The objectives of the Energy Policy are also convergent with the objectives of the renewed Lisbon Strategy and the renewed EU Sustainable Development Strategy. The energy policy will strive to meet the commitment contained in the two abovementioned EU strategies which assumes the transformation of Europe into a low-carbon economy with a reliable, sustainable, and competitive energy supply.

1.3. Energy policy tools

The main energy policy tools are as follows:

- Legal regulations setting forth the operating principles for the fuel and power sector, and defining technical standards;
- Effective use of owner's supervision by the State Treasury to implement the energy policy objectives within its competence;
- Ongoing regulatory activities of the President of the Energy Regulatory Office (Polish abbreviation: URE), consisting in verification and approval of tariffs, and application of benchmarking analysis to regulated energy markets;
- System mechanisms to support implementation of measures aimed at achieving the primary objectives of energy policy which are currently not commercially profitable (e.g. the certificate market, tax benefits and exemptions);
- Ongoing monitoring of the situation on fuel and energy markets by the President of the Office of Competition and Consumer Protection (Polish abbreviation: UOKiK) and the President of the Energy Regulatory Office and intervention measures within their competence;
- Activity within the structures of the European Union, particularly those leading to such EU energy policy and Community requirements in respect of environmental protection that would take into account the nature of the Polish power sector and result in Poland's enhanced energy security;
- Poland's active membership in international organisations, such as the International Energy Agency;
- Statutory activity of local government bodies taking account of the priorities of the Energy Policy of Poland, also through public-private partnerships (PPP);
- Hierarchic spatial planning ensuring the implementation of energy policy priorities, plans of electricity, heat, and gas fuels supply to communes and the development plans of power companies;

- Information activities conducted by government bodies and by co-operating research and development centres;
- Support of energy projects significant to Poland (e.g. investment projects, research and development) with public funds, including European funds.

Within the framework of energy policy implementation, a profound reform of the energy law will be carried out. It will result in drafting a set of new regulations. As a result, stable and transparent conditions for operation of entities in the area of fuel and energy market economy will be created.

Measures set forth in the energy policy will be largely implemented by commercial energy companies operating on competitive fuel and energy markets or on regulated markets. Therefore, state intervention in the operation of the sector must be limited and must have a clearly defined objective, namely to ensure energy security in Poland and to meet its international commitments, particularly in respect of environmental protection and nuclear safety. State intervention in the energy sector will be used exclusively to ensure security, and always in accordance with the EU legislation.

1.4. Document structure

The structure of this document mirrors the primary energy policy directions. For each of the directions, main objectives and, depending on the needs, also specific objectives are formulated, as well as measures for their implementation, and their anticipated effects. Chapter 8 presents measures supporting the implementation of the policy at the international level and at the local government level. Implementation of the majority of measures provided for in this paper will begin prior to 2012, but their effects will be long-term and will allow meeting the objectives set for 2030. Appendices present the projection of demand for fuels and energy, assessment of implementation of the energy policy since 2005 onwards, the action plan schedule for the years 2009–2012 and the conclusions from the strategic environmental impact assessment of the energy policy.

2. Improving energy efficiency

Improving energy efficiency is one of the priorities of the EU energy policy, whose goal is a 20% reduction in energy consumption by 2020 as compared to the “business as usual” scenario. Poland has made significant progress in this respect. Although GDP energy intensity declined by 30% within the last 10 years, efficiency of the Polish economy calculated as GDP (at euro exchange rate) per energy unit remains twice as low as the European average. Economic development, resulting from the use of new technologies, reveals a considerable increase in electricity consumption accompanied by a relative decrease in the use of other energy forms.

Energy efficiency is given priority in the energy policy; and progress in this respect will be of key importance to implementing all of its objectives. Therefore, all possible steps will be taken to enhance energy efficiency.

2.1. Objectives in respect of enhancing energy efficiency

The main energy policy objectives in the field are as follows:

- **To achieve zero-energy economic growth, i.e. economic growth with no extra demand for primary energy;**
- **Reducing the energy intensity of Polish economy to the EU-15 level.**

Specific objectives in the area are as follows:

- To enhance efficiency of power generation by building highly efficient generation units;
- To achieve a twofold increase (as compared to 2006) in power generation with the use of highly efficient cogeneration technology by 2020;
- To limit grid loss during transmission and distribution by i.a. modernising the existing and building new grid, replacing low efficiency transformers, and developing distributed generation;
- To increase efficiency of end-use of energy;
- To increase the ratio of annual demand for power to the maximum demand for power at peak usage hours, which allows to limit the total cost of meeting the demand for power.

2.2. Measures to improve energy efficiency

The measures include:

- Setting the national objective of enhancing energy efficiency;
- Introducing a systemic mechanism to support measures aimed at attaining the national objective of enhancing energy efficiency;
- Stimulating development of cogeneration through support mechanisms, taking into account cogeneration from sources up to 1 MW and appropriate commune policy;
- Using mandatory energy performance certificates for buildings and apartments upon their marketing or renting;
- Determining energy intensity of devices and power-consuming products, introducing minimum standards for power-consuming products;
- Committing the public sector to serve as a role model of economical energy usage;
- Supporting investments in energy saving through preferential loans and grants from domestic and European funds, also under the Act on supporting thermomodernisation and renovations, the Operational Programme Infrastructure and Environment, and the National Fund for Environmental Protection and Water Management;
- Supporting research and development on new solutions and technologies reducing energy consumption, in all kinds of its processing and use;
- Applying Demand Side Management techniques, stimulated by diversification of distribution prices during the day and of electricity prices on the basis of reference prices as a result of introduction of an intra-day market and sending price signals to customers with the use of remote bilateral communication via electronic meters;
- Informational and educational campaigns promoting efficient energy use.

In addition, the indicative target stemming from the Directive 2006/32/EC² will be implemented, which assumes energy savings of 9% of the annual average amount of end-use energy consumption from the period 2001–2005 by 2016 (i.e. by 53,452 GWh) laid down in the National Action Plan for Energy Efficiency, adopted by the European Committee of the Council of Ministers on 31 July 2007 and other measures stemming from the document, which are not listed herein.

2.3. Expected effects of measures to improve energy efficiency

As a result of implementing the proposed measures, the increasing consumption of energy by the Polish economy is expected to slow down, thus increasing energy security. Reducing energy consumption has also a measurable effect which consists in avoiding emission of pollutants by the energy sector. Finally, stimulating investments in modern energy-saving technologies and products will contribute to enhancing innovation in the Polish economy. Energy savings will significantly add to the improvement of economy efficiency and competitiveness.

3. Enhanced security of fuels and energy supplies

Security of fuels and energy supplies is understood as ensuring stable fuels and energy supplies at a level that guarantees meeting domestic needs at prices acceptable for the economy and the society, assuming the optimal use of domestic deposits of energy resources, and through diversification of sources and directions of supply of crude oil, as well as liquid and gas fuels.

Poland has large deposits of coal which, considering the dependency of our country on the import of gas (in almost 70%) and of crude oil (in over 95%), will play the role of a major factor stabilising Poland's energy security. The energy policy will be targeted at diversifying supplies of raw materials and fuels understood also as diversification of technologies, not as it had been understood until recently – as mere diversification of supply directions. Development of technologies, which make it possible to obtain liquid and gas fuels from domestic resources, will be supported.

Due to the gradual exhaustion of hard coal and lignite in the currently used deposits, the plans are in place to prepare and launch the use of new deposits by 2030. Therefore, it is necessary to ensure access to strategic coal resources by means of, *inter alia*, protection of their location from further infrastructural development unrelated to the energy sector and their inclusion in the spatial development concept of the country, local spatial development plans and long-term development strategy. It is also necessary to correlate the plans of deposits exploitation with the investment plans in other sectors, e.g. in relation to road infrastructure, in those documents. It concerns in particular the hard coal deposits of “Bzie-Dębina,” “Śmiłowice,” “Brzezinka” and lignite deposits of “Legnica” and “Gubin,” as well as satellite deposits of operating mines.

² Directive 2006/32/EC of the European Parliament and of the Council of 5 April 2006 on energy end-use efficiency and energy services and repealing Council Directive 93/76/EEC (OJ L 114, 27.4.2006, p. 64–85).

In the sectors of natural gas and crude oil, it is also essential to increase transmission capacity of gas transport and storage systems and of oil and fuel pipelines, as well as their transshipment and storage infrastructure, including cavities in salt structures. The growth of natural gas extraction capacity should be used not only to satisfy the current needs but also to serve as a security in the case of exceptionally unfavourable weather conditions or external disturbances.

The current projections, concerning the possibility to meet future demand for electricity in Poland, point to the need to extend the existing generation capacity. The commitments to reduce greenhouse gas emission force Poland to seek low-emission solutions for electricity generation. All available technologies of coal-based energy generation will be applied on the assumption that they would lead to reducing air pollution.

Electricity is produced in the domestic system with reduced possibilities of international exchange – currently less than 10%. Thus, apart from the development of electricity generation capacity, power grid transmission and distribution capacity, the main directions of energy policy include also increasing the possibilities to exchange electricity with neighbouring countries. To that end, relevant statutory regulations will be introduced lifting the existing barriers.

Creating conditions for strengthening the competitive position of Polish energy sector entities so that they may compete in European energy markets is also an important element of energy policy in the area.

3.1. Objectives and measures to enhance security of fuels and energy supplies

3.1.1. Fuels – sources and transmission

3.1.1.1 Coal

The main objective of energy policy in this field is efficient and effective management of coal deposits located within the territory of the Republic of Poland.

State energy policy assumes using coal as the main fuel for the power industry in order to ensure an adequate level of energy security of the country.

Specific objectives in the field are as follows:

- Ensuring energy security of the country by meeting domestic demand for coal, ensuring stable supplies to customers and the required qualitative parameters;
- Use of coal in the energy industry by application of efficient and low-emission technologies, including coal gasification and processing it into liquid or gas fuels;
- Using modern technologies in the coal mining sector to enhance competitiveness, work safety, environmental protection, and to establish the basis for technological and scientific development;
- Maximum use of methane released when extracting coal in mines.

To accomplish the above objectives, the following measures will be taken:

- Introducing regulations which take into account the objectives proposed under the energy policy, particularly instruments motivating to carry out preparatory work and to retain appropriate level of mining capacity;
- Developing modernised pre-treatment technologies for coal to be used for energy production;
- Abolishing legal barriers to making new deposits of hard coal and lignite available;
- Identifying strategic national resources of hard coal and lignite and protecting them through inclusion in spatial development plans;
- Securing access to coal resources via undertakings making available new, documented, strategic deposits and their industrial use – through public purpose investments of supra-local significance;
- Intensifying geological research to extend the coal resource base, making use of state of the art prospecting and surveying techniques;
- Completing organisational and structural changes. In economically justified cases, allowing the possibility to establish capital groups on the basis of coal and energy companies, observing the principles of social dialogue;
- Supporting the industrial use of methane released when extracting hard coal in mines;
- Introducing technology solutions which allow recovery of methane from ventilation air pumped out of hard coal mines;
- Obtaining funds for development of the mining industry through privatisation, after consultations with social partners. Legitimacy of privatisation, the volume of shares, and the IPO date will be analysed in terms of energy policy objectives;
- Supporting research and development of technologies permitting to use coal for liquid and gas fuels production, mitigating the negative environmental impact of processes of obtaining energy from coal as well as coal fuel cells technologies;
- Retaining the competence of the minister in charge of the Treasury in respect of mining companies by the Minister of Economy.

3.1.1.2 Gas

The main objective of energy policy in the field is ensuring Poland's energy security through diversification of sources and directions of natural gas supplies.

Specific objectives in the field are as follows:

- Extending natural gas resources at the disposal of Polish companies;
- Extending natural gas extraction capacity in the territory of Poland;
- Ensuring alternative sources and directions of gas supplies to Poland;
- Extending the natural gas transmission and distribution system;
- Extending natural gas storage capacities;
- Polish companies winning access to natural gas deposits located outside Poland;
- Producing gas with the use of coal gasification technologies;
- Industrial use of methane by extraction through surface boreholes.

Measures aimed to diversify supplies will always be preceded by an economic analysis of alternative possibilities to produce gas from domestic resources, including the use of new technologies.

Measures in the field are as follows:

- Appropriate tariff policy encouraging investment in pipeline infrastructure (gas transmission and distribution);
- Building a terminal for receiving liquefied gas (LNG);
- Concluding arm's length contracts for diversified natural gas supplies to the liquefied gas reception terminal and from the north;
- Establishing sustainable management policy for domestic gas resources to allow extension of natural gas reserve base in the territory of Poland;
- Investments which allow extending natural gas extraction in the territory of Poland;
- Diversification of supplies by building a transmission system for natural gas supplies from the north, west, and south, as well as building connections to primarily meet the requirement of supply sources diversification;
- Polish companies winning access to natural gas deposits located outside Poland;
- Supporting investments in infrastructure with the use of European funds;
- Streamlining the crisis response mechanism;
- Securing state interests in strategic companies of the gas sector;
- Investment incentives for building storage space (by appropriate tariff structure and ensuring return on invested capital);
- Legislative measures aimed at lifting barriers to investments, particularly in respect of large investment projects in infrastructure (warehouses, LNG infrastructure, gas compressor stations, etc.) and linear investments;
- Further pilot work on making methane from hard coal deposits available.

3.1.1.3 Crude oil and liquid fuels

The global market of crude oil and liquid fuels is competitive, yet in the case of Poland there is a threat to security of crude oil supplies as well as a threat of monopolistic price fixing. This is a result of the market being dominated by supplies from one direction only. In order to avoid such a situation, the level of supply diversification needs to be enhanced (it is essential not only to increase the number of suppliers, but also to eliminate a situation where oil comes from a single area, and its transmission is controlled by a single entity).

The main objective of energy policy in the field is to ensure energy security by:

- **Enhancing the diversification level of crude oil and liquid fuels supply sources, understood as obtaining crude oil from various regions of the world, from different suppliers, using alternative transport routes;**
- **Building crude oil and liquid fuels storage facilities of capacity which ensures continuity of supplies, particularly in crisis.**

Specific objectives in the field are as follows:

- Diversification of crude oil supplies to Poland, inter alia by building infrastructure permitting to transport crude oil from the Caspian Sea region;
- Extension of transport and transshipment infrastructure for crude oil and oil products;
- Building and expanding crude oil and liquid fuel storehouses (cavern storage facilities, transshipment and storage bases);
- Polish enterprises winning access to crude oil deposits located outside the Republic of Poland;
- Increasing the amount of crude oil transited through the territory of the Republic of Poland;
- Enhancing competitiveness in the sector in order to minimise the negative effects for the economy which result from significant changes in prices of raw materials on global markets;
- Retaining state ownership in key companies of the sector, as well as in infrastructure companies;
- Mitigating the risk of hostile takeover of entities dealing in crude oil processing which render services in the area of transmission and storage of crude oil and oil products;
- Enhancing the security of fuel transport by sea.

Measures aimed to diversify crude oil supplies will always be preceded by an economic analysis of alternative possibilities to obtain liquid fuels from domestic resources, including the use of new technologies.

Measures in the field are as follows:

- Building infrastructure to allow transport of crude oil from other regions of the world, inter alia from the Caspian Sea region within the Euro-Asian Oil Transportation Corridor project;
- Supporting actions of Polish companies aimed at intensification of prospecting and enhancing national exploitation on land, in the Baltic Sea shelf and outside Poland;
- Extending transmission, transshipment, and storage infrastructure (including caverns) for crude oil and liquid fuels;
- Application of owner's supervision tools of the State Treasury to stimulate and monitor execution of projects in respect of security of crude oil and liquid fuel supplies;
- Legislative changes concerning liquid fuel reserves, particularly lifting the obligation of physical maintenance of reserves by enterprises in exchange for a special purpose fee intended for maintenance of reserves by a public law entity;
- Lifting barriers to development of fuel infrastructure and supporting investment projects in infrastructure with the use of European funds;
- Ensuring fuel transport by sea.

3.1.2. *Generation and transmission of electricity and heat*

The main objective of energy policy in the field is to ensure ongoing meeting of demand for energy, taking into account the maximum possible use of domestic resources and environmentally friendly technologies.

Specific objectives in the field are as follows:

- Building new generation capacity to balance domestic demand for electricity and maintain the operationally available power surplus during the peak generation capacity of domestic conventional and nuclear generation sources at the minimal level of 15% of the maximum domestic demand for electricity;
- Building intervention sources of electricity generation essential to security of the power system operation;
- Developing the national transmission system enabling sustainable economic development of Poland, its individual regions and ensuring reliable electricity supplies to agglomerations (particularly closing the 400 kV loop and loops circling Poland's largest cities), as well as receipt of electricity from the areas with a large number of planned and newly built generation facilities, including in particular the wind farms.
- Developing cross-border connections coordinated with extending the domestic transmission system as well as the systems in neighbouring countries, which will allow to exchange at least 15% of electricity used in Poland by 2015, 20% by 2020, and 25% by 2030;
- Modernisation and extension of the distribution grid which allows to improve the reliability of power supply and to develop distributed power generation using local sources of energy;
- Modernisation of transmission and distribution grids to reduce failure frequency by 50% by 2030 as compared to 2005;
- Aiming at replacing the heat and power plants supplying the centralised heat distribution systems of Polish cities with cogeneration sources by 2030.

To accomplish the above objectives, the following measures will be taken:

- Imposing an obligation to prepare development plans of the transmission and distribution grid on grid operators, with particular indication of preferred locations of new generation capacity and the costs of their connection. The plans will be developed and published every three years;
- Legislative measures aimed at lifting barriers to investments, particularly linear investments;
- Introducing long term contracts for system regulatory services covering intervention reserves and rebuilding supply to the national power system by the transmission system operator;
- The transmission system operator announcing tenders for intervention capacities essential to ensuring safety of the power system operation;
- Reconstruction and reinforcement of the existing power lines and building new ones, particularly those enabling cross-border electricity exchange with neighbouring countries;
- Establishing methodology for calculating return on invested capital as an element of cost justified in transmission and distribution tariffs for investments in grid infrastructure;

- Introducing amendments into the Energy Law consisting in defining the responsibility of local government bodies for drafting local supply assumptions for plans and plans for heat, electricity, and gas fuel supply;
- Transferring owner's supervision over the operator of electricity transmission system (PSE Operator S.A.) into the competence of the Minister of Economy;
- Retaining a majority stake in PGE Polska Grupa Energetyczna S.A. and a controlling stake in Tauron Polska Energia S.A. at the level which ensures retaining owner's supervision by the State Treasury;
- Introducing a qualitative element into transmission and distribution tariffs to which transmission and distribution system operators would be entitled if they reduced failure frequency rates and maintained them at levels specified by the President of the Energy Regulatory Office for a given grid type;
- Changing regulation mechanisms by introducing methods of heat price-fixing with the use of reference prices and incentives to optimise the heat supply cost;
- Preferential treatment of combined generation as the technology recommended for building new generation capacity.

3.2. Anticipated effects of measures to enhance security of fuels and energy supplies

3.2.1. Fuels – sources and transmission

Accomplishment of energy policy objectives will allow to reduce Poland's dependency on import of natural gas, crude oil, and liquid fuels from a single direction. Increasing the share of gas extracted in Poland, or manufactured on the basis of Polish raw materials, is a plausible objective. The capacity to store crude oil, liquid fuels, and natural gas allowing to supply the country with the necessary fuels in emergency situations will improve significantly.

Relying on domestic coal resources as the main fuel of the system power industry would bring about practically total independence of electricity generation and considerable independence of heat generation from external supply sources, particularly in large city systems, ensuring energy security with regard to electricity generation and supplies.

3.2.2. Generation and transmission of electricity and heat

Implementation of energy policy in the area of electricity generation will allow to balance the electricity demand, which increases quickly due to Poland's economic development. The regulatory power necessary to adjust electricity generation to the changing daily demand will be ensured.

Development of transmission and distribution grids would improve their reliability, while information on potential locations of generation capacity will facilitate making investment decisions. Granting connection conditions for a specific period, along with the necessity to pay a deposit, will eliminate a common phenomenon of blocking the investments by failing to use the connection conditions.

Introducing precise methodology of calculating the rate of return on capital invested in infrastructure will allow to attract commercial investors. Introducing a qualitative element into transmission tariffs will constitute an incentive for transmission and distribution system operators to enhance the reliability of grid operation.

An important step on the way to enhance energy security is the development of distributed power generation using local energy sources, such as methane or renewable energy sources. The development of this type of energy generation also allows to reduce grid investment, especially investment in the transmission system. The system of incentives for distributed energy generation, in the form of support systems for renewable energy sources and cogeneration, will result in considerable investment in distributed energy generation.

4. Diversification of the electricity generation structure by introducing nuclear energy

Poland's energy security requires ensuring supplies of an appropriate amount of electricity at reasonable prices, simultaneously observing the environmental protection requirements. Climate protection and the climate and energy package adopted by the EU result in the need of switching generation to low CO₂ emission technologies. In the current situation, particular significance is attached to using all available technologies simultaneously enhancing energy security and lowering emission of pollutants, retaining economic efficiency.

With the current trends in European energy policy, nuclear energy has become one of the most desired energy sources. Apart from the lack of CO₂ emission, it also ensures independence of typical directions from which energy resources are obtained. The Resolution of the Council of Ministers of 13 January 2009 imposed an obligation on all process participants to take intensive actions aimed at setting the stage for implementing the nuclear energy production programme in Poland in line with the requirements and recommendations specified in documents drafted by the International Atomic Energy Agency. Observing the scheduled date of launching first nuclear power plant by 2020 requires a considerable contribution of state bodies and budget funds, qualified personnel, and efficient institutions both at the preparatory stage prior to making the final decision on starting the nuclear energy production programme and at the stage of preparations for the tender procedure.

Preparatory works related to the introduction of nuclear energy generation in Poland will include in particular broad social consultation, as well as identification and minimisation of potential threats.

It is also necessary to ensure long-term access to all elements of the fuel cycle. Uranium may be obtained from politically stable regions and strong competition among uranium producers prevents them from dictating extreme prices. The issues of fuel purchase by EU Member States are coordinated by the Euratom Supply Agency which has been established by Euratom for that specific purpose.

4.1. Objectives in respect of diversification of the electricity generation structure by introducing nuclear energy

The primary objective of energy policy in the field is preparing infrastructure for nuclear energy generation and ensuring appropriate conditions for investors interested in building and launching nuclear power plants based on safe technologies, with public support and a high degree of nuclear safety at all stages of the process: location, designing, construction, launching, exploitation, and liquidation of nuclear power plants.

Specific objectives in the field are as follows:

- Adapting the Polish legal system so that the process of developing nuclear energy sector in Poland is efficient;
- Training personnel for the nuclear energy sector;
- Informing and educating the society on nuclear energy;
- Selecting locations for first nuclear power plants;
- Selecting a location and building a cemetery for low- and medium-radioactivity waste;
- Adding to the personnel of the nuclear energy sector and radiation safety;
- Establishing a research base for the nuclear energy production programme on the basis of existing research institutes;
- Preparing fuel cycle solutions ensuring Poland's permanent and safe access to nuclear fuel, recycling of spent fuel, and storage of high-radioactivity waste.

4.2. Measures for diversification of the electricity generation structure by introducing nuclear energy

Measures in the field are as follows:

- Establishing an institutional basis for preparing and implementing the Polish nuclear power programme;
- Defining essential amendments to the legal framework for implementing the Polish nuclear power programme, preparing and coordinating implementation of the amendments;
- Preparing a draft of the Polish nuclear power programme to constitute the basis for public consultations; holding the consultations and submitting the Polish nuclear power programme for approval by the Council of Ministers;
- Preparing the National Atomic Energy Agency to execute nuclear and radiological supervision of the nuclear power sector;
- Implementing the personnel training programme for institutions dealing with nuclear power;
- Preparing and holding an informational and educational campaign on the Polish Nuclear Power Programme;
- Location analyses for nuclear energy plants;
- Location analyses for the radioactive cemetery, its design and construction preparations;
- Building research and development capacity and supporting work on new reactor technologies and nuclear-coal synergy. Preparing the programme of Poland's participation in all phases of the fuel cycle;
- Preparing Polish industry's participation in the nuclear energy production programme;
- Preparing plans of adapting the transmission grid to nuclear power plants;
- Prospecting uranium deposits in the territory of Poland.

4.3. Anticipated effects of measures for diversification of the electricity generation structure by introducing nuclear energy

As an effect of the planned measures concerning nuclear energy, the programme of introducing nuclear energy generation in Poland will be presented to the Council of Ministers for approval. Also at this stage, the organisational and legal infrastructure for the implementation of the programme of introducing nuclear power generation in Poland will be prepared. In particular, the following processes will take place: acceleration of the training of personnel and development of training and research base for the nuclear power sector, raising the society's awareness of nuclear power generation, development of the basis related to the disposal of radioactive waste and increase in the number of domestic enterprises ready to carry out the orders of the quality required by the nuclear power sector.

5. Development of the use of renewable energy sources, including biofuels

Development of renewable energy production is of considerable importance for meeting the primary objectives of energy policy. Increasing the use of renewable energy sources translates into a higher degree of independence from imported energy supplies. The promotion of the use of renewable energy sources allows to increase diversification of the sources of supply and to create conditions for the development of distributed power generation based on locally available raw materials. Renewable energy production usually takes place in small power generation units, located close to the customer, which enhances local energy security and reduces transmission losses. Generation of power from renewable sources is characterised by little or no emission of pollutants, thus having positive ecological effects. Developing renewable energy production is also conducive to the growth of underdeveloped regions, rich in renewable energy sources.

Sustainable use of individual types of energy from renewable sources will be supported. As regards the use of biomass, special preference will be given to the most energy efficient solutions, *inter alia*, using various techniques of biomass gasification and conversion into liquid fuels, in particular the second generation biofuels. The use of biogas from landfills, wastewater treatment plants and other waste will be of great importance. The target is to use biomass by means of distributed generation. The development of wind power, both on land and at sea, is predicted. The increased use of water power will also be important, both the small-scale and larger water power facilities, with no significant environmental impact. The use of geothermal energy is to increase thanks to the use of heat pumps and direct use of geothermal water. Solar energy is to be used to a much greater extent than before, by means of solar collectors and innovative photovoltaic technologies.

In view of the expected dynamic development of renewable energy sources, the solutions which will ensure the stability of the power system operation, in particular using innovative technologies, become increasingly important.

5.1. Development objectives of using renewable energy sources

The main energy policy objectives in the field are as follows:

- **Increasing the use of renewable energy sources in the final energy use to at least 15% in 2020 and further increase in the following years;**
- **Increasing the share of biofuels in the market of transport fuels to 10% by 2020, and increasing the use of second generation biofuels;**
- **Protecting forests against overexploitation in order to obtain biomass, and balanced use of agricultural areas for production of renewable energy sources, including biofuels, so as not to allow competition between renewable energy production and agriculture and to preserve biodiversity;**
- **Using the existing weirs owned by the State Treasury for power generation;**
- **Increasing the diversification of supply sources and the creation of optimal conditions for distributed power generation based on locally available resources.**

5.2. Measures to increase the use of renewable energy sources

Measures in the field are as follows:

- Devising a path to reach a 15% share of renewable energy sources in the sustainable use of final energy, broken down into individual energy types, namely: electricity, heat, cold and renewable energy in transport;
- Retaining support mechanisms for producers of electricity from renewable sources, e.g. by means of a system of certificates of origin;
- Retaining the obligation to gradually increase the share of bio-components in transport fuels so as to meet the planned objectives;
- Introducing additional support instruments encouraging more extensive production of heat and cold from renewable energy sources;
- Implementing the directions of building agricultural biogas plants, on the assumption that at least one biogas plant is set up in each commune by 2020;
- Creating conditions to facilitate making investment decisions on building off-shore wind farms;
- Retaining the principle of exempting energy from renewable sources from excise tax;
- Direct support to building new renewable energy generation units and power grids that could be connected with the use of European funds and environmental protection funds, including funds gathered in the form of the substitute fee and fines;
- Stimulating the development of the Polish industry's which manufactures machinery for the renewable energy sector, also with the use of European funds;
- Supporting the development of technologies and building installations to obtain renewable energy from waste comprised of biodegradable materials (e.g. municipal waste with biodegradable fractions);
- Evaluation of plausibility of using the existing damming structures owned by the State Treasury to generate power by way of taking their inventory, establishing their framework environmental impact, and devising the rules of making them available.

Apart from the above measures, the implementation of the *Long-term Programme for Promotion of Biofuels or Other Renewable Fuels in Transport for the years 2008–2014*, adopted by the Council of Ministers on 24 July 2007, will be continued.

5.3. Anticipated effects of measures to increase the use of renewable energy sources

The planned measures will allow to meet the objectives set for the share of renewable energy sources, including biofuels. They will result in sustainable development of renewable energy sources, including biofuels, without negative impacts on agriculture, forest management, food sector and biodiversity. Positive effects of developing renewable energy sources will include the reduced CO₂ emission and increased Poland's energy security, through, inter alia, enhancing energy mix diversification.

6. Development of competitive fuel and energy markets

Competitive fuel and energy markets are conducive to lowering production costs and thus reduce the increase of fuels and energy prices.

The retail market for liquid fuels may be regarded as quite competitive, despite the fact that supplies of crude oil to the wholesale market come mainly from a single direction, as a considerable discharge capacity of the Gdansk port and the transmission capacity between the port and the main Plock-based refinery ensure a certain degree of independence from the 'Druzhba' pipeline. The two main companies operating on the fuel market fix their prices depending on purchase costs.

Despite the consolidation of coal mines, the coal market is also considerable. The possibility to import coal by sea and by land is conducive to market-based price-fixing. Some hard coal and lignite mines operate in capital groups including power plants. However, in practice the market-based fixing of the price of this fuel is distorted by costs of transport from abroad and within the country.

Despite introducing the structures stipulated by the Directive 2003/55/EC³, i.e. the sectioning off and designating of the transmission network operator and gas distribution system operators, as well as the gas fuel storage system operator by the President of the Energy Regulatory Office, the gas market is still largely monopolised. The access of new entities to the market is difficult. Moreover, almost 70% of the domestic demand for natural gas is covered from a single supply direction, which influences both the lack of supply diversification and the possibility of price competition between gas suppliers.

Market principles have been implemented to a greater extent in the electricity generation sector. According to the Directive 2003/54/EC⁴, system operators, i.e. the transmission network and the distribution network operators, were isolated. Long-term contracts, limiting the scope of the market, were liquidated and the obligation of submitting electricity tariffs for customers other than households or agricultural holdings for approval of the President of the Energy Regulatory Office was lifted. However, despite the numerous changes introduced, the market does not operate fully properly. The existing platforms, i.e. the power exchange and internet-based platforms, have very little turnover. Due to existing barriers, mainly economic, technical, and organisational ones, not many customers have decided to change their electricity supplier.

³ Directive 2003/55/EC of the European Parliament and of the Council of 26 June 2003 concerning common rules for the internal market in natural gas and repealing Directive 98/30/EC (OJ L 176, 15.7.2003, p. 57–78).

⁴ Directive 2003/54/EC of the European Parliament and of the Council of 26 June 2003 concerning common rules for the internal market in electricity and repealing Directive 96/92/EC (OJ L 176, 15.7.2003, p. 37–56).

6.1. Objectives in the area of developing competitive markets

The main objective of energy policy in the area is to ensure undisturbed operation of the fuel and energy markets, thus counteracting excessive price increase.

Specific objectives in the field are as follows:

- Enhancing diversification of sources and directions of supplies of natural gas, crude oil, and liquid fuels, along with diversification of suppliers, transmission routes, and transport methods, including also by using renewable energy sources;
- Removing the barriers in switching between electricity and gas suppliers;
- Developing competition mechanisms as the primary means to rationalise energy prices;
- Regulating the fuel and energy market in the areas characterised by natural monopoly in a way which ensures balancing of interests of all market participants;
- Reducing regulations where competitive market functions and develops on its own;
- Participating in building the regional electricity market, in particular enabling the international exchange;
- Implementing an efficient electricity balancing mechanism to support security of energy supplies, trade in futures and intraday markets, identification and allocation of individual costs of energy supply;
- Establishing a liquid spot market and an electricity futures market;
- Introducing market-based methods of heat price fixing.

6.2. Measures for development of competitive markets

The key measures under the energy policy concerning the introduction of competitive mechanisms and extension of their scope on markets of liquid fuels, natural gas, and coal are identical to measures aimed at improving energy security. Therefore, only the additional measures concerning the electricity and natural gas market are presented below, including in particular:

- Implementing a new model of the electricity market which consists, inter alia, in introducing the intra-day market, the power reserve market, transmission rights market, and generation capacity market, as well as introducing a mechanism to manage system services and system constrained generation;
- Facilitating switching between power sellers, inter alia through introducing national standards for technical features of electronic electricity meters, as well as their installation and reading;
- Creating conditions allowing to fix electricity reference prices on the market;
- Optimising the conditions of pursuing a business in Poland by energy-intensive customers in order to prevent their products sold in international markets from losing competitive appeal;
- Protecting the poorest electricity customers from the effects of electricity price increase;

- Changing competition-supporting regulation mechanisms of the gas market and introducing arm's length methods of gas price-fixing.

Apart from above measures, the position of the President of the Energy Regulatory Office is to be strengthened in relation to the necessity to implement the guidelines from new market directives and to make adjustments to the consolidated energy sector structure, in particular by means of creating possibilities to shape the desired market structure and infrastructure.

6.3. Anticipated effects of measures for development of competitive markets

Accomplishment of the above objectives will allow to extend the scope of competitive markets in fuels, electricity, and heat, thus leading to enhanced competition between fuel and energy suppliers. This will result in reducing the increase in prices of fuels and energy, including the increase triggered by external factors, such as increasing crude oil or gas prices, or policy measures taken by other states to reduce fuel supplies.

7. Mitigating the environmental impact of the power industry

7.1. Objectives aimed at mitigating the environmental impact of power industry

The main energy policy objectives in the area are as follows:

- Reducing CO₂ emission by 2020, while maintaining a high level of energy security;
- Reducing emission of SO₂, NO, and dust (including PM10 and PM2.5) to the level set forth in the current and drafted EU regulations;
- Reducing the negative impact of the power sector on the condition of surface water and groundwater;
- Minimising waste dumping by using them in the economy to the greatest possible extent;
- Changing the structure of energy generation towards low-emission technologies.

7.2. Measures aimed at mitigating the environmental impact of power industry

Measures in the field are as follows:

- Establishing a system to manage national emission caps of greenhouse gases and other substances;
- Introduction of acceptable product emission rates for electricity and heat generation as a tool which allows reducing SO₂ and NO_x emission levels and reaching the emissions cap set forth for Poland in the Accession Treaty ;

- Meeting the commitments for the power and heat sectors stemming from the new ETS Directive⁵ ;
- Using the income from auctions of CO₂ emission allowances to support measures aimed at reducing greenhouse gas emission volumes;
- Introducing standards for building new power plants under the system of preparation for carbon capture and setting national capacity for geological CO₂ storage, including in empty crude oil and natural gas deposits at the bottom of the Baltic Sea;
- Active participation in implementing the initiative of the European Commission to build large-scale demonstration facilities for carbon capture and storage (CCS) technologies ;
- Applying CCS technologies to support crude oil and natural gas extraction;
- Intensifying research and development on the CCS technology and on new technologies which allow using captured CO₂ as a raw material by other industry branches;
- Industrial use of waste coal;
- Increasing the use of incineration by-products;
- Using high-efficiency closed cooling cycles in power plants and in heat and power stations;
- Diagnosing the possibility of unintended production of persistent organic pollutants (dioxins and furans) by the power sector;
- Supporting measures in respect of environmental protection with the use of, inter alia, European funds.

Apart from the above measures, the implementation of the *State ecological policy in the years 2009–2012, with the prospect to 2016*, will be essential for accomplishing the energy policy objectives, in particular with regard to reducing dust emission, using waste and protecting surface water and groundwater.

7.3. Anticipated effects of measures aimed at mitigating the environmental impact of power industry

The anticipated measures will allow reducing SO₂, NO_x, and dust emission in line with the commitments assumed by Poland. Measures aimed at reducing CO₂ emission should result in a considerable reduction in emission volume per unit of energy generated.

The said document takes into account the measures allowing Poland to meet the obligations stemming from the regulations of the European Union currently in force. Measures aimed at implementing the draft legal acts comprising the energy and climate package adopted by the European Parliament in December 2008 were particularly taken into account.

As a result of negotiations on the assumptions of the draft Directive on the system of trade in emissions, Poland was granted the possibility of applying a transition period with regard to the obligation of purchasing all greenhouse gas emission allowances by the power systems from 2013. The systems operating in Poland as at 31 December 2008 will purchase only some

⁵ Directive 2009/29/EC of the European Parliament and of the Council of 23 April 2009 amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading scheme of the Community (OJ L 140, 5.6.2009, p. 63–87).

of the allowances they need at auctions – 30% in 2013 (as compared to average reference emission in the years 2005-2007 or based on fuel-weighted emission indicators). The number of free allowances will be gradually reduced in the years 2014-2019 to reach the full auction system in 2020. Additionally, the possibility of winning free allowances will be granted to systems in respect of which the investment process began physically prior to 31 December 2008. The said transition period will prevent eliminating coal from the portfolio of primary fuels, which would result in weakening of Poland's energy security. It will allow to verify the possibility of wide scale use of commercial CCS technologies or will provide a basis for using the revision clause with regard to the assumptions of the climate and energy package. Derogations for the electricity sector from 100% purchase of CO₂ emission allowances by auction may be prolonged for the period beyond 2020.

Introducing standards for building coal-fired power plants within the system of preparation for CO₂ capture resulting from the new EU regulations will allow to quickly introduce those technologies when they are ready for commercial use.

It is anticipated that at least two CCS demonstration facilities will be located in Poland.

8. Supporting measures

The implementation of energy policy will be supported by actions taken by Poland within the international community, in particular on the European Union forum, aimed at shaping the global and the European energy policy taking into account the specific characteristics of Poland, its deposits of energy resources, and actual possibilities of changing energy generation technologies.

In order to ensure that strategic directions of energy policy of Poland are followed, it is necessary to actively apply the available instruments of both Community policy and foreign policy.

The Minister of Economy will monitor on an ongoing basis the actions taken by Poland on the EU forum and relating to energy policy. His representatives will actively participate in the work of working groups, committees, and commissions dealing with energy security, electricity, natural gas and crude oil. At the same time, the Minister of Economy will on a current basis analyse the developments in the international environment of Poland in terms of possible threat for the energy security of Poland.

The Members of the Council of Ministers and other representatives of the Government of the Republic of Poland will initiate the actions at the EU level or support the activities of the European Union bodies aimed at:

- Building international infrastructure for transmission of crude oil to the EU Member States, in particular extending the Odessa-Brody pipeline to Plock, as an element of the Eurasian Oil Transportation Corridor;
- Introducing the rules of using the transmission infrastructure by crude oil and natural gas producing countries which will ensure energy interests of the consumers of those resources and transit countries. This objective may be achieved by the ratification of the Energy Charter Treaty by the Russian Federation and signing of the Transit Protocol of the Energy Charter Treaty, as well as the extension of the group of states bound by the Energy Charter Treaty;
- Rational and justified expansion of power networks, including cross-border connections of the Polish system and the systems of neighbouring countries;

- Establishing a special EU financial mechanism to support the building of necessary connections within the EU and with the EU eastern neighbours;
- Maintaining the existing and establishing new Community financial instruments allowing to implement the objectives of the energy and climate package, in particular those relating to the development of clean carbon technologies, increasing the effectiveness of energy use and development of renewable energy sources;
- Shaping future objectives and instruments of the Community environment and climate policy which will take into account the maintenance of the high level of energy security and competitiveness of the economy in the Member States where coal dominates the energy generation structure;
- Building infrastructure allowing to diversify natural gas supplies to Poland (LNG terminal on the Polish coast, a pipeline connection with the Norwegian Continental Shelf);
- Establishing rules of conducting multilateral EU policy and building internal systems of European Union's energy security, in particular the mechanism of response to crisis situations.

Within the framework of international co-operation and on the European Union forum, Poland will strive for halting infrastructural projects whose implementation could negatively impact energy security of Poland and at the same time will strive for implementing projects which may strengthened this security.

International arrangements will be made and other actions taken to establish operators, in line with the EU law, on all cross-border power lines and gas pipelines on the territory of Poland and to enhance their integration with the Polish and the European systems.

Poland will aim at playing the key role in the integration of the regional electricity market and will assume the role of an emissary of practical implementation of the European standards into the functioning of the markets. It will also strive for implementing the standards of power systems' cooperation with third countries (i.a. by building connections and developing trade in electricity with Lithuania, Ukraine and Belarus). Poland will also aim at extending the Energy Community by Ukraine and will support Ukraine in negotiations on accession to the Energy Community.

Along with Germany, Poland was the initiator of the establishment of the Central Eastern European Forum for Electricity Market Integration which will launch works aimed at creating a single regional electricity market, accelerating the construction of infrastructure connections and harmonisation of law on electricity in the region.

Intensive cooperation will continue with the Vysehrad Group countries and the Baltic states within the framework of the EU and with the beneficiary countries of the Eastern Partnership Programme.

The government will fully support the efforts of power and gas transmission system operators and the regulator to achieve a significant position of Polish entities within structures responsible for unifying management standards of the European power grid (electricity and gas) and in institutions responsible for market supervision in public interest. Through active participation of relevant authorities and enterprises in the ACER, ENTSO-E and ENTSO-G, Poland will aim at shaping the solutions in market regulation and operators' co-operation in line with the Polish energy policy, including the national investments in the European infrastructure development plans and taking into account specific conditions of Poland while formulating the European network codes.

The foreign energy policy will create a favourable climate for investments of Polish fuel and energy enterprises in other countries. Poland will also ensure support to those enterprises with regard to joint projects with foreign entities.

Another important element supporting the implementation of energy policy is active participation of local authorities in the process of achieving its objectives, including the development of the energy sector development strategy at the province, district or commune level. It is of utmost importance for local governments not to overlook the energy generation sector when setting investment priorities. Moreover, investment plans of communes and of energy companies must be correlated. The need for planning in terms of energy is now of key importance because the subsequent years will bring major challenges to Polish communes, inter alia in meeting environmental requirements or using the European funds for regional development, which entails the need to improve the condition of power infrastructure in order to ensure high quality services for local communities, to attract investors, and to enhance competitiveness and attractiveness of the region. Good planning in terms of energy constitutes one of the basic factors conditioning success of implementation of Poland's energy policy.

The most important elements of energy policy at the regional and local level should include:

- Aiming at fuel and energy savings in the public sector by implementing measures laid down in the *National Action Plan for energy efficiency*;
- Maximising the use of the local renewable energy potential, both for the generation of electricity, heat, cold, cogeneration, as well as for generating liquid biofuels and biogas;
- Increasing the use of technologies of high-efficiency cogeneration of heat and electricity, as a favourable alternative for supplying energy to heat systems and large facilities;
- Developing the locally centralised heating systems which allows to improve efficiency and environmental parameters of the heat supply process and to increase the local level of energy security;
- Modernisation and adjustment of the electricity distribution network to the current needs of the customers, in particular the modernisation of networks in rural areas and the networks supplying the areas characterised by low energy consumption;
- Expanding the natural gas distribution network in areas with poorly developed gas network, in particular in northern and eastern Poland;
- Supporting the infrastructural investments of strategic importance for energy security and development of the country in the communes, in particular the construction of transmission networks (for power, gas, crude oil and liquid fuels), storage infrastructure, energy resources mines and large system power plants.

9. Energy policy implementation system

Pursuant to Article 12(2)(1) of the *Energy Law*, the Minister of Economy is responsible for coordinating the implementation of energy policy, but the accomplishment of the energy policy objectives will require actions of numerous central and local government administration bodies, as well as the companies operating in the fuel and energy sector. In order to improve co-operation between those entities, an interministerial team will be established to prepare legal and organisational solutions for implementing the energy policy.

Specific tasks presented in this document whose implementation will start within four years have been defined in Appendix 3 entitled *Action Plan for the years 2009–2012*. The plan describes the method of implementation of each measure of the energy policy. Each measure contains specific tasks with the deadlines and institutions responsible for their implementation. The implementation of *Action Plan for the years 2009–2012* will be monitored on a current basis by the Minister responsible for the economy. The Minister of Economy, in cooperation with competent ministers, will submit information about the energy policy implementation for the previous year to the Council of Minister by 31 March of each year, along with the proposed modifications of the measure implementation methods and adjustments to the current situation.

The measures laid down in this document are to be continued beyond 2012 in order to efficiently implement the energy policy objectives for 2020 and 2030. However, another action plan for the years 2013–2016, taking into account new conditions and forecasts, will be determined in 2012.

The progress in the energy policy implementation will be monitored in particular on the basis of indicators presented in the table below and in Appendix 4.

Table 1. Basic indicators of energy policy implementation monitoring

Item number	Name of indicator	Baseline value 2007	Expected value by 2030	Data source
1.	Annual average change in primary energy consumption in the country since 2005 (%)	2,7	Below 1	Central Statistical Office
2.	Hard coal and lignite extraction to domestic consumption (in tons) ratio (%)	105	Over 100	Central Statistical Office
3.	Maximum share of total natural gas and crude oil imports (in tons) from a single direction in the domestic consumption of both those resources (%)	85	Below 73	Ministry of Economy
4.	Generation capacity of domestic generation sources (conventional and nuclear) to maximum demand for electricity ratio (%)	130	Over 115	Ministry of Economy
5.	Share of nuclear power in the electricity production (%)	0	Over 10	Ministry of Economy
6.	Share of energy from renewable sources in the final consumption of energy (%)	7.7	Over 15	Ministry of Economy
7.	Annual emission of CO ₂ in utility power generation as compared to the national electricity generation (tons/MWh)	0.95	Below 0.70	Ministry of Economy

Within the meaning of the Act of 6 December 2006 on the rules governing the development policy, *Energy Policy of Poland until 2030* is considered to be a sectoral strategy. Apart from the measures directly laid down in the documents, the objectives of the Policy will also be implemented through other sectoral development programmes and operational programmes, such as *Operational Programme Infrastructure and Environment*. The support from the European funds for investments, actions for education, research and development, envisaged in the national and regional operational programmes for the years 2007–2013, is an extremely important element of the energy policy implementation.

The implementation of the energy policy will also be supported by periodical analytical and forecasting works aimed at determining the impact of developments in legal and economic environment on possible results of planned measures. The results of those works will be taken into account while selecting optimal sets of tools to achieve the assumed policy objectives.

The government sectoral programmes for hard coal, gas, oil and electricity sector which were in force before the adoption of the Energy Policy of Poland until 2030 will be analysed in terms of their compliance with this document and will either be adjusted to it or will become ineffective.

The *Energy Policy of Poland until 2025*, adopted by the Council of Ministers on 4 January 2005, and the *Timetable for the implementation of executive tasks until 2008 specified in the Energy Policy of Poland until 2025*, adopted by the Council of Ministers on 12 July 2005, become ineffective upon the adoption of this document.

10. Appendices

Appendix 1. Assessment of implementation of energy policy since 2005 onwards

Appendix 2. Projection of demand for fuels and energy until 2030

Appendix 3. Action Plan for the years 2009–2012

Appendix 4. Conclusions from strategic Environmental Impact Assessment of Energy Policy

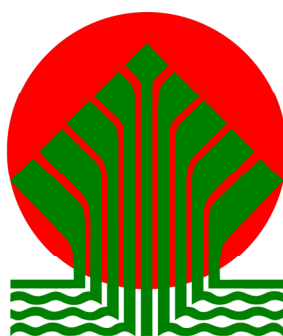
Appendix 3

"Green Investment Scheme Part 2: Agriculture Biogas Plants"

Green Investment Scheme (GIS) Programme

Part 2

Agricultural biogas plants



**National Fund for Environmental Protection
and Water Management**

Green Investment Scheme Operator

Poland

PRIORITY PROGRAMME

Programme title:

GIS – Green Investment Scheme

Part 2) Agricultural biogas plants.

1. Objective of the programme

Reducing or avoiding carbon dioxide emissions from combustion of fossil fuels by co-financing the construction of agricultural biogas plants using renewable resources.

2. Indices of achieving the objective

Planned value of indicator (reduction of CO₂ emissions) to be achieved based on signed till 2013 co-financing agreements reaches 89 158 Mg/year. Value of the indicator to be achieved in the period 2015-2017 based on the planned confirmation of the environmental effect is established on the level of 187 500 Mg/year.

As a result of contracts for the sale of emission credits¹ there are plans to achieve the indicators contained in Annex 2 for them.

Table providing detailed information about indicator is provided in the Annex 4.

3. Budget

1. The budget is set at:

1) Planned commitments for non-refundable form of co-financing is set at PLN 100 729,2 thousand – from the resources obtained from sale of assigned amount units (AAUs) or other resources of the National Fund.

2) Payments under executed and planned commitments for non-refundable form of co-financing is set at PLN 140 576,5 thousand.

3) Planned commitments for refundable form of co-financing is set at PLN 160 789,1 thousand – from resources of the National Fund.

4) Payments under executed and planned commitments for refundable form of co-financing is set at PLN 209 001,3 thousand

2. The budget table for the priority programme has been presented in Annex 3 to the programme.

4. Implementation period

1. The program is being implemented in the years 2010 – 2017.

2. Allocation of funds in the years 2010 – 2014.

3. Disbursement of funds: until 31 December 2015.

¹ Sales contracts as defined in article 19 of the Act referred to in paragraph 6 point 3 of the priority programme

5. Deadlines and manner of the submission of applications

The call for proposals takes place under competition procedure. Announcements will be placed at www.nfosigw.gov.pl.

6. Legal basis for granting co-financing

1. The Act of 27 April 2001 – Environmental Protection Law (Dz. U. of 2008 No 25 , item 150 as amended)
2. The Act of 10 April 1997 – - Energy Law (Dz. U. of 2010 No 21 , item 104 as amended).
3. the Act of 17 July 2009 on the system to manage the emissions of greenhouse gases and other substances (Dz. U. No. 130 item 1070, as amended).
4. The public aid will be granted in accordance with the conditions defined in:
 - 1) the ordinance of the Council of Ministers of 22 December 2006 on establishing aid programme in the scope of regional public aid for certain environmental protection investments (Dz. U. No 246, item 1795, as amended), hereinafter referred to as "the ordinance on regional aid";
 - 2) the Commission Regulation (EC) No 1998/2006 of 15 December 2006 on the application of Articles 87 and 88 of the Treaty to de minimis aid (OJ L 379,, 28.12.2006), hereinafter referred to as "the regulation on de minimis aid".
5. Co-financing may be granted to undertakings consistent with the Regulation (EC) No 1774/2002 of the European Parliament and of the Council of 3 October 2002 laying down health rules concerning animal by-products not intended for human consumption (OJ L 273, 10.10.2002, p. 1, as amended; Dz. U. Polish special edition, chapter 3, vol. 37, p. 92, as amended).
6. Act on Waste of 27 April 2001 (Dz. U. of 2007 No. 39, item 251, as amended).

7. Detailed rules for the award of co-financing

7.1 Forms of co-financing

- 1) grant;
- 2) loan.

7.2 Intensity of co-financing

- 1) Amount of grant: up to **30%** of eligible costs referred to in point 9.2, subject to point 3;
- 2) amount of loan: up to **45%** of eligible costs referred to in point 9.1, subject to point 3;
- 3) In case when co-financing meets the requirements for acknowledging it as the public aid, it will be granted with consideration to conditions defined in points 4 – 6.
- 4) co-financing in the part allocated for preparatory activities (including: technical concepts, feasibility study, environment impact report) is granted as de minimis aid in accordance with conditions defined in the regulation on de minimis aid.
- 5) regional aid is granted for the remaining eligible costs, in accordance with conditions defined in the ordinance on regional aid.
- 6) regional aid intensity is calculated with consideration to the total value of public aid from all sources envisaged in financing for a given undertaking and cannot exceed the allowed intensity of public aid defined in the provisions of the ordinance on regional aid.

7.3 Conditions of co-financing

- 1) grant may be granted from the GIS funds and/or other funds of the NFEPWM.

- 2) in case of projects co-financed from GIS funds, obtaining loan from the NFEPWM funds is subject to receiving grant from GIS funds;
- 3) minimum total cost of the project over PLN 5 000 thousand;
- 4) co-financing cannot be granted to projects which received co-financing from other priority programmes of the NFEPWM;
- 5) co-financing in form of loans:
 - a) variable interest rate WIBOR 3M +50 base points (annually). Interest is paid regularly on a quarterly basis. The first payment at the end of the calendar quarter following the quarter in which payment of the first tranche of funds was made.
 - b) period of financing: loan may be granted for a period not longer than 15 years after the date of the first planned payment of loan tranche,
 - c) grace period: grace period for the payment of principal instalments may apply when granting a loan, calculated from the date of the disbursement of the last loan tranche, yet no longer than 18 months from the completion date of the project implementation.
 - d) loan cannot be amortised.

7.4 Beneficiaries

- 1) Entities (natural persons, legal persons or organisations without legal status which are granted legal capacity by the act) implementing projects in the scope of producing electricity or thermal energy with the use of biogas created in the processes of decomposition of plant or animal remnants as well as producing agricultural biogas in order to introduce it to the distribution and direct gas network;

7.5 Types of undertakings

- 1) Construction, development and reconstruction of facilities for production of electricity or thermal energy with the use of agricultural biogas;
- 2) Construction, development or reconstruction of installation for production of agricultural biogas in order to introduce it to distribution and direct gas network.

7.6 Procedure for granting co-financing (in the scope of GIS funds)

- 1) The call for proposals will take place under competition procedure. Announcement on the call of proposals and its conditions will be placed in a nationwide newspaper and on NFEPWM website;
- 2) NFEPWM after collecting applications within the competition will assess them and prepare a list of projects initially qualified for co-financing from GIS funds;
- 3) contract for co-financing from GIS funds may be signed after approval of the project for co-financing made by the Minister of the Environment;
- 4) In the case when the Minister of the Environment removes the project from the list of projects initially qualified for co-financing, the applicant has the right to appeal to the Minister and then in case of sustaining the decision, the right to appeal to the administrative court.

8. Detailed criteria for selection of undertakings

Access criteria			
Formal criteria:		Yes	No
1.1	Application is submitted within the deadline		
1.2	Application is submitted on valid form and filled out in Polish		
1.3	Application is complete, signed correctly, has required annexes for technical, environmental and financial assessment		
1.4	Application contains correct arithmetic calculations		
1.5	Type of undertaking is consistent with section 7.5 of the priority programme		
1.6	Applicant is included in the category “Beneficiaries” – section 7.4 of the priority programme		
1.7	Costs are consistent with the catalogue of “Eligible costs” indicated in section 9 of the priority programme		
1.8	Type and amount of planned co-financing are consistent with detailed provisions for granting co-financing defined in sections 7.1 – 7.3 of the priority programme		
1.9	Co-financing applied for is consistent with the principles of public aid (if applicable)		
Substantive criteria:		Yes	No
1.10	New devices were used		
1.11	Selected implementation variant – solution selected on the basis of the analysis of options, justification given for the adopted solution		
1.12	Technical feasibility (including: correct selection of technology which guarantees material durability of the investment, realistic schedule of implementation).		
1.13	Environmental (including: reliability of assumptions and data, achievable ecological effect that is also possible to maintain for 5 years after the project completion).		
1.14	Cost analysis (including: investment layouts and operational costs estimated on the basis of reliable data and realistic assumptions).		
1.15	Market conditions (including: appropriate assessment of the potential of renewable energy source, possibility of acquiring raw materials and selling energy)		
1.16	Institutional structure and formal and legal aspects (including: transparent ownership structure and legal form, clear contact relations, submitted application for issuing building permit or having building permit(s) regarding all elements of the investment (if required), promise of licences by the President of the Energy Regulatory Office (if required)		
1.17	Financial structure (including: reliable financing, feasibility and financial durability of the undertaking, type and amount of collateral acceptable by the NFEPWM)		
Does the application qualify for further assessment?			
Criterion for selecting applications			
2.1	Cost-efficiency (DGC – Dynamic Generation Cost, see Annex 1)		

Negative result at the stage of access criteria excludes the application for co-financing from further proceedings.

9. Eligible costs²

1. period of eligibility of the costs from 1 January 2010 to 31 December 2015, subject to provisions on State aid.
2. In the case of GIS funds, the catalogue of eligible costs and the period of eligibility will be defined in the competition documentation.
3. VAT does not represent eligible cost if the beneficiary is able to reclaim or deduct VAT. If the beneficiary is not able to reclaim or deduct VAT, it constitutes eligible cost.

9.1 Costs eligible for co-financing from NFEPWM funds

9.1.1 Costs eligible for de minimis aid:

- 1) preparatory activities (including technical concepts, feasibility study, environment impact report), provided that they have been demonstrated in the application for co-financing.

9.1.2 Costs eligible for regional aid:

- 1) construction plans and detailed designs;
- 2) cost of purchase or production of new fixed assets, including:
 - a) structures and buildings (there should be a direct relation between acquiring buildings and structures and the goal of the project),
 - b) machines and devices,
 - c) tools, instruments and equipment,
 - d) technical infrastructure related to the new investment, where construction of technical infrastructure devices is understood as interior installations in technological facilities, media connections to technological facilities, roads and processing areas etc.;
- 3) cost of installing and activating fixed assets;
- 4) costs of purchasing materials or construction works, on the condition that they are directly related to objectives of the supported undertaking;
- 5) purchase of intangible assets and legal assets in form of: patents, licences, non-patented technical and technological knowledge or the knowledge on organisation and management,
- 6) costs of supervision.

9.2 Costs eligible for co-financing from funds provided under GIS subsidies

- 1) cost of purchase or production of new fixed assets, including:
 - a) structures and buildings (there should be a direct relation between acquiring buildings and structures and the goal of the project),
 - b) machines and devices,
 - c) tools, instruments and equipment,
 - d) technical infrastructure related to the new investment, where construction of technical infrastructure devices is understood as interior installations in technological facilities, media connections to technological facilities, roads and processing areas etc.;

² Public aid granted under principles defined in paragraph 6.4 cannot be used for supporting primary production of agricultural products. For that reason, in the case of the applicant using part of the produced thermal energy or electricity for one's own needs related to primary production of agricultural products, the eligible costs will be proportionally decreased. Using part of the produced thermal energy or electricity for one's own needs related to primary production of agricultural products cannot exceed 50% of the produced energy (calculated according to the value of the energy)..

- 2) cost of installing and activating fixed assets;
- 3) costs of purchasing materials or construction works, on the condition that they are directly related to objectives of the supported undertaking;
- 4) purchase of intangible assets and legal assets in form of: patents, licences, non-patented technical and technological knowledge or the knowledge on organisation and management,
- 5) costs of supervision.

10. Examination procedure for applications

1. Applications for co-financing in form of grant are considered in competition mode.
2. Details of the method of proceedings are set out in the rules of the contest.
3. Unregulated matters considering applications referred to in point 1 are governed by NFEPWM internal regulations.
4. Applications for co-financing in form of a loan are considered in continuous call for proposals, subject to points 5 and 6.
5. Application referred to in point 4 is submitted together with the application for co-financing in form of grant, within deadlines published on the NFEPWM website: www.nfosigw.gov.pl
6. The terms defined in the rules of the competition apply to the application referred to in point 4.

11. Other requirements

1. Beneficiary of the co-financing (when awarding procurements) is obliged to apply provisions of the Public Procurement Act (Dz. U. of 2007 No 223, item 1655, as amended), hereinafter referred to as the PPA, in case when he is the contracting party within the meaning of article 3 section 1 of the PPA including the case when conditions mentioned in article 3 section 1 point 5 of the PPA are fulfilled.
2. In case when Beneficiary is not the contracting party mentioned in point ¹, when awarding procurements he is obliged to apply rules of equal treatment, fair competition and transparency defined in article 3 section 3 of the PPA by concluding contracts in writing (unless other form is reserved for a given activity) in form of auction or tender mentioned in article 70¹—70⁵ of the Civil Code.

For Annexes No 1, 3 and 4, refer to the program (in Polish version) on the website <http://www.nfosigw.gov.pl/system-zielonych-inwestycji---gis/programy-priorytetowe/>

Annex No 2

Name of the priority programme:	GIS – Green Investment Scheme Part 2) Agricultural biogas plants							
party to the contract for the sale of assigned emission credits	Planned incomes	distribution of actual incomes	indices of achieving the objective					
	thousand PLN	thousand PLN	product		result		impact – reduction of CO2	
			plan resulting from the provisions of the AAU purchase agreement	amount resulting from concluded grant agreements	plan resulting from the provisions of the AAU purchase agreement	amount resulting from concluded grant agreements	plan resulting from the provisions of the AAU purchase agreement	amount resulting from concluded grant agreements
			MWe	MWe	MWh/year	MWh/year	Mg of CO2/year	Mg of CO2/year
EBOR Ireland-I call	13 500	18 035	3	4,6	26 100	35 334	18 500	36 005
EBOR Ireland – II call*	n.a.	8000	n.a.	1,5	n.a.	10 000	n.a.	8 900
EBOR Spain – I call	22 500	34 284	5	9,1	43 000	66 767	30 500	66 382
Total	36 000	60 319	8,0	15,2	69 100	112 101	49 000	111 287

* Amounts planned