



# **Report**

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**on wastewater pollution management in Poland**

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**January 2008**

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### 1. Foreword

Poland, inhabited by 38.2 million people plays a crucial role in Baltic Sea catchment area in a scope of water eutrophication. Average population density is 122 capita per km<sup>2</sup> and ranges up to 600 in some agglomerations. 14.7 Mln people (38.6% of all population) live in the countryside in scattered settlements; the number of populated sites is over 40 000!

The 99.7% of territory of Poland belongs to Baltic Sea catchment area with two main river basins of Vistula and Odra discharging their waters to this sensitive sea. The coastal zone is inhabited by about 10% of the country's population and is home to a variety of economic activities linked to shipbuilding, fisheries and marine transport, chemical industry and tourism.

The reduction of N & P nutrient targets for Poland would be of the great importance to Baltic Sea environment and would improve the poor status of biodiversity of the Sea. However, when expressed per inhabitant or area unit, Poland's contribution of nutrients to the Baltic Sea is one of the smallest ones among Baltic countries.

Since 2004, when Poland entered EU community - the adoption of European standards into Polish legislation has become a challenge both for economy development and to recovery of environmental status.

Recognizing the importance of municipal sewage as a point source of pollution for the marine environment - the improvements in wastewater management in Poland are the important measures to diminish the nutrient load from water-born sources in Baltic Sea catchment.

This report aims to describe the situation in wastewater management in Poland after 4 years of implementation of *National Urban Wastewater Treatment Program* and nearly 4 years' membership in EU.

The moment of the analyses and report is chosen just after voluntary obligations in nutrient reduction undertaken by Poland, altogether with other Baltic Sea region states contracting HELCOM *Baltic Sea Action Plan*.

The analyses are made by Polish Ecological Club – one of the oldest Polish environmental organization, that has been monitoring the environmental legislation and measures undertaken by central and local authorities in scope of wastewater management since the beginning of 90-ies.

PKE has also been an active member and partner of Coalition Clean Baltic since 1995.

### 2. Water Law regulations in Poland in order with EU Accession Treaty obligations

EU legislation concerning the wastewater collecting, treatment, monitoring and discharge is determined by The Council Directive 91/271/EEC adopted on 21 May 1991 by European Community (Official Journal L 135, 30/05/1991 p.0040–0052). Its objective is to protect the environment from the adverse effects of urban wastewater discharges from:

- Human settlements
- Certain industrial sectors (agro-food industry, food processing..)
- Agglomerations of >2000 p.e. (waste-waters' mixture both from households and industry).

Poland has introduced the standards and requirements of the Directive into some legal acts, in the process of harmonization of Polish environmental law with Community environmental law basing on global principle of sustainable development.

The most important legislations concerning wastewater management are:

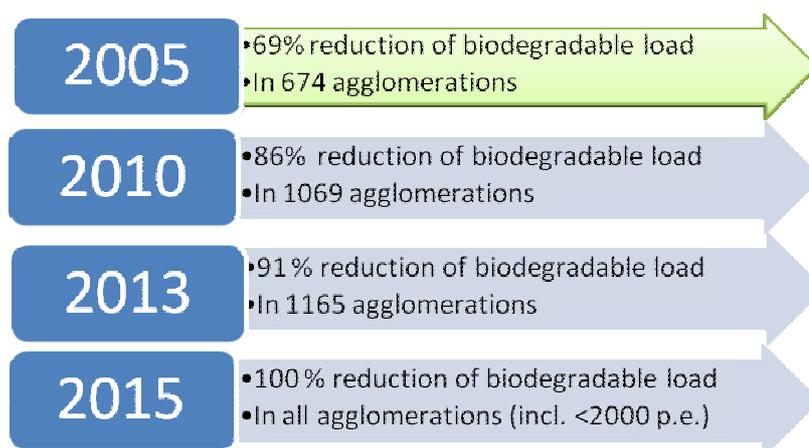
- ❖ *Act on Water Law of 18 July 2001*
- ❖ *Act on Protection of Environment of April 2001*
- ❖ *Act on Collective Water Supply Systems and Waste water discharge of 7 June 2001*
- ❖ *Act on Wastes of April 2001*
- ❖ *Regulation of Ministry of Environment on conditions of discharges into water and soil.. of July 2006*

The implementation of Council Directive 91/271/EEC is **assigned to local governments** (so called *gminas*) by *Act of Local Governments*, which poses responsibilities for water and wastewater issues on local authorities as their own task. *Gminas* can charge Water Companies with this specific task of building and operating networks and systems for water and wastewater management to supply the public services on their territory.

The coordination of the programs and measures in wastewater collective networks in Polish agglomerations is the duty of Ministry of Environment, which is responsible, on behalf of the Government for fulfilling the obligations resulting from the Accession Treaty within the scope of urban wastewater discharge and treatment.

The requirements of Accession Treaty are going to be fulfilled in stages, which are set up for Poland in scope of wastewater treatment in the way as shown at the following figure.

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In 2006 under Act of Water Law, National Water Management Board was established to play this coordination task on behalf Ministry of Environment. Furthermore, this Board is also assigned to be the Implementation Authority of national “**Infrastructure and Environment**” Operational Program for 2007 - 2013 for Axis III “**Resources Management and Protection of Environment**”.

National Water Management Board is responsible for implementation of EU Water Framework Directive altogether with seven Regional Boards of Water Management. The aim of WFD implementation is to gain **good ecological status** of all water bodies by 2015, introducing the river basin approach as a management rule. The requirements of WFD were incorporated into Polish Act of Water Law and the timetable of implementation has been executed precisely for 6 years now , since the Act has passed.

At the end of 2007 the second phase of public consultations has started, concerning the substantial problems at the river basins. At the end of 2008 The Water Environment Program of the Country is going to be finished and announced.

The final objectives of the WFD implementation would have been Water Basin Management Plans to be presented to EC in the middle of 2010 due to the strict timetable.<sup>2</sup>

### 3. Major threats and priorities of wastewater management system in Poland

#### 3.1 Nutrient pollution loads generated in Poland (2005)

The data presented in this part of report comes out from the booklet “*Gospodarka ściekowa w Polsce w latach 2004 – 2005*”<sup>3</sup> edited in 2007 by National Water Management Board, on the

<sup>1</sup> Poland has achieved the demanded standards in wastewater treatment in one year's delay - in 2006, the average reduction rate of biodegradable pollution load was 69.3% in 883 agglomerations

<sup>2</sup> The public consultations of WBMP would start on Oct.2008 and go on 12 months. This report on wastewater management problems will be a useful tool for NGO's in this process.

<sup>3</sup> “*Water Management in Poland in 2004 – 2005*”

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freedom of access to information rule. The edition and spreading the booklet was made within the first stage of public consultations on implementation of Water Framework Directive in Poland.

The following definitions, formulated in Urban Waste Directive 91/271/EEC article 2. are necessary to explain the meaning of data presented below:

„**agglomeration**” = sufficiently concentrated settlement area and /or area of economic activity for urban wastewater to be collected and conducted to an urban wastewater treatment plant or to a final discharge point

“**population equivalent**” (p.e) = organic biodegradable load having a five-day biochemical oxygen demand (BOD5) of 60 g of oxygen per day

The table No. 1 shows the quantity of biodegradable load generated in Polish agglomerations in 2005, calculated for the purpose of strategic planning in this sector.

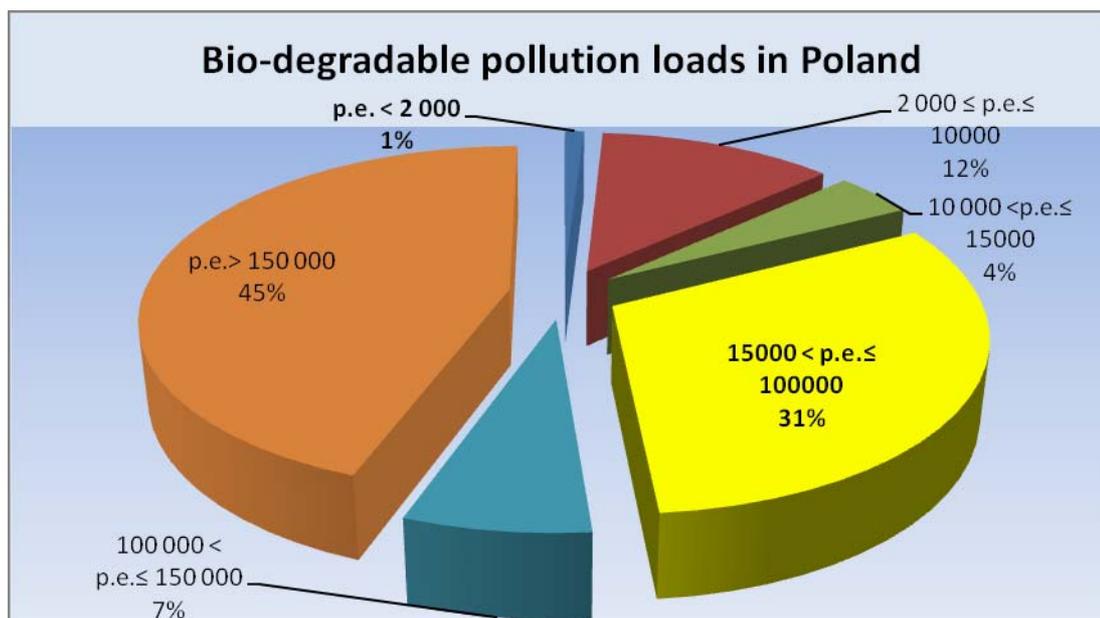
**Tab. 1 Number of agglomerations in Poland and population equivalents (2005)**

Class of Agglomeration respectively to p.e	Number of agglomerations	p.e. assigned to the class of agglomeration	% of total biodegradable pollution generated	Comments
	381	442 742	1	Estimations of the Program <sup>4</sup>
	973	5 482 292	12	
	150	1 866 726	4.2	
	<b>378</b>	<b>13 947 043</b>	<b>32.2</b>	<b>Priority for 2007-2013</b>
	25	3 059 208	6.7	
	51	19 875 667	44.5	
	<b>1 956</b>	<b>44 675 209</b>	<b>100</b>	

Due to the official statement of National Water Management Board presented in the booklet “*Water Management in Poland in 2004 – 2005*”- “...large towns pose a major threat to the quality of water: 198 towns with a daily discharge exceeding 3 500 m<sup>3</sup> each, produced ~ 75% of total amount of urban wastewater countryside, including almost 8% in the form of untreated wastewaters”.

<sup>4</sup> data taken from Project „Program for providing agglomerations below 2000 p.e. with wastewater treatment plants and sewerage systems.”

Lets' analyze the following figure:



- 83% of biodegradable pollution loads come from 454 agglomerations of  $\geq 15\,000$  p.e. of which almost 2/3 from 76 agglomerations are of  $\geq 100\,000$  p.e.
- The considerable high pollution load (**31%**) is generated at 378 agglomerations of over 15 000 population equivalent but below 100 000 p.e. It is going to be the **priority objective** for national Operational Program 2007 – 2013 “Infrastructure and Environment” co-financed by EU Structure Funds
- 16% of biodegradable pollution loads in Poland comes out from agglomerations  $15\,000 \geq p \geq 2\,000$
- 1% load of biodegradable pollution for agglomerations  $< 2\,000$  p.e. is definitely underestimated keeping in mind that the number of agglomerations in this “class” is over 39 000 with 14.7 mln inhabitants. This low rate in the pollution “pie” is calculated only for those 381 agglomerations chosen and enclosed in the nationally coordinated and financed Program for providing agglomerations below 2000 p.e. with WWTP and sewerage systems of 2005 and does not cover all population living in small settlements! This data shown in officially edited materials is misleading for the public and diminishing the problem among decision-makers.

There are no data available from National Water Management Board for the smallest agglomerations  $< 300$  p.e., which should be also a goal of wastewater management due to the latest obligations signed up by Poland on 15 Nov. 2007 with Baltic Sea Action Plan agreement. The small settlements /households in Poland produce considerable high quantity of the biodegradable pollution load (respectively to the population living there **~40% of total**), spread out in the countryside.

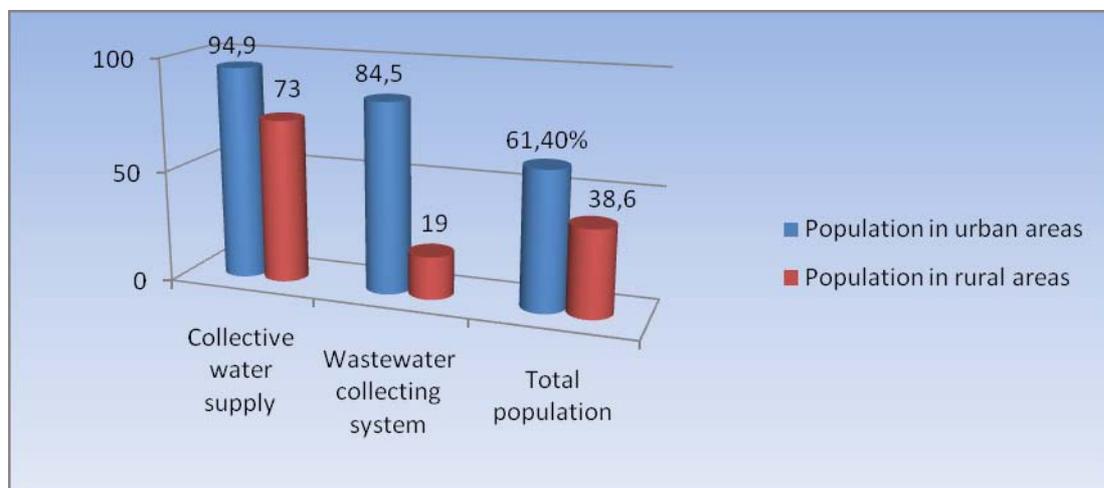
The number of the scattered settlements in Poland will grow in the future (due to the trend of residential buildings in the country side) and the **problem would arise**.

The market for single-house wastewater treatment plants will grow in Poland as well as for sustainable sanitation ideas. The requirements for new-built houses are now more severe in some *gminas* especially located on sensitive areas, health resorts, *NATURA 2000* areas, depending on local authorities' law.

### 3.2 Development of urban infrastructure for point sources of wastewater pollution

Connections of households with the collective sewerage systems and the level of treatment of wastewaters is an indicator of the water management status of the country. In 2005 water supply systems (water networks) have covered needs of potable water of **94.9%** inhabitants of towns and **73%** in rural areas as shown at the drawing. Collective wastewater discharge system has provided services to **84.5 %** of inhabitants of urban areas and only to **19 %** of inhabitants of the rural areas.

**Distribution of water and wastewater services in urban and rural areas (2005)**



Although after the downfall of communist regime, in 90-ies it has been done some improvements in urban and rural infrastructure (increase of sewerage services by 3% in towns and 17,3% in rural areas) but they were too slowly to meet the European standards.

Due to the statistics<sup>5</sup>, in 2005 all agglomerations of  $\geq 15\ 000$  p.e. were equipped with collective sewerage systems, whereas out of 1123 agglomerations ranging 2000 – 15 000 p.e. only 121 were lacking those systems. These centralized systems covered 22,9 mln people i.e. 60% of population of Poland, living in 98% of agglomerations  $\geq 2000$  p.e. Most of the wastewater treatment plants in towns were modernized or build in last 15 years, to meet the desired standards of reduction of biodegradable load.

The Progress in construction of centralized wastewater treatment plants in urban areas of Poland (1990 – 2005), is shown below at table No 2

<sup>5</sup> Data from the 2006 Statistical Yearbook of the Republic of Poland

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**Tab No 2** Wastewater Treatment Plants operating in urban agglomerations

Items	1990	1995	2000	2004	2005
Number of towns	830	860	880	886	887
WWTP operating in towns	566	793	965	956	949
Population using the systems (in thousands)	-	15 555	18 928	19 829	19 955
% of total population in towns	-	65,7	80,0	84,0	84,5
Population using WWTP with nutrient reduction (in thousands)	-	1 110	7 329	11 832	13 090

Although In 2005 - **8%** of discharge from the large towns were **untreated (!)** wastewaters, but the construction of brand new treatment plants for three big cities (Kraków, Szczecin under construction and Warszawa - South WWTP has just started the operation), will considerably improve the situation. The new or modernized WWTP has been equipped with modern **N, P** nutrients reduction installations, which is the significant progress. In 2005 **55.8%** of urban population discharged wastewaters to such extended WWTP.

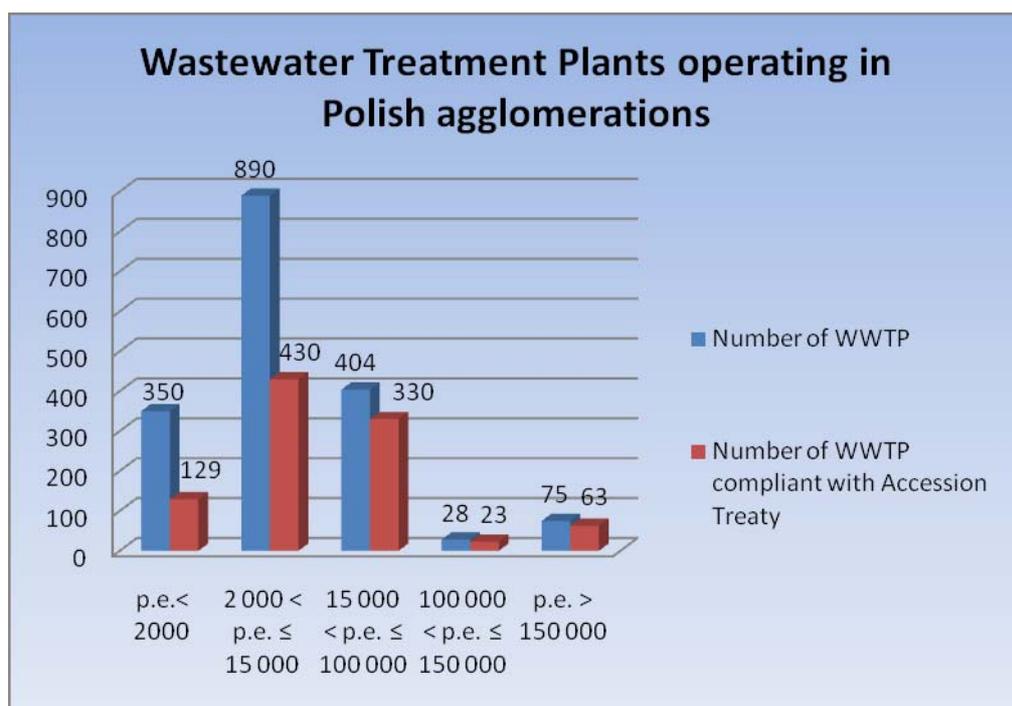
The following table No 3 and the figure will show if and to what extend Waste Water Treatment Plants operating in Poland are in **compliance with EU requirements** / Accession Treaty obligations.

**Tab No 3.** The reduction of Biodegradable Pollution Load at WWTP in Poland:

Class of agglomeration respectively to p.e	Number of WWTP in operation	No of WWTP compliant with Accession Treaty	Reduction of biodegradable pollution load (thousands p.e.)	Average reduction of bdg. pollution %	Pollution load discharged from WWTP (thousands p.e.)
p.e. < 2000	350	129	No data	Not estimated	< 1%
2 000 ≤ p.e. ≤ 15 000	890	430	2 331.7	70	5 329.8
15 000 < p.e. ≤ 100,000	404	330	8 106.4	85	5 528.1
100 000 < p.e. ≤ 150,000	28	23	16 957.0	85	5 977.9
p.e. > 150 000	75	63			
Total	<b>1747</b>	<b>975</b>	<b>&gt;27 395.1</b>	62	<b>16 835.8</b>

The compliance with Accession requirements has improved significantly in the big towns over 100 000 p.e. but is still poor in smaller agglomerations (≤ 15 000), where only 48 % of the wastewater treatment plants met the standards. Most of these treatment plants are being extended or modernized now to show up the progress in wastewater management in the next stage by 2010.

The assessment showed that size of treatment plants is larger than capacity of the receiving and transmitting sewerage systems, except for a group of agglomerations above 100 000p.e.



These statistic data do not cover information of wastewater treatment plants operating for industrial plants which also maintain some sewerage discharges from nearby dwelling-places, which was popular in communist era. Generally speaking the analyses show, that the capacity of wastewater treatment plants are even bigger than the output of the sewerage systems in urban areas of Poland (as the drop of water consumption was observed due to cost increase). The needed upgrade for WWTPs are often the installations for N,P reduction, which are costly enough both for investment and operation.

The worst situation shows in small settlements below 2000 p.e. inhabited by 14.7 mln inhabitants.

Due to information described in “*Sustainable Sanitation in Central and Eastern Europe – addressing the needs of small and medium-size settlements*” edited in 2007 by Global Water Partnership CEE, the dominant process (cover around **75%** of rural population) in small settlements of CEE (including Poland) is still the use of cesspools, which serve as the pre-stage of wastewater treatment. This is very imperfect process of treatment but mostly of accumulation role. The cesspools are often overflowing or leaking and contaminating the ground waters.

Low-cost, natural wastewater treatment methods (wetlands, sand-soil-reed filters, lagoons and wastewater irrigation systems) are used sub-marginally in some areas of Poland, but they are disappearing now as out-of-date, wrongly dimensioned or with bad operation and maintenance. Sometimes they serve as tertiary stage of the treatment.

There is still a huge infrastructure gap between urban and rural areas in Poland and urgent need for the sustainable sanitation systems to be built in the small villages.

### 3.3 Problem of sewage sludge utilization in Poland

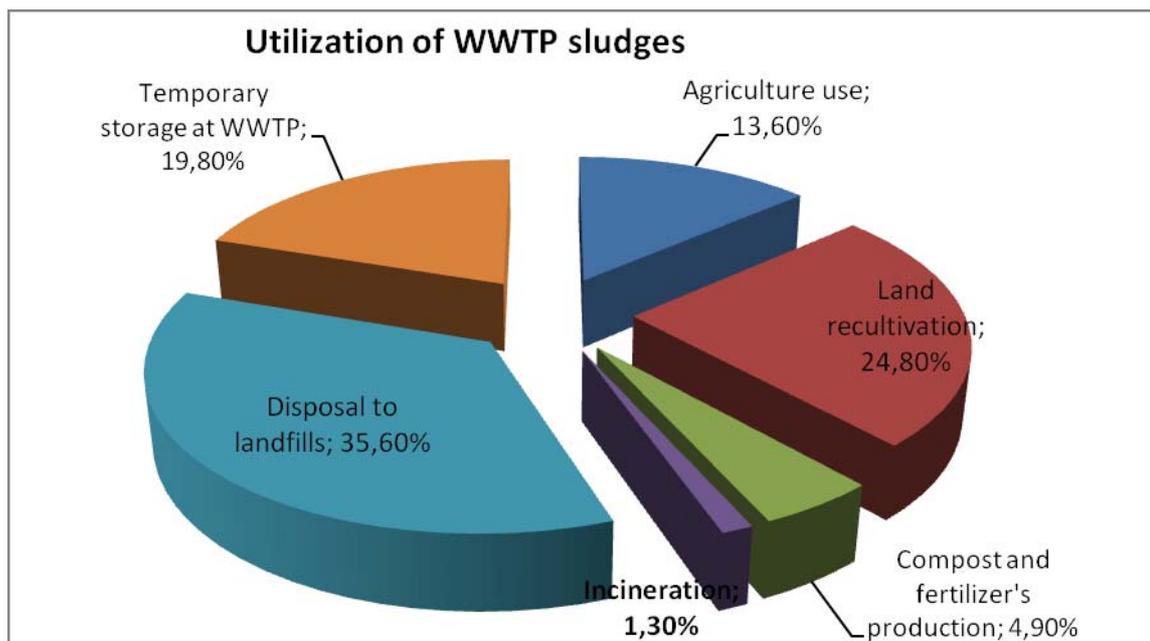
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Official statistics report the total amount of sludge produced in Polish WWTP in 2005 was :  
486,1 thousands of tons per year.

The highly concentrated load of sludge from WWTP rises year by year by around 5 – 10% (in 2000 there were 359 800 tons) and becomes one of the most severe problems nowadays for WWTP operators as Poland have to obey EU directives and standards.

The unit average index of sewage sludge generated in Polish urban wastewater treatment plants is 0.25 kg d.m./m<sup>3</sup> of treated wastewater.

According to official statistics around 50% of sewage sludge is produced in WWTP servicing 76 big agglomerations of  $\geq 100\,000$  p.e. causing serious and growing problems with its management in environment. The ways of utilization in 2005 is shown in the following figure.



According to urban wastewater directive the sludge originating from wastewaters treatment should be reused wherever it is possible. Land-filling is on the last place on the waste hierarchy after the prevention, recycling and recovery, having in mind the general aim of minimization the quantity of biodegradable waste going to landfill up to 50% by 2013. The land-filling of WWTP sludge is forbidden according to Polish law (if the  $C_{org}$  exceeds 5%). Comparing to the situation in 90-es, the volume of sludge disposed nowadays to the landfills has been considerably diminished although is still too high.

Agriculture use of sludge is also limited by health restrictions of heavy metals presence in sludge from WWTPs at urban areas (due to agriculture directive 86/278/EEC). There are also special restrictions for sludge utilization inside “vulnerable zones” and outside of them because of protection of surface and ground waters from nitrate pollution (Dir. 91/676/EEC). An important obstacle for the possibility of reusing the sludge on eco-label farmland (production of organic food) is the eco-label regulations.

The **incineration** of sludge from WWTP with heat recovery is one of the options, although ash utilization (up to 40% in volume) becomes another problem as well as gases' emission in urban environment.

The new technologies of drying up the sludge into the granulate with second stage of thermal conversion into glass (vitrification), utilized for construction purposes were demonstrated during the seminar for local governments and WWTP operators that took place in Jan.2008 in Gliwice (Upper Silesia). The vitrification process (*GLASS PACK*), implemented already in

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Fox Valley, US was recommended for urban or regional WWTP as the most desirable and energy efficient method for safe utilization and recycling of WWTP sludge.

There are two important obstacles for implementation of this method in Poland: the public opinion and money. To solve the problem of thermal treatment of sludge *gminas* should agree for a common investment, sharing costs and responsibility for operation of *high-tech* incineration plants (with minimized effects to environment), dealing with public concern and prejudices against combustion plants.

#### 4. Implementation of programs for municipal wastewater treatment (2007 – 2015)

The implementation of measures necessary to accomplish demanded standards of wastewater treatment, recorded in Accession Treaty for Poland is being carried on under the programs listed below in the table No 4.

**Tab No 4**

<b>Program</b>	<b>Period of implemt.</b>	<b>General data</b>	<b>Estimated costs in mln PLN / mln Eu</b>	<b>Stakeholders: Coordination / Investors</b>
<i>National Urban Wastewater Treatment Program p.e.≥2000</i>	2003 – 2015	1577 agglomerations 37 thousands km of sewerage canals 1700 wastewater treatment plants	42 642 / 11 845mln Eu  (1 Eu = 3,6 PLN)	National Water Management Board / Regional and local governments and their associations, water companies/enterprises
<i>The Program for providing agglomerations below 2000 p.e. with WWTP and sewerage systems</i>	2007 - 2015	379 agglomerations 221 WWTPs to be extended or modernized 29 new-built WWTP 1 241 km sewerage c	819 mln PLN / 227 mln Eu	National Water Management Board / <i>gminas</i> , water companies, Regional Funds for Environmental Protection
<i>Agro-Food Industry (p.e.≥4000) Program</i>	2007 - 2010	p.e. = 2 932 090 63 enterprises complied with standards; 51 non-complied;	154 mln PLN / 42.8 mln Eu	Regional Boards of Water Management & Local Governments / Agro Food businesses

- ❖ **The National Urban Wastewater Treatment Program p.e.≥2000**, approved by the Council of Ministers in December 2003 is major and the largest with regard of investment and cost among all the tasks resulting from the implementation of the EU directives. It will require over 42 billion PLN / ~12 billion Euro until 2015. It is going to be implemented in 1577 agglomerations ≥ 2000 p.e. resulting in building of 37200 km of collecting channels and modernization of 1700 treatment plants in the period of 12 years. The Program has been up-dated in June 2005; the number of agglomerations has been extended from 1378 up to 1577, mostly the smaller ones (p.e. < 15000) by 19%, the cost has increased by over 20 % mainly for construction of collecting channels (sewerages). The Program has to be monitored every two years and up-dated by National Water Management Board. The reporting procedure to EC is regulated by art. 17 of Dir. 91/271/EEC; actually the organizational system of monitoring and reporting from *Gminas* to NWMB is under construction. The report to EC (with 1 year delay) is expected by the end of 2008.

- ❖ **The Program for providing agglomerations below 2000 p.e. with WWTP and sewerage systems** was prepared in accordance with art. 7 of Dir. 91/271/EEC. It

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covers 379 agglomerations < 2000 p.e. of total load 444 273 p.e.; 129 WWTP are in compliance with EU standards, 101 must be modernized, 120 WWTP will be extended and modernized. In 29 agglomerations the new WWTP shall be built. 1240 km of new-built sewerages will collect wastewaters of 152 thousands new users. The objective of the Program will be fulfilled by implementing individual projects with support of the ERDF as part of the 16 *Regional Operational Programs*. The cost of projects is limited up to 4 mln PLN by the rules of *Rural Areas Development Program (Axis No3 –Substantial services for rural population)*; the range of p.e. must not exceed 5000 for this source of financing. *Gminas* may also apply for additional funding from 16 Regional Funds for Environmental Protection respectively to the location. This Program is going to be up-dated after analyzing the reports from *gminas* in the middle of 2008 by National Water Management Board and will be implemented up to 2015.

- ❖ **Agro-Food Industry (p.e.≥4000) Program** is also fulfilling the recommendations of Dir. 91/271/EEC in scope of its discharges of biodegradable pollution loads directly to surface waters. The program identifies the investment needs of installations for biological and chemical treatment of sewerage and management of sludge from WWTP as well as pollution prevention. The program identifies 114 plants of food-processing sector (diary, brewery, malting, fruit and vegetables industry) equipped with WWTP of 99% efficiency; 51 plants need to be modernized with the investment cost estimated by 154 mln PLN / 43 mln Eu. “End-of-pipe” measures will consume 2/3 of total investment cost. The program is planned for implementation in the period 2007 - 2010. Individual projects will be financed from the budgets of enterprises’ owners, mostly of private capital.

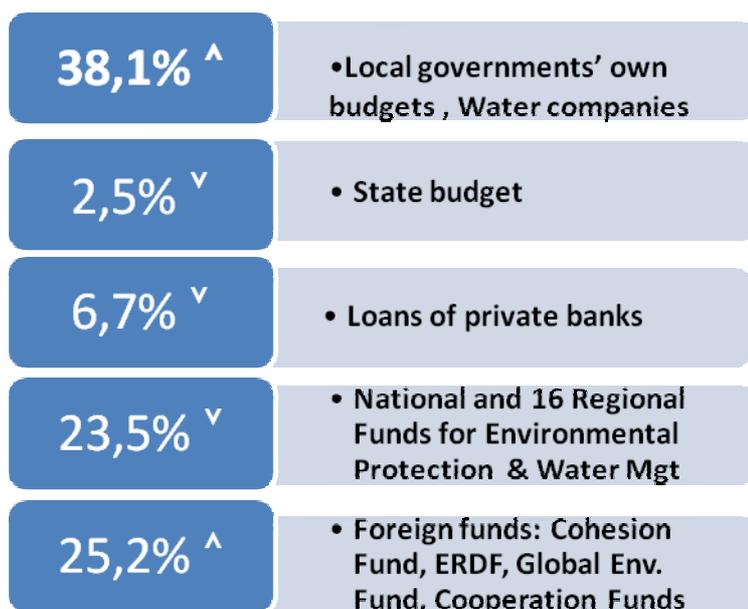
### 5. Financial issues of implementation

Implementation of all technical measures planned for wastewater management imposed a enormous organizational and financial effort on national, regional and local authorities. The support of ERDF and Cohesion Fund demands to preserve some strict rules, regulations and financial standards on every stage of investment process: planning, organization, tendering, engineering, monitoring as well as on reporting and final clearing. The education and training of human resources on that specific issue of project management on every level is the crucial point for the successful implementation of all programs and thousands of projects.

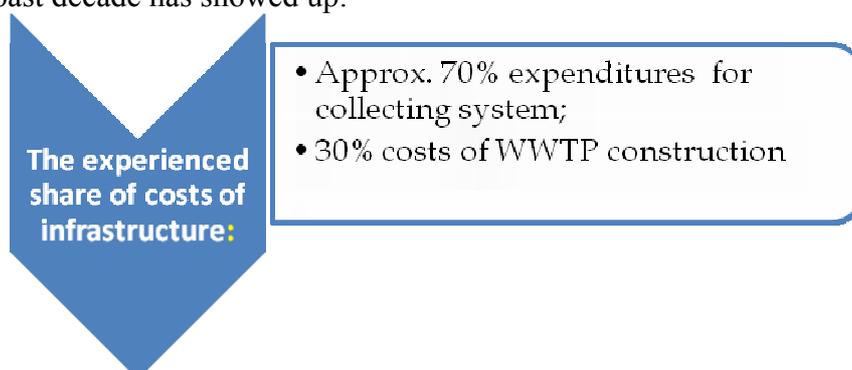
Poland has been practicing all this organizational and financial management skills in the period of 2004 – 2006, just after EU accession but the challenge of available funds was incomparable lower to the new possibilities for 2007 - 2013. The effectiveness of utilization of Structural Funds available for Poland in 2004 – 2006 was around 70% at the end of 2007 – over **6 bln Euro** was transferred for about 53 thousands of projects (!), cleared up to the end of 2007. Poland has taken the 5<sup>th</sup> place in utilization of Structural Funds among 10 new member states.

Within the Operational Program “Infrastructure and Environment” the planned amount of money for water management in the period of 2007 – 2013 ranges up to **556.8 mln Euro** from ERDF and Cohesion Fund and **98.2 Euro** from Polish public funds (15% of national share). Investment expenditures for municipal wastewater management have been reported in 2005 in presented below share of sources:

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Two main sources of investment funds were: *gminas* ' (local governments') own public money and Structural Funds of EU, which has increased essentially in period of 2002 – 2005 (from 3.2% up to 25.2%). At the same time the share of state budget and bank loans has dropped below 10% as well as the input of national and regional environmental funds has slightly diminished. The experienced structure of expenditures in municipal wastewater investments in the past decade has showed up:



Also the planned resources for implementation of *National Urban Wastewater Treatment Program in 2005 – 2013* were predicted likewise; even more money (up to 89.3%) should be spent for collecting systems in agglomerations of less populated density (see tab No 5).

**Layout of financial resources planned for *National Urban Wastewater Treatment Program***  
**Tab No 5**

Purpose of expenditures	Period of expenditures				
	2005	2006 - 2010	2011 - 2013	2014 - 2015	Σ 2005 - 2015
Financing of collecting systems in mln Eu /%	797.0	5 644.9	1 221.3	1 261.9	8 925.3
	72.8 %	72.6 %	89.3%	78.5 %	75.3 %
Construction & modernization of WWTP In mln Euro	296.7	2 130.9	147.1	345.1	2 919.9
	27.2 %	27.4 %	10.7 %	21.5 %	24.7 %

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Total mln Euro	1093.7	7 775.8	1 368.4	1 607.0	11 845.2
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The higher share of expenditures for collecting systems after 2010 is justified by the priority of planned measures.

In the period 2005 – 2010 the investment activities are planned primary for bigger agglomerations  $\geq 15\ 000$  (82% of all costs). Otherwise in the period 2011 – 2015 the projects will be implemented in smaller agglomerations  $2\ 000 \leq \text{p.e.} < 15\ 000$  where the collecting system are much more expensive comparing to WWTP modernization costs.

The strategy of expenditures for implementation of the major wastewater Program base on the rule of cost effectiveness of pollution load reduction what is in proportion to density of population in agglomerations. The relations between:

agglomerations  $\leftrightarrow$  p.e  $\leftrightarrow$  investment cost

can be easily seen in the **table No 6**

The group of agglomerations	Number of agglomerations %	p.e. %	Share of all cost %
$\geq 100\ 000$	5	52.8	42.2
$\geq 15\ 000 < 100\ 000$	23	31.0	29.8
$\geq 2\ 000 < 15\ 000$	72	17.2	28.0
<b>total</b>	100	100	100

Large agglomerations  $> 100\ 000$ , which pose the major threat to water pollution “producing” over half of biodegradable load (52.8%) will use over 42% (~5 bln Euro) of all financial resources planned to cope with the problem. The smallest agglomerations in the Program, responsible for less than 20% of pollution will get less than 30% of financial resources.

This relations do not cover all participants of the process; the programs deal only with public funds – national and foreign but not the private ones!

According to the official information of National Water Management Board, expressed in the booklet <sup>(3)</sup>, the **private expenses** were as much as **87%** of all public financial disbursements for water and wastewater management investments in 2005.

The private funds, demanded as so called “own share” when applying for external funding must have ranged up to 800 mln Euro in 2005, what is a significant input for investment process. Those money could be to some extend more flexibly spent for cheaper, sustainable sanitation technologies introducing the idea of wastewater nutrients’ recycling in poor rural areas.

### 6. Baltic Sea Action Plan – voluntary obligations of Contracting States

The urgent need to take an action to adopt the strategic goal “*Baltic Sea unaffected by eutrophication*” and achieve a good ecological and environmental status of the Baltic Sea the Contracting States agreed<sup>6</sup> to introduce the stricter rules for wastewater treatment.

In order to reduce the current total nutrient input to the Baltic Sea by 15 250 tons of phosphorus and 135 000 tons of Nitrogen Contracting States would

<sup>6</sup> HELCOM Baltic Sea Action Plan was signed up in Krakow on 15 November 2007 by 8 EU states from Baltic Sea catchment: Denmark, Estonia, Finland, Germany, Latvia, Lithuania, **Poland**, Sweden

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have to develop national programs by 2010 and implement the following recommendations:

- HELCOM RECOMMENDATION 28E/5 on more stringent requirements for P-removal from municipal wastewater treatment plants (above 10,000 p.e.) and introduction of requirements for wastewater management for small-and medium-sized municipalities (300-10,000 p.e.);
- HELCOM RECOMMENDATION 28E/6 on improvement of on-site wastewater treatment of single-family homes, small businesses and settlements up to 300 p.e.

**Layout of wastewater requirements**

Tab No 7

Scope p.e.	EU UWWTP Directive	HELCOM recommendations
>100 000	N: 70 – 80 %; or 10 mg/l P: 80% and 1 mg/l BOD <sub>5</sub> : 70 – 90% and 25 mg/l	N: 70 – 80% or 10 mg/l P: <b>90%</b> or <b>0.5</b> mg/l BOD <sub>5</sub> : 80% and <b>15</b> mg/l
10 000 – 100 000	N: 70 – 80% or 15 mg/l P: 80% or 2 mg/l BOD: 70 – 90% and 25 mg/l	N: 70 – 80% or 15 mg/l P: <b>90%</b> or <b>0.5</b> mg/l BOD <sub>5</sub> : 80% and <b>15</b> mg/l
2000 – 10 000	Secondary treatment BOD <sub>5</sub> : 70 – 90% or 25 mg/l COD: 75% or 125 mg/l	<b>N</b> : 30% reduction <b>P</b> : 80% or 1.0 mg/l BOD <sub>5</sub> : 80% and <b>15</b> mg/l
300 - 2000	No requirements	P: 70% or 2 mg/l N: 30% or 35 mg/l BOD: 80% or 25 mg/l
Up to 300	No requirements	28E/6 HELCOM Recommendation Basic reduction: 80% of BOD <sub>5</sub> 70% of P and 29% of N <sub>tot</sub> and emissions per capita

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The Recommendations will be implemented **in stages**:

- by the end of 2010 for agglomerations of more than 200,000 p.e.,
- by the end of 2012 for agglomerations of more than 100,000 p.e.,
- by the end of 2015 for agglomerations of between 10,000 and 100,000 p.e.,
- by the end of 2018 for agglomerations of between 2,000 and 10,000 p.e.,
- by the end of 2018 for agglomerations of between 300 and 2,000 p.e.

For agglomerations above 10,000 p.e. the requirements for phosphorus in the wastewater would be 1.0 mg/l or 90% reduction until 2013.

The implementation of the requirement of 0.5 mg P/l will be decided by the Contracting States according to national programs by 2010.

The nutrient reduction targets for Poland have been set up like this:

- **8,760 tonnes Phosphorus** ~58% of total reduction needed
- **62,400 tonnes Nitrogen** ~46,8% of all for Baltic catchment .

This is a very ambitious task not only for wastewater management but also for pollution prevention measures in agriculture and substitution of polyphosphates in detergents decisions.

Poland is obliged to undertake the most appropriate and cost-effective measures to implement the requirements of the two aforementioned recommendations for wastewater management and introduce them into national programs.

To up-date the wastewater treatment programs (described in page 11) or set up the new priorities and improvements to Polish environmental law or adopt new ideas of sustainable sanitation - **the economic instruments** should be used by decision makers. The results of the HELCOM/NEFCO Project (initiated to support the HELCOM Task Force on eutrophication segment) may be useful for this purpose.

## 7 Conclusions

### Major issues of wastewater management system in Poland

- ✓ Poland is highly populated country of crucial role for eutrophication problem of Baltic Sea in scope of point water-born sources of biodegradable pollution.
- ✓ After 2004, when Poland had become a member of EU community - the adoption of European standards into Polish legislation became a challenge not only for economy development but also for recovery of environmental status, including the poor quality of water-bodies.
- ✓ The implementation of Council Directive 91/271/EEC on local level is assigned to local governments (*gminas*), although Ministry of Environment play the coordination role in the field of water management with its operational body of National Water Management Board.

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- ✓ The requirements of Accession Treaty are a tough task to fulfill in the scope of wastewater management because of the scale of the country, poor status of the infrastructure, financial limits, organization and legal complexity and adoption of new standards of free market to national economy. Poland has reported of fulfilling the first stage of Accession Treaty' requirements in one year' delay.
- ✓ Demographic structure contributes to the poor status of wastewater systems; high proportion of inhabitants living in rural areas (~40%) and extremely high number (39000) of small agglomerations (<2000 p.e.) seeming to be outside of the concern of water managers and decision makers because of priorities settled in the programs.
- ✓ It has been identified the big infrastructure gap between urban and rural areas; wastewater collecting systems have provided services to 84.5% inhabitants of urban areas and only 19% of rural, scattered settlements.
- ✓ Even when the wastewater treatment programs were implemented in time as it is in Accession Treaty schedule, a considerable part of population (~5 mln people) will still remain outside the centralized wastewater systems in Poland. Some cost-effective methods of on-site treatment and solutions of sustainable sanitation for rural areas should be developed.
- ✓ The highly concentrated amount of sludge from urban centralized WWTP rises by around 5 – 10% per year and becomes one of the most severe environmental problems in Poland.
- ✓ The effectiveness of absorption of Structural Funds in the period 2004 - 2006 has been about 70% at the end of 2007. Poland is now ahead of the chance to gain as much as 500 mln Euro only for water management in the period 2007 – 2015 to support the investment process, coordinated on national level. The effective management of this resources will be of the crucial significance for reduction of biodegradable loads being discharged into Baltic Sea.
- ✓ The structure of investment cost shows the majority of resources (> 70%) spent for construction of collecting channels comparing to the modernization costs of WWTP (<30%). This gap rises in smaller agglomerations.
- ✓ The sustainable sanitation option for less populated areas should be taken into consideration within HELCOM/NEFCO project, while making

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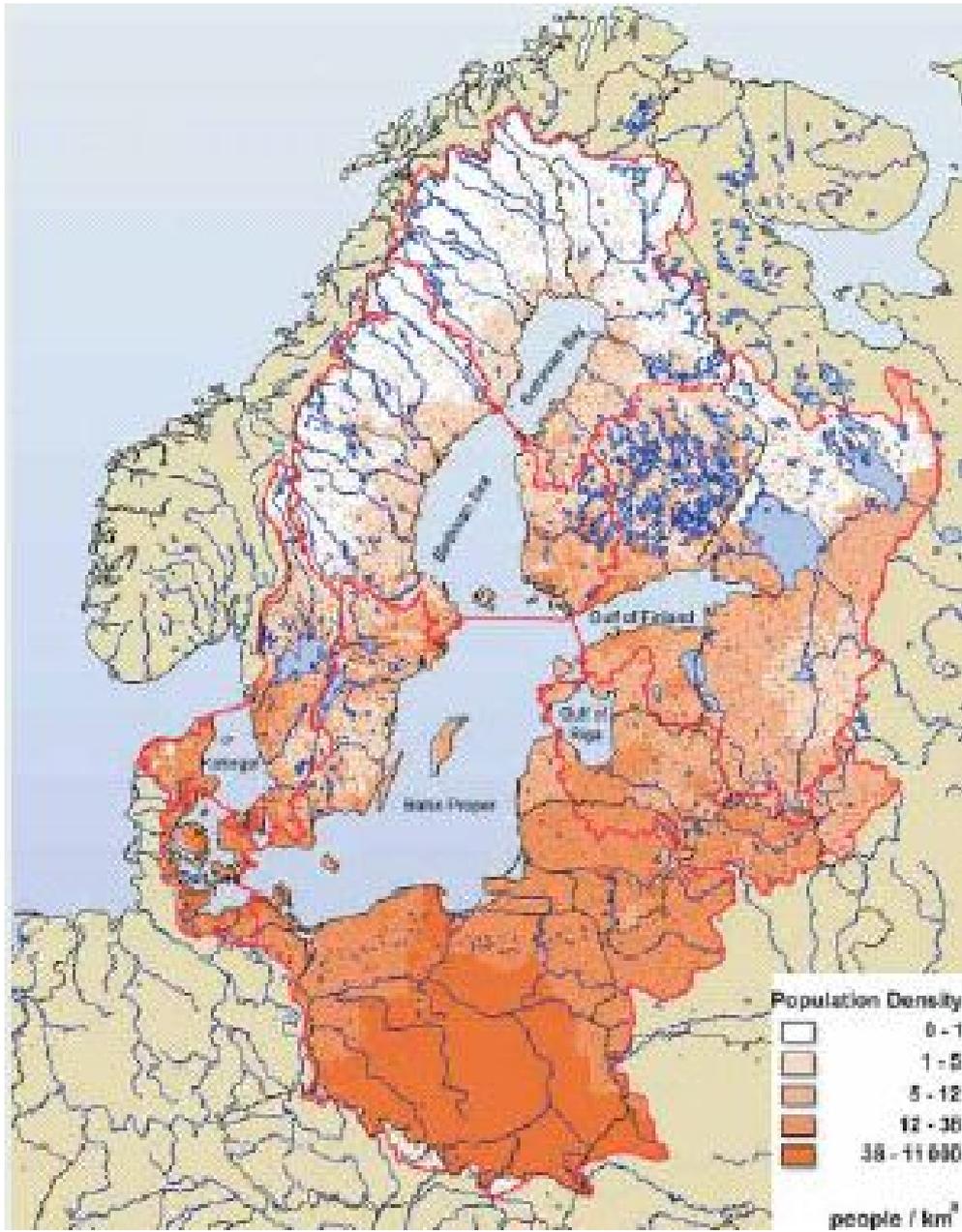
the economic analyzes of the most effective measures to be implemented in Poland and other CEE countries in the scope of eutrophication. The CCB could suggest this initiative via Global Water Partnership CEE to HELCOM Secretariat.

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