

### 3 Environment

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## 3. ENVIRONMENT

Interaction between the natural environment and the business operations of ENEA Capital Group, especially companies of the "generation" and "distribution" segments have a bearing on the scale and nature of the Company. As such they are also included in the Company's strategy.

### Priority aspects in the environmental area of the ENEA Capital Group:

- emissions of carbon dioxide, energy and its usage,
- water - the scale of its usage and responsibilities associated with the minimization of potential negative impacts on water resources,
- waste management,
- raw materials - mainly used in the main activities of the ENEA Capital Group, i.e. for energy production,
- compliance with the laws in the area of impact on the environment and its protection.

Furthermore, internal analysis of the Company, opinions and expectations of its stakeholders identified **other important issues**. The first one relates to the activities and plans of the Company in the field of renewable energy sources. The second issue concerns the emission of gases other than carbon dioxide and having a significant impact on the environment.

ENEA Capital Group evaluates its impact on the environment, in accordance with Polish law. Then reports information in this field to the relevant regulators and government entities. Moreover, the Capital Group also obeys the international directives and guidelines.

### 3.1. Environmental impact management

Environmental issues affect the shape and implementation of the strategic objectives pursued in 2012 by ENEA Capital Group such as: "Development and diversification of generation capacity", "Development and modernization of distribution networks" and "Provision of technical and technological development." They have been described in the business strategy of ENEA Capital Group realized in 2012.

The Capital Group analyses risks related with the impact on the environment in the context of its business operations. Information about key risks identified by the Capital Group are communicated in the Report of the Management Board on the operations of ENEA Capital Group in 2012 (pages 78-93), including the risks associated with environment protection (page 91).

🔗 The Report is available in the Investor Relations tab of ENEA S.A. website:

[http://www.ir.enea.pl/en/stock\\_market\\_reports/interim\\_reports/enea\\_capital\\_group\\_consolidated\\_annual\\_report\\_for\\_2012/](http://www.ir.enea.pl/en/stock_market_reports/interim_reports/enea_capital_group_consolidated_annual_report_for_2012/)

*Strategy of corporate social responsibility of ENEA Capital Group* is also a strategic document. One of its three objectives is "promotion of environmentally-friendly practices and behaviours."

Each of the ENEA Capital Group companies differ in terms of the scale and nature of their operations. Often, these differences are very significant. Therefore, they implement separate systems for monitoring and management of the environmental impact.

#### IMPLEMENTED MANAGEMENT SYSTEMS

- ENEA S.A. - Environmental Policy
- ENEA Wytwarzanie - Integrated Quality Management System, Environmental, Health and Safety in accordance with the requirements of BS-EN ISO 9001:2009, ISO 14001:2005, PN-N-18001:2004, OHSAS 18001:2007, within: generation and trade of electricity, generation, transmission and distribution of heat
- Elektrownie Wodne - Integrated Quality and Environmental Management based on ISO 9001 and ISO 14001
- Eneos - ISO 9001:2008 norm
- ITSERWIS - ISO 9001:2009 norm
- MEC Piła - ISO 14001 norm
- Elektrociepłownia Białystok - ISO 14001:2004 norm on environmental management.
- ENERGOBUD Leszno - Quality Management System norm according to PN-EN ISO 9001:2001 and PN-EN ISO 14001:2005 norm

## 3.2. Emissions

ENEA Capital Group is operating on the basis of the Polish and EU regulations on emissions. The main regulations include, among others:

- Directive 2003/87/EC of 13 October 2003 establishing a scheme for greenhouse gas emission allowances,
- Commission Decision 2004/156/EC of 29 January 2005 establishing guidelines regarding the monitoring and reporting of greenhouse gas emissions,
- Act of 28.04.2011 on the greenhouse gas emission allowance trading scheme (Journal of Laws No. 122, item. 695).

### Emissions of carbon dioxide

In accordance with applicable legal requirements, monitoring of carbon emissions is carried out in four entities:

1. Elektrociepłownia Białystok,
2. ENEA Wytwarzanie,
3. PEC Oborniki,
4. MEC Piła.

## Emission of carbon dioxide in the companies from "generation" segment" [Mg]

COMPANY	2011	2012
ENEA Wytwarzanie	10 299 069,00	9 925 556,00 (without biomass)
Elektrociepłownia Białystok	485 047,00	331 614,00 (without biomass)
PEC Oborniki	12 420,79	14 859,90
MEC Piła	86 081,00	82149,00

## Emission rate of carbon dioxide in ENEA Wytwarzanie [kg/MWh] in 2010-2012

2010	2011	2012
880	866	839

## Emissions of sulfur oxides and nitrogen

The priorities of the "generation" segment companies, using conventional methods of energy production, is also minimization of the emissions of sulfur and nitrogen oxides. This is due to the need to adapt to the new, more stringent requirements associated with the introduction of industrial Emissions Directive (IED) in 2016.

## Emission of sulfur and nitrogen oxides in the companies from "generation" segment" [Mg]

COMPANY	2011		2012	
	SO <sub>2</sub>	NO <sub>x</sub>	SO <sub>2</sub>	NO <sub>x</sub>
ENEA Wytwarzanie	31 279.00	20 375.00	32 488.00	18 203.00
Elektrociepłownia Białystok	1 353.42	1 389.42	801.00	939.00
PEC Oborniki	65.30	26.94	61.80	29.70
MEC Piła	161.00	73.00	160.43	74.73

### CASE STUDY

#### ENEA Wytwarzanie activities to reduce emissions of sulfur and nitrogen oxides:

- construction of flue gas denitrification system (FGD)
- modernization of pulverized coal burners
- modernization of the electrostatic precipitators of unit 3
- investment in retrofitting refrigerating units in air conditioning systems from refrigerating factor R22 to MO59-21. Thanks to the retrofitting, ENEA Wytwarzanie reduces the use of substances that deplete the ozone layer.

The Company's **plans** related with the expected industrial Emissions Directive (IED), concerns building the fourth desulphurization system and buildings for catalytic denitrification installation in all power units.

### 3.3. Water and raw materials

#### Water

All companies of ENEA Capital Group benefit from water, the natural resource. However, there is a different scale of its use.

In its core business, the companies of “generation” segment use the biggest amount of water. As such they have the greatest impact on the water resources of Poland. In addition, they are the most responsible for protecting its quality. The main source of water supply for the companies is the urban network.

#### Total water withdrawal in the companies of ENEA Capital Group [m3]

COMPANY	2011	2012
ENEA S.A.	5791.28	1969.31
ENEA Operator	93 327.00	111 084.70
ENEA Wytwarzanie	5 222 986.00	7 874 767.00
Elektrociepłownia Białystok	911 536.00	554 571.00
MEC Piła	5 663.00	8 417.70
Elektrownie Wodne	3 726.00	3 599.00*
PEC Oborniki	2 389.00	3 066.50
ENERGOBUD Leszno	1 090.00	2 750.00**
BHU	1 158.00	1 433.64
NZOZ Centrum Uzdrowiskowe ENERGETYK	25 800.00	30 716.00
Energo-Tour	3 523.00	3 628.00
Energomiar	839.00	1 102.00
Eneos	1 219.00	952.38
EP Zakład Transportu	715.00	675.00
ENEA Centrum	no data ***	no data ***
ITSERWIS	936.00	498.00
Hotel EDISON	2000.00	2000.00
Windfarm Polska	-	no data ****

\* data for Płoty, Koronowo and Jastrowie branches. No data for Poznań and Gorzów Wielkopolski branches.

\*\* incomplete data. No data for part of facilities, due to the lack of information from the administrator of rented office spaces.

\*\*\* Not applicable. Settlement based on administrative agreements with ENEA Operator and ENEA S.A.

\*\*\*\* Not applicable. Information included in the water consumption of ENEA Wytwarzanie.

ENEA Capital Group did not record significant penalties related with the environmental impact and its management by the Company in 2012.

## Raw materials

The vast majority of the ENEA Capital Group providers are companies operating on the Polish market. Companies have individual purchasing policies and build, in accordance with them, relations with the suppliers. Suppliers of raw materials for the generation of electricity and heat are key elements of the supply chain from the ENEA Capital Group perspective, scale of orders and environmental impact. Suppliers of "distribution" segment are also significant, including suppliers of equipment and machinery used in the implementation of new projects and renovation of the existing distribution network.

**Hard coal** is the main raw material used by the "generation" segment in the ENEA Capital Group.

ENEA Wytwarzanie consumed 4 716 370.30 tonnes of hard coal in 2012. Furthermore, Białystok CHP used 157 453 tonnes of that raw material in 2012. MEC Piła and PEC Oborniki consumed in total 42 429 tonnes of coal dust. The Capital Group expects that in the coming years hard coal consumption in ENEA Wytwarzanie shall increase. It will be the result of the planned construction of a new power unit with a capacity of 1075 MW.

Lubelski Węgiel „Bogdanka” S.A. is the main supplier of hard coal to ENEA Wytwarzanie. It delivered about 3.3 million tonnes of that raw material in 2012. ENEA Wytwarzanie has also signed an agreement for the supply of coal from suppliers in Upper Silesia, i.e. with Katowicki Holding Węglowy S.A., Jastrzębska Spółka Węglowa S.A. and KHW S.A.

Over 90% of the hard coal supply is delivered to ENEA Wytwarzanie by **rail carrier** PKP Cargo S.A.

ENEA Wytwarzanie also purchased 6985 tonnes of fuel oil in 2012. PEC Oborniki consumed 711,628 of natural gas. Liszkowo biogas power plant consumed around 28 000 tonnes of substrates for biogas production.

Moreover, ENEA Wytwarzanie purchased 294,962.42 thousand of biomass for renewable energy generation. The Company generates energy through the combustion of biomass. These are mainly pellets and briquettes from sawdust and sunflower hulls. ENEA Wytwarzanie had contracts with 15 suppliers of biomass in 2012. 294,658.65 tonnes was consumed from the purchased biomass. Furthermore, Białystok CHP used 279,500 tonnes of biomass in 2012.

### Amount of biomass used by ENEA Wytwarzanie [Mg]

2009	2010	2011	2012
116 736.10	176 510.70	219 302.80	294 658.65

## 3.4. Energy

ENEA Capital Group companies monitor their energy consumption to be more energy efficient. Modernizations and investments in networks operated by ENEA Operator are the major investments in energy efficiency. Value of investment expenditure incurred by ENEA Operator amounted to PLN 895.67 million in 2012.

## Total electricity consumption (MWh)

COMPANY	2011	2012s
ENEA S.A.	1392.280	1058.000
ENEA Operator	34521.324	1599203.000*
Elektrociepłownia Białystok	75632.265	65313.000
Elektrownie Wodne	1811.900	2067.900**
ENEA Wytwarzanie	894047.038	922984.671
MEC Piła	3341.400	3905.000
PEC Oborniki	783.203	766.750
Windfarm Polska	-	7601.988
BHU	541.32***	683.579***
EP Zakład Transportu	80.511	46.560
Energomiar	244.800	260.200
ENERGOBUD Leszno	780.000	740.000***
NZOZ Centrum Uzdrowiskowe ENERGETYK	490.000	483.964
ITSERWIS	0.360	0.395
Energo-Tour	422.694	450.780
Eneos	190,849	177.073
ENEA Centrum	19.130	no data****
Hotel Edison	72.000	72.000

\* 1 558 967 MWh are Company's network losses and 40 236 MWh is used for the Company's own needs.

\*\* No data for Gorzów Wielkopolski branch.

\*\*\* Incomplete data. A part of the Company facilities does not receive a detailed energy consumption data from the administrator of rented facilities, and electricity costs are included in the rent as a flat rate.

\*\*\*\* Settlement on the basis of administrative agreements with ENEA Operator and ENEA S.A.

### CASE STUDY

#### Examples of activities that enable Customers ENEA Capital Group save energy

Eneos: Improvement of the quality and efficiency of street lighting in municipalities: Oborniki Wielkopolskie, Dębno, Opalenica, Słońsk, Goleniów, Kozielice, Ośno Lubuskie, Sulęcín, Gryfice. Modernization of street lighting in Szczecin and Poznań. Photovoltaic installation on the roof of Eneos Szczecin Branch.

Energomiar: Investment in the Integrated Management System-Helios Road Lighting project as a IT platform for intelligent and complex management of roads, streets, cities and municipalities lighting.

### 3.5. Waste

The Company gives away hazardous waste to authorized companies. In addition, ENERGOBUD Leszno recycles transformer oil. Thanks to that, 390 tonnes of oil was recycled in 2012.

#### Waste by type of waste [Mg]

COMPANY	2011		2012	
	Hazardous waste	Other than hazardous waste	Hazardous waste	Other than hazardous waste
ENEA S.A.	-	-	0	64.140
ENEA Operator	-	-	556.000	4604.000
Elektrociepłownia Białystok	0.817	35637.500	0.400	29 736.000
Elektrownie Wodne	3.496	132.711	5.474	23.232
ENEA Wytwarzanie	87.091	1 042 287.200	87.241	1 042 077.300
MEC Piła	0.700	6 493.860	1.720	7 849.321
PEC Oborniki	-	-	1 090.271	no data
BHU	-	-	6.343	9.244
EP Zakład Transportu	-	-	3.007	3.228
Energomiar	-	-	0.0076	144.048
ENERGOBUD Leszno	-	-	589.000	787.000
NZOZ Centrum Uzdrowiskowe ENERGETYK	-	-	0.050	27.500
ITSERWIS	-	-	0.500	0.294
Energio-Tour	-	-	no data	no data
Windfarm Polska	-	-	0	0
Eneos	-	-	3.703	124.599*
ENEA Centrum	-	-	0	no data
Hotel Edison	-	-	0	20.000

*In 2011, "generation" segment data were reported. In 2012, reporting was expanded by other companies.*

*\* Data in accordance with the Waste Transfer Note. Moreover, the Company estimates that it generated municipal waste in quantities of 190 300 liters (estimated on the basis of volume of containers and the frequency of their disposal).*

### 3.6. Renewable energy sources

ENEA Capital Group obeys in its operations binding in Poland guidelines and laws for the sale of energy from renewable energy sources (RES) and cogeneration. A continuation of signing a long-term contracts is planned, for the purchase of certificates confirming generation of electricity from renewable energy sources and cogeneration, from third parties.

ENEA Capital Group plans to increase generation capacities based on renewable energy sources. According to the implemented in 2012 strategy, the Capital Group aims to achieve 250-350 MW of installed generation capacity in wind by 2020. Further investments in generation capacity based on biogas are also planned.

In line with corporate strategy implemented in 2012 ENEA Capital Group also invested in modernization of the acquired thermal power stations turning them into heat and power plants. These use, among others, biomass and generate electricity from cogeneration.

**ENEA Capital Group installed capacity in renewable energy sources is 198.5 MW. Out of which 78.5 MW is biomass. Capital expenditures of ENEA Capital Group, associated with renewable sources, exceeded 355 million PLN in 2012.**

## Energy generated from RES and cogeneration in MWh

SPECIFICATION	2010	2011	2012
Energy generated from RES, for which Hydropower plants receive green certificates of origin	155 239.305	160 479.361	151 209.813
Amount of production and number of certificates of origin from the biogas plant Liszkowo	7 451.976	6 175.880	1 826.680
Gross electricity generated by the biogas plant Liszkowo for which DOBITT Energy has received green certificates of origin	-	-	2,636.088
Energy generated by the Wind Farm Darżyno for which the Company Elektrownie Wodne received green certificates of origin	-	12 918.996	16 410.336
Electricity generated in RES generation unit of Elektrociepłownia Białystok	114 027.455	194 269.865	160 000.671
Electricity generated in cogeneration CHP unit of Elektrociepłownia Białystok	461 385.110	464 440.926	391 532.895
Electricity generated from RES in ENEA Wytwarzanie thanks to installation of biomass co-firing (Green certificates)	319 150.283	393 078.915	518 565
Electricity generated in ENEA Wytwarzanie from cogeneration (Red certificates)	65 982.939	55 601	61 077
Gross electricity generation by wind farm belonging to the Windfarm Polska.	-	-	121 914.344

ⓘ Detailed information on the obligations of companies in the energy industry within obtaining certificates of origin is enclosed in the Management Board on the operations of ENEA Capital Group in 2012 (p. 69-72): [http://www.ir.enea.pl/en/stock\\_market\\_reports/interim\\_reports/enea\\_capital\\_group\\_consolidated\\_annual\\_report\\_for\\_2012/](http://www.ir.enea.pl/en/stock_market_reports/interim_reports/enea_capital_group_consolidated_annual_report_for_2012/)

Electricity from renewable sources is generated by the following companies:

- ENEA Wytwarzanie, biomass co-firing with conventional fuel (hard coal),
- Elektrociepłownia Białystok, cogeneration of electricity from biomass,
- Elektrownie Wodne (21 hydropower plants, Darżyno wind farm)
- Dobitt Energia (Liszkowo biogas power plant belongs from October 2012 to Dobitt Energia company)

- Windfarm Polska (Bardy wind farm).

**Elektrociepłownia Białystok** completed conversion of the other coal-fired boiler to fluidized-bed boiler type BFB - powered by biomass in 2012. It significantly boosted its generation capacity based on renewable energy sources.

Currently, in Białystok CHP generation capacity from renewable energy sources amounts to: thermal energy generated from renewable energy sources - 98.4 MWt, energy generated from renewable energy sources - 56.6 MWe.

To maximize energy generation from renewable energy sources, Białystok CHP uses the so-called condensing turbine TZ4. It is powered by bleeding steam turbine CHP TZ1 of a pressure of 1.0 MPa.

**Elektrownie Wodne** company is responsible for the development of projects in the field of wind energy. In February 2013 Elektrownie Wodne received permission to build a wind farm Baczyzna of 15 MW. The new plant is scheduled for the first quarter of 2014.

Remaining 27.5 MW in a group of own projects managed by Elektrownie Wodne, is a Choszczno wind farm. Its construction is planned for 2014.

The Company is also developing a pilot photovoltaic farm with a capacity of 1 MW, located in Jastrów. Its commissioning is scheduled for the end of 2015.

The Company is also interested in Złotów wind farm with a capacity of 12 MW. Its launch is expected in 2014.

25 wind turbines with a total capacity of 50 MW are the basic units of electricity generation from renewable sources in the **Windfarm Polska** company. Windfarm Polska commenced generation of energy from a licensed source on 29 February 2012.

## Generation by ENEA Capital Group of electricity (net) from renewable energy sources [GWh]

	2011	2012	CHANGE [%]
Biomass co-firing	392	519	32.1%
Biomass firing	102	131	28.4%
Hydropower plants	158	149	- 5.7%
Wind farms	13	100	669.2%
Biogas power plants	6	2	- 66.7%

An important role is played by an independent operator - **ENEA Operator** Company in the development of renewable energy sources in Poland.

According to the Energy Law, ENEA Operator is required to conclude agreements for connection to the distribution network of entities applying for such connection. Meeting the technical and economic conditions of connection is required. Entities applying for the connection must also meet the conditions for connection and acceptance of energy.

Network availability for all current and potential users of the distribution network and the scale of connecting renewable energy sources depends on the efficiency of ENEA Operator activities.

ENEA Operator plans to spend more than PLN 600 million for connecting renewable energy sources to the distribution network of ENEA Operator.

🔗 Detailed information about investments carried out by ENEA Operator and investments subsidized by EU funds within RES connections to the distribution network are available at ENEA Operator website: <http://www.operator.enea.pl/22/info-o-sieci/inwestycje-unijne-1063.html>.