

Andrzej GRACZYK  
Wrocław University of Economics (Poland)  
Zbigniew Jakubczyk  
Opole University (Poland)

## **INVESTMENTS IN ENVIRONMENTAL PROJECTS AS AN ELEMENT OF A POLICY FOR SUSTAINABLE DEVELOPMENT IN THE REGION OF OPOLE IN 1993–2004 – FROM A STRUCTURAL POINT OF VIEW**

One of the key elements of sustainable development is maintaining the ecological order, as well as the economic, spatial and social orders. Decreasing the emission of pollutants, both at national and regional level, requires, among other things, increasing investment in environmental protection. The amount of pollution emitted into the environment cannot exceed the ability of the environment to assimilate it. This problem is related to the wider problem of inter-generational fairness. Levels of pollution exceeding the ability of the environment for assimilation will cause a greater than proportional fall in the resistance of the environment. This means that the population of „fathers” leave the environment to their sons in a worse state than they inherited it. Such a system is a contradiction to the concept of sustainable development [see Fiedor et al., 2002, Chapter 8].

This article is devoted to the generating of capital for environmental projects in the region of Opole through investments. The period analysed is from 1993, when there was a significant change in the financing of environmental projects in Poland. This was due to a change in the structure of the major institutions subsidising environmental projects. The regional funds for environmental protection and water management were given legal status as corporate identities. This enabled them to carry out an active

financial policy, reducing the level of dotations in favour of preferential loans. In addition, local government funds for environmental protection were set up, which reduced the transaction costs for environmental projects at the level of local government.<sup>1</sup> This has influenced the level of investments in environmental projects.

In 1993–2004 there were three visible trends in this field within the region of Opole. However, these trends were associated to a large degree with tendencies which were visible in the economy as a whole, not just the field of environmental protection. It is not an isolated, autonomous sector, but is subject to booms and slumps, just as other sectors.

In the first part of this period there was a significant increase in investments in environmental projects, whereas in the second part there was a dynamic fall. In the third part of this period there was a gradual increase in investment from the very low level at the end of the second part. This picture relates specifically to the region of Opole, because at national level the proportion of GDP spent on environmental protection has been at a constant, low level of 0.6% since 2000. It must be said that at the beginning of the 1990s this share was very low and before 1990 was even below 0.5%. In 1996 this share peaked at 1.6% (a share comparable with the share spent on environmental protection in highly developed

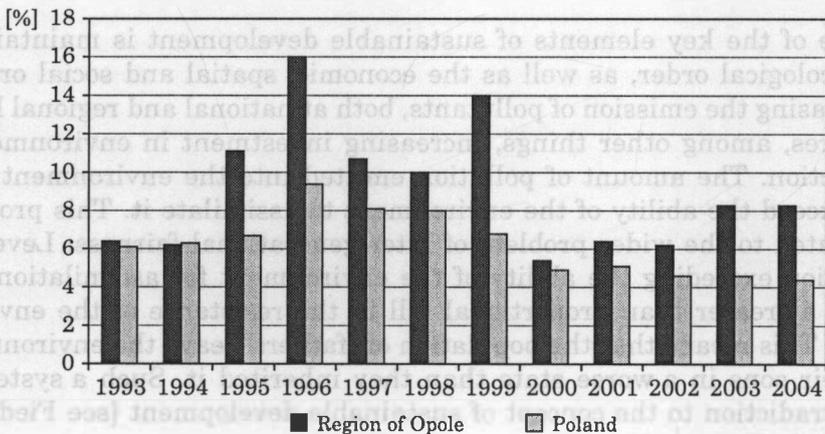


Fig. 1. Investment in environmental projects as a proportion of total investment: 1993–2004

Source: based on data from GUS (the national statistical office).

<sup>1</sup> For a wider discussion of the influence of new institutions on the level of transaction costs in countries undergoing transformation see: Platje, J., *Bodźce i koszty transakcyjne a zmiany instytucjonalne oraz stanu polskiej gospodarki w latach 1970–2000*. Opole: Wydawnictwo Uniwersytetu Opolskiego UO (in print) and Platje [2004].

countries, although in absolute terms the expenditure per capita was much lower).

An important indicator, enabling assessment of levels of investment, is the share of investment in environmental projects as a proportion of total investment. This indicator shows how important the environment is in terms of investment. This share was higher in the Opole region than at national level for the whole of the study period. A particularly large difference can be seen for 1996, which was a particularly good year for investments in environmental projects (in Poland 9.4%, in the region of Opole 16%) and in 1999, which seems somewhat surprising since it was a crisis year (Poland 6.8%, region of Opole 14%). After a slump in the years 2000–2002 the situation improved in 2003. The fact that similar shares were observed in 2004 indicates that this tendency has been maintained.

The share of investments in water management has also been higher at regional level than at national level. However, a clear difference was only observed after the 1997 flood, when it was necessary to repair the resulting damage. Between 1999 and 2001 the share of development in this field was three times higher in the region of Opole than at national level. In 2003 there was no difference in the share of such investments at these levels. In 2004 this indicator was slightly higher at regional level than at national level.

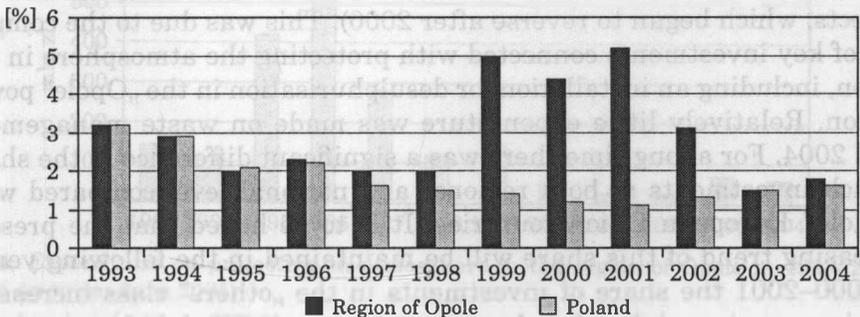


Fig. 2. Investment in water management as a proportion of total investment: 1993–2004  
Source: based on data from GUS (the national statistical office).

Trends in the changes of the structure of expenditure on environmental protection are of particular interest. At the beginning of the study period the majority of expenditure was on protecting the atmosphere (57.5%). Up to 1996 this proportion actually increased. In the following years, however, there was a relative increase in spending on water management, in excess of the national share (approx. 50% – towards the end of

**Table 1.** Structure of the investments in environmental protection in the region of Opole: 1993–2004 (percentages)

Year	Water management	Protection of the atmosphere	Waste management	Other
1993	25.75	57.54	17.13	0.05
1994	29.09	53.28	15.75	1.88
1995	12.74	80.43	6.65	0.18
1996	12.09	83.84	4.01	0.06
1997	25.11	62.83	11.25	0.81
1998	45.26	35.02	18.07	1.66
1999	54.56	34.83	9.50	1.11
2000	66.29	23.85	8.33	1.54
2001	70.11	18.46	4.49	6.95
2002	66.69	21.25	7.65	4.40
2003	51.13	40.99	5.44	2.44
2004	53.09	34.74	12.17	0.00

Source: based on data from GUS (the national statistical office).

the 1990s there was a fall in the national share of investment in such projects, which began to reverse after 2000). This was due to the completion of key investments connected with protecting the atmosphere in the region, including an installation for desulphurisation in the „Opole” power station. Relatively little expenditure was made on waste management until 2004. For a long time there was a significant difference in the share of such investments at both regional and national level compared with the „old” European Union countries. It is to be hoped that the present increasing trend of this share will be maintained in the following years. In 2000–2001 the share of investments in the „others” class increased. This increase is mainly related to investments connected with energy conservation. These investments were stimulated above all by an increase in the costs of various sources of energy. However, the following years saw a decreasing trend, leading to the share of such investments becoming negligible in 2004.

An analysis of the dynamics of the absolute changes in the expenditure on investments in these categories leads to interesting conclusions. The level of investment in water management was relatively stable between 1993 and 1995. An acceleration of investment occurred in 1996 and lasted until 1999, despite the clear national recession at that time. This was

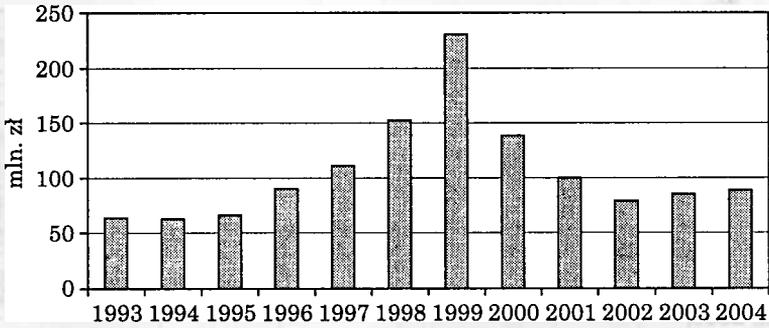


Fig. 3. Expenditure on water management in the region of Opole in (based on prices from 2001)

Source: based on data from GUS (the national statistical office).

connected with the length of the investment cycle of both municipal and industrial sewage systems. In 2003–2004 the negative tendency of the previous few years was reversed. The possibility of local governments obtaining grants from pre-accession funds was a factor stimulating investments in this area.

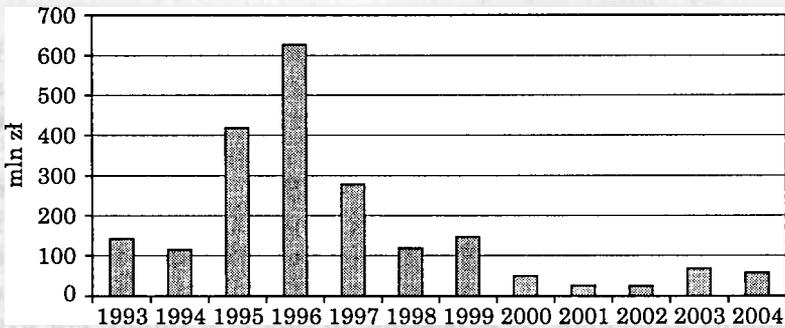


Fig. 4. Expenditure on protecting the atmosphere in the region of Opole in 1993–2004 (based on prices from 2001)

Source: based on data from GUS (the national statistical office).

Investments in protecting the atmosphere show a completely different pattern. There was a significant increase in investment in 1995–1997. However, in the following years there was a dramatic slump in the level of investment. In real terms in 2002 the level of investment was almost 24 times lower than in the record year of 1996 (26.3 mln compared with 626.4 mln zł). As in the field of water management 2003 brought about a minor reversal of the negative trend. However, the data from 2004 indicate that this may not be a lasting trend.

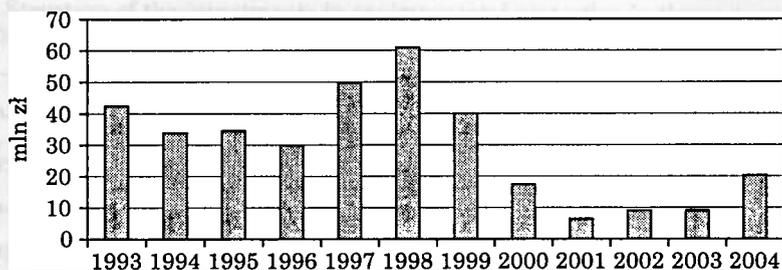


Fig. 5. Expenditure on waste management in the region of Opole in 1993–2004 (based on prices from 2001)

Source: based on data from GUS (the national statistical office).

In the first four years of the study period there was a continuous fall in the level of investment in waste management. An increase followed which peaked in 1998, which is undoubtedly associated with the implementation of the Act on Waste Management and Maintaining Order and Cleanliness by local governments. In the disastrous year of 2001 from the point of view of investment, the real level of investment was almost 10 times lower than the peak level in 1998 (6.4 mln compared to 60.9 mln zł). As in the previous cases, there was a reverse of this negative trend in 2002–2003, together with a clear increase in 2004.

With respect to both absolute spending and the relative share in total investment, after a clear negative trend in investment in water management there followed a significant increase in investment after the 1997 flood. In real terms, however, the level of investment remained below the levels observed in the first half of the 1990s – the peak occurring in 1994. Since 2001, due the completion of important investments and the increasing budget crisis, there has been a fall in the level of investment. There has been a lack of new investment, despite the fact that a lot of work remains to be done. It is possible to talk of a slump. For example, the Nysa Kłodzka river requires urgent regulation along the section from Lewin Brzeski to its outlet. The future realisation of major projects in this field supported by the Cohesion Fund may well improve this situation.<sup>2</sup> The slight increase in expenditure in 2004 is insufficient.

Total investment on environmental protection and water management is presented in Table 2.

The trends in investment presented above were strongly correlated with the general economic trends occurring in Poland. In 1998–2000

<sup>2</sup> Protection against flooding lies within the priorities of the Cohesion Fund. This protection will be achieved, above all, by the construction of multifunctional reservoirs which will simultaneously protect against flooding and improve water supply. See Strategia... [2004].

**Table 2.** Total investment on environmental protection and water management 1993–2004 (according to 2001 prices)

Year	1993	1994	1995	1996	1997	1998
Environmental protection (mln zł)	247.7	215.3	520.2	747.2	442.6	337.2
Water management (mln zł)	210.9	219.8	91.6	109.6	63.8	69.0
Year	1999	2000	2001	2002	2003	2004
Environmental protection (mln zł)	199.8	156.2	115.4	58.9	31.1	38.6
Water management (mln zł)						

Source: based on data from GUS (the national statistical office).

investments in environmental protection fell by 35%, in 2001 alone investment fell by 20%. The national slump in this sector was greater than the overall slump in economic performance. In addition, the exploitation costs of technology for environmental protection and the employment of environmental protection workers together were greater than the level of investment, in the 1990s by 5–7%, but since 2000 by almost 50%.

The structure of investment groups is also interesting. During the period analysed, there were significant changes in this structure.

**Table 3.** The structure of investment in environmental protection in the region of Opole according to investors in 1993–2004

Year	% share of investment by firms	% share of investment by local government	% share of investment by central government
1993	77.9	20.58	0.26
1994	74.55	24.4	0.96
1995	88.76	10.91	0.28
1996	87.68	11.64	0.67
1997	75.64	23.65	0.83
1998	56.83	40.71	2.38
1999	62.08	36.93	0.981
2000	40.7	57.46	1.83
2001	42.94	56.42	0.63
2002	46.47	52.2	1.63
2003	54.54	45.12	0.28
2004	55.10	44.76	0.001

Source: based on data from GUS (the national statistical office).

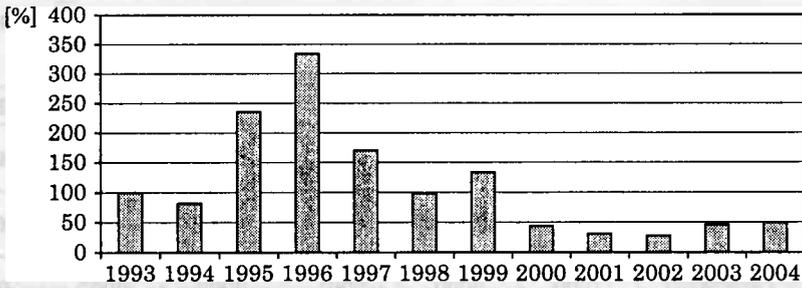


Fig. 6. Index of real investment by firms in environmental protection in the region of Opole (index in 1993 – 100%)

Source: based on data from GUS (the national statistical office).

In 1993 a significant majority of investment came from firms. However, since 1997 there has been a clear trend for the share of investment coming from local government to increase. This is related to two factors. The responsibilities of local government in the field of environmental protection have increased. Simultaneously, during a period of increasing recession local governments have had relatively good cash flow. By 2000 local government had the majority share of investments in environmental protection. In 2003 and 2004 there was a reversal of this trend, the share of firms being about 10% greater than that of local government. Central government played an insignificant role throughout this period. The share of investment by central government peaked at 2.38% in 1998.

An analysis of the dynamics of real investment gives us additional information. In the 1990s the fall in real investment by local government was less significant than in the case of firms. This confirms the hypothesis given above regarding the absorbing effect of the activities of pre-accession funds. The main beneficiaries of EU support are local government units and the organisational units responsible to them. Financial aid to firms, especially large firms is thought to be against the rules of fair competition. Only when the Integrated Operational Programmes of Regional Development and of Increasing the Competitiveness of Enterprises came into action did it become possible to give aid to firms on a greater scale [see Podręcznik ..., 2004]. However, this effect is only related to small and medium-sized firms. The increase in investment by firms results from the process of firms adapting to EU standards.<sup>3</sup>

Another important issue is the difference between “end of the pipeline” investments and integrated investments. The first type of investment

<sup>3</sup> For a more detailed cost analysis see Fiedor [2000].

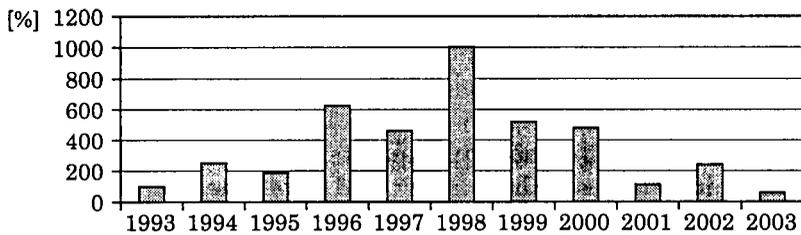


Fig. 7. Index of real investment by local government in environmental protection in the Region of Opole (index in 1993 – 100%)

Source: based on data from GUS (the national statistical office).

does not affect the production process – it is based on reducing or neutralising the pollution emitted by such processes. Integrated investments lead to reducing emissions of pollution at source with the aid of improved technological processes, which lead to production becoming cleaner and more environmentally friendly. In the case a new technological process is set up, the methodology of calculating the cost of such investments assumes that the costs of investing in environmental protection are the added costs from investing in a higher level of technology rather than cheaper but less environmentally friendly technology. In the case of modernising an already existing process, the costs of investment in environmental protection is taken to be the expenditure required to adapt to the required norms. Unfortunately, such a classification has only been used since 1997. Hence, no such data is available for the first years of our study period.

Table 4. Real investment in environmental protection in the region of Opole according to type of investment in 1997–2004 (in mln zł, according to 2001 prices)

Year	End of pipeline		Integrated		Research	
	Region of Opole	Poland	Region of Opole	Poland	Region of Opole	Poland
1997	90.14	71.30	9.85	27.66	0.00	0.07
1998	89.10	66.93	10.81	32.80	0.00	0.04
1999	71.18	75.80	28.77	23.95	0.00	0.11
2000	87.60	80.49	12.22	19.29	0.14	0.15
2001	80.53	75.80	19.46	23.90	0.00	0.03
2002	79.57	78.73	20.1	20.96	0.07	0.05
2003	67.44	75.72	32.46	23.8	0.00	0.10
2004	68.0	79.9	31.9	19.7	0.00	0.00

Source: based on data from GUS (the national statistical office).

It is generally accepted that integrated investments are a better form of preventing pollution than "end of the pipeline" investments. This is due to the fact that integrated investments put into practice the philosophy that "it is better to prevent than to cure". There is also an economic aspect to this. "End of the pipeline" investments are normally characterised by higher exploitation costs than integrated investments. There also exists the question of what to do with the waste formed in the cleansing process, e.g. sewage from sewage works and clay deposits from the desulphuring process of emissions from power stations. However, it should be added that it is not possible to carry out integrated investment in some enterprises without huge costs of modifying whole technological processes.

Since 2000 there has been a fall in both "end of pipeline" and integrated investments. However, the fact that the fall in integrated investments was far slower than the fall in "end of pipeline" investments is a positive sign. "End of pipeline" investments fell by a factor of three and a half, while integrated investments only fell by a factor of one and a half. In 2003 there was an increase in real investment in integrated investments, while investment in "end of pipeline" investments continued to fall.

However, comparison with the structure of national investment (Tab. 4) gives much less cause for optimism. Until 2002, apart from in 1999, in the region of Opole the share of integrated investment in total investment in environmental protection was lower than the share at national level. Nevertheless, the difference between these shares has significantly fallen since 1997 and in 2003–2004 was actually higher in the region of Opole. Investment in research, which is basically funded by the State fund for Environmental Protection and Water Management, has been insignificant in the region of Opole apart from in 2000.

The source of funding also gives us important information. From Table 5 the differing trends in the level of investment from each group can be seen. In 1997–2001 foreign investment fell most rapidly. The real value of such investments fell by a factor of 36.5 over this period. The reason for this fall was that old investments were being completed and new investment, which was connected with Poland's accession to the EU, had not yet started. The pre-accession funds, PHARE, SAPARD and ISPA, were a major factor in the noticeable increase in foreign investment in 2003. Since these programmes require financial input from the side of the beneficiary, there has been an increase in domestic investment.

A dramatic fall was noted in 1997–2001 in the financing of investments using domestic credit (by a factor of over 15). In this case one may talk about the „squeezing out" effect of preferential credit for environmental investments on the financial markets. This results from preferential credit for ecological investments squeezing out the demand for normal,

**Table 5.** The structure of investments in environmental protection in the region of Opole and Poland according to source of funding 1997–2004 (percentages of total investment)

Year	From a firm's own funds		Ecological funds		Central government		Local government		Domestic credit		Foregin credit		Other means	
	RO	RP	RO	RP	RO	RP	RO	RP	RO	RP	RO	RP	RO	RP
1997	42.24	47.03	11.11	16.9	0.75	5.80	0.59	1.79	13.7	16.53	14.07	3.80	17.55	8.13
1998	45.13	50.22	22.58	16.20	4.18	4.68	2.70	1.74	15.19	12.53	5.16	7.25	5.04	7.38
1999	40.02	46.16	22.82	24.57	1.59	3.39	8.74	1.79	13.44	12.94	6.92	5.95	6.47	5.20
2000	45.39	53.31	35.00	20.05	0.24	3.65	0.34	3.72	11.74	11.60	2.72	3.91	4.58	5.56
2001	55.72	51.82	29.61	23.67	2.74	3.06	0.21	1.05	2.81	12.16	1.19	3.17	7.72	5.07
2002	53.66	46.71	32.98	26.12	2.69	1.75	1.63	3.01	5.29	12.28	0.00	4.15	3.75	0.00
2003	57.37	44.08	24.43	25.3	0.28	1.46	3.57	1.7	6.12	13.88	4.02	8.86	4.20	4.71
2004	29.39	39.11	9.45	15.3	32.73	12.73	0.00	0.65	19.25	5.69	6.26	20.08	2.92	6.43

RO – Region of Opole; RP – Republic of Poland

Source: based on data from GUS (the national statistical office).

commercial credit [compare Fiedor, 1997, 4–6]. This effect is often used as an argument against the functioning of ecological, non-budgetary funds in Poland for the following reasons:

- a) it breaks down the coherence of the system of public finances;
- b) it creates barriers to the optimal (market) allocation of financial and material resources potentially available to environmental protection;
- c) it breaks the fundamental rule of the market in the field of environmental protection *i.e.* the polluter should pay;
- d) it breaks the general rule of the market that enterprises should bear the full costs of their activities, including external environmental costs related to counteracting environmental degradation or returning the state of the environment to the socially required level.

The following argument is also used: the financing of environmental projects on a preferential basis compared to normal commercial credit given to players who pollute leads to a different choice of borrowers or goals to the choice of borrowers and goals resulting from market principles.

However, this effect should not be assessed in purely negative terms. Firstly, the market is not able to define the socially acceptable level of exploiting natural resources. Hence, it is unable to define the appropriate level of protective action. In particular, the market is unable to value such a specific resource as the ecological capacity of the environment. If the range of protective action is increased to the socially required level thanks to the activities of ecological funds, then the price of the „squeezing out” effect, *i.e.* the limiting of the scale of activity of commercial enterprises in financing environmental protection, is undoubtedly worth paying for.

Secondly, preferential credit leads to squeezing out only according to the difference between the market and the preferential rate of interest on credit for ecological projects. In the situation where the commercial interest rate is seen to be too high and at the same time various types of hidden payments are added on, the existence of a competitive system of financing forms a barrier against excessive interest rates, at least in the field of environmental protection. This is particularly important in the situation where banks limit the risk associated with granting loans, in order to gain a certain income from the possession of stocks and government bonds.

Thirdly, the principle accepted by ecological funds of only covering the costs of an investment resulting in environmental protection, while firms must cover the remaining costs of the investment, means that extra funds are generated for environmental protection, *i.e.* this is a type of multiplier effect. Hence, regardless of whether the „squeezing out” effect exists or not, the end effect must be positively assessed from an ecological point of view.

The principle of the polluter pays is not drastically broken by such preferential credit. Ecological funds and preferential credit given by the Environmental Protection Bank are, to a large degree, funded by fees and fines paid by firms. These funds are thus simply placed in a central pool which, within the framework of the criteria of the appropriate institutions for choosing enterprises that are to receive credit, are then recycled among firms and local governments who carry out ecological investments. Thus, the principle of the polluter pays has been changed into the principle of the polluters pay. Hence, investments are no longer funded by public finance, fees and fines are simply centralised and then redistributed.

The following are other factors which mean that preferential credit for ecological projects may well be beneficial from the point of view of realising a state environmental policy:

a) the creation of a legal guarantee for expenditure on environmental protection in the form of fees and fines. This is particularly important under the present conditions of increasing problems regarding the state budget, when there is a great temptation to reduce expenditure on environmental protection in favour of solving „more immediate” budgetary needs;

b) ensuring funding is available for environmental projects;

c) making the level of expenditure on environmental projects less dependent on the present state of budget finances, the economic situation etc.

Since 2002 the „squeezing out” effect has significantly weakened and in 2003 the level of funding investments using domestic credit rose by a factor of 2.5. However, this increase was completely reversed in 2004 in both the region of Opole and Poland as a whole. A strong „squeezing out” effect returned in Poland, whereas domestic credit remained a significant source of funding ecological projects in the region of Opole.

The real value of investment coming from ecological funds has remained at a fairly constant level over the study period. This level was noticeably higher in the years 1998–2000. However, the real value of such investment in the following years of recession remained at a similar level to that in 1997. This confirms the argument regarding the benefit gained from such funds, since they maintain the funding of environmental projects during recessions.

However, during this recession the level of investment from the funds of enterprises fell by a factor of over 3. This was undoubtedly related to the economic situation. Many firms had cash flow problems and there was a lack of funds available for realising environmental projects. As in the case of funds from domestic credit, a positive, though weaker, trend appeared in 2003. However, the trend was completely reversed in the region of Opole in the following year.

The level of funding from central government was insignificant for the majority of the study period. This changed dramatically in 2004, since national funds were required in the funding of EU supported projects. The level of funding by local government became insignificant in the same year.

The spatial structure of investment is also interesting. Investment in the construction of municipal sewage systems had finished in nearly all the municipalities in the region by the end of the century. Such systems were realised in the catchment areas of both the Oder and the Nysa Kłodzka rivers. A similar phenomenon may be observed in the case of industrial sewage systems. Within the region of Opole the spatial structure of investment in protection of the atmosphere matches the spatial structure of industry. The largest enterprises carried out the largest investments. The highest level of investment was observed in the study period in the municipalities of Kędzierzyn-Koźle and Opole.

Two strategies may be observed with regard to the management of municipal waste sites. The first is to build a single, central waste dump, which may be supplemented by a second, smaller one. This strategy was followed in the municipalities of Brzeg, Kędzierzyn-Koźle, Kluczbork and Namysłów. The second strategy is based on building a network of small dumps. This strategy was employed in the municipalities of Nysa and Opole.

Summarising, the significant level of engagement in investing in environmental projects from a large group of players should be underlined. The level of investment in such projects was higher in the region of Opole than in the rest of Poland during the majority of the study period. The slump in the level of investment is associated with the present problems regarding the state budget, which inevitably negatively affected the regional level of investment.

Given this, one may state that with respect to generating capital for environmental protection, the region of Opole has outperformed the rest of Poland over a long period. In this way, the region has created the fundamentals for developing a policy for sustainable development at the regional level.

## Literature

- Cudak-Kiersz, J., „NFOŚiGW w 2004 roku. Przychody i wydatki”, *Ekofinanse*, 2, 2004.  
Czaja, S., Fiedor, B., Graczyk A., Jakubczyk Z., *Oplaty produktowe i depozyty ekologiczne*. Opole: Instytut Śląski, 1996.  
Fiedor, B. (ed.), *Analiza zakresu i procedur kredytowania oraz rozpoznanie przyszłej strategii w zakresie kredytowania. Identyfikacja, pomiar i kryteria porównywania skutków*

- zaburzeń powodowanych w systemie gospodarczym przez kredytowanie preferencyjne (ekologiczne)*, final report. Wrocław: NFOŚiGW, 1997.
- Fiedor (ed.), *Dostosowanie polskiego prawa i regulacji ekologicznych do rozwiązań Unii Europejskiej. Koszty i strategia*. Warszawa–Białystok: Fundacja Ekonomistów środowiska i zasobów Naturalnych, 2000.
- Fiedor, B. (ed.), Czaja, S., Graczyk, A., Jakubczyk, Z., *Podstawy ekonomii środowiska i zasobów naturalnych*. Warszawa: Wydawnictwo C.H. Beck, 2002.
- Fiedor, B., Jakubczyk, Z., Szafranek, E., „Finansowe aspekty inwestycji ekologicznych na Opolszczyźnie”, in: Słodczyk, J. (ed.), *Rozwój miast i zarządzanie gospodarką miejską*. Opole: Wydawnictwo Uniwersytetu Opolskiego, 2004.
- Finansowanie ochrony środowiska (debata redakcyjna) [edited debate], *Przegląd Komunalny*, 3, 2002.
- Górka, K., *Problemy funkcjonowania funduszy ekologicznych w Polsce*. Warszawa: Biuro Informacji i Dokumentacji kancelarii Senatu, 2002.
- Platje, J., *Institutional Change and Poland's Economic Performance since the 1970s – incentives and transaction costs*. Wrocław: CL Consulting and Logistyka, 2004.
- Strategia wykorzystania Funduszu Spójności. Warszawa: MGPIPS, 2004.
- Podręcznik beneficjenta Sektorowego Programu Operacyjnego – *Wzrost Konkurencyjności Przedsiębiorstw lata 2004–2006*. Warszawa: NFOŚiGW, 2004.
- Raport z działalności Wojewódzkiego Funduszu Ochrony Środowiska i Gospodarki Wodnej w Opolu w 2004 roku. Opole: WFOŚiGW, 2005.
- Stanowisko Sejmiku Województwa Zachodniopomorskiego w sprawie systemu finansowania ochrony środowiska w regionie, *Ekofinanse*, 3, 2004.
- Walczak K., “WFOŚiGW w Sejmie. Nie burzyć systemu”, *Ekofinanse*, 6, 2004.
- Zlikwidować fundusze?, *Ekofinanse*, 7–8, 2002.