

# Environmental Financing in the Republic of Croatia - What are the Options?

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*Sustained provision of sufficient financial resources for environmental investments is a prerequisite for addressing environmental challenges in the Republic of Croatia. It is of high importance to set out optimal use of the various available sources of environmental finance, including domestic public expenditure, international assistance, loans from international financing institutions and financial contributions by the private sector. Governments need to prioritize the environment in public expenditure framework and create suitable climate for the private sector participation in environmental financing. The international community must ensure more accessible loans from international financing institutions for environmental investments and provide grant co-financing possibility. Private sector involvement requires the establishment of mechanisms that will facilitate private sector contributions to public sector infrastructure projects.*

**Key words:** Environmental policy, Environmental financing, Environmental protection expenditure, European Union, Croatia

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## 1. Introduction

Financing environmental improvements in the Republic of Croatia is becoming increasingly important. Citizens are more aware of the negative effects of environmental pollution on health and the economy concerning all environmental domains. Despite the significant progress already achieved in the environment sector, mobilizing an adequate level of resources in order to attain environmental goals remains a high priority.

Trends and developments in environmental financing ensure improving effectiveness of environmental financing from both domestic and external financing sources. In order to optimize environmental investments it is essential to increase levels of investment, to co-ordinate sources of financing, to involve the private sector and move closer towards full cost recovery and compliance with the polluter pays principle. In such a case, the prospect of the

EU accession serves as a motivation factor for improving environmental conditions.

Environmental financing data used in this report have been collected from national official statistics, international databases and international financing institutions.

## 2. Environmental Policy in the Republic of Croatia - Relation with the EU

The European Union (EU) accession process requires substantial investments into the environment. The EU environmental policy focuses on sustainable development and aims to protect the environment for present and future generations. The Environmental *Acquis* comprises over 200 major legal acts that should be approximated in the Republic of Croatia<sup>1</sup>. The investment challenge is associated with implementation of the so-called key investment-heavy directives<sup>2</sup>.

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## Horizontal legislation

- \* Council Directive 2003/4/EC on **public access to environmental information**
- \* Council Directive 2003/35/EC on **public participation**
- \* Council Directive 2004/35/EC on **environmental liability**
- \* Council Directive 85/337/EEC on **Environmental Impact Assessment (EIA)**
- \* Council Directive 2001/42/EC on **Strategic Environmental Assessment (SEA)**
- \* Council Directive 91/692/EEC on **reporting**
- \* Council Directive 2003/87/EC on **emissions trading**

## Air quality

- \* Council Directive 96/62/EC on **Ambient Air Quality Framework**
- \* Council Directive 2001/81/EC on **national emissions ceilings**
- \* Council Directives 98/70/EEC and 99/32/EC on **quality of petrol and diesel fuels** and on the **sulphur content of certain liquid fuels**
- \* Council Directive 99/94/EC on **CO<sub>2</sub> emissions** from new passenger cars
- \* Council Directive 94/63/EC on **volatile organic compound (VOC) emissions** from storage of petrol and its distribution from terminals to service stations
- \* Council Directive 2004/42/EC on limitations of emissions of volatile organic compounds (**VOCs**) **due to the use of organic solvents in certain paints and varnishes and vehicle refinishing products**

## Waste management

- \* **Waste Framework Directive 75/442/EEC**
- \* Council Directive 2006/21/EC on management of **mining waste**.
- \* Council Directive 91/689/EEC on **hazardous waste**
- \* Council Directive 75/439/EEC on **waste oils**
- \* Council Directive 96/59/EC on disposal of **PCB/PCT**
- \* Council Directive 1999/31/EC on the **landfill** of waste
- \* Council Directive 86/278/EEC concerning the use of **sewage sludge** in agriculture
- \* Council Directive 2002/96/EC on **waste electrical and electronic equipment (WEEE)**
- \* Council Directive 2002/95/EC on **restrictions of hazardous substances** in electrical and electronic equipment
- \* Council Directive 91/157/EEC on **batteries and accumulators**
- \* Council Directive 78/176/EEC management of waste from **titanium dioxide**

- \* Council Directive 94/62/EC on **packaging and packaging waste**
- \* Council Directive 2000/53/EC on **end-of-life vehicles**

## Water quality

- \* Directive of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy 2000/60/EC **Water Framework Directive**
- \* Council Directive 79/923/EEC on **shellfish waters**
- \* Council Directive 78/659/EEC on **fish water**
- \* Council Directive 80/68/EEC on **groundwater**
- \* Council Directive 76/464/EEC on **dangerous substances**
- \* Council Directive 91/676/EEC on the protection of waters against pollution caused by **nitrates** from agricultural sources
- \* Council Directive 91/271/EEC on **urban wastewater treatment**
- \* Council Directive 98/83/EC on Quality of Water Intended for Human Consumption - **drinking water directive**
- \* Council Directive 76/160/EEC on management of **bathing water quality**

## Nature protection

- \* Council Directive 79/409/EEC on the conservation of **Wild**
- \* Council Directive (92/43/EEC) on provision of **Habitats**
- \* Council Directive 99/22/EC on keeping of **wild animals in zoos**
- \* Council Directive 83/129/EEC concerning importation of skins of certain **seal pups** and products

## Industrial pollution and risk management

- \* Council Directive 96/61/EC on **Integrated Pollution Prevention and Control (IPPC)**
- \* Directive of the European Parliament and of the Council 2001/80/EC on the Limitation of Emissions of Certain Pollutants into the Air from **Large Combustion Plants (LCP)**
- \* Directive 87/217/EEC on the prevention and reduction of the environmental pollution by **asbestos**
- \* Directive of the European Parliament and of the Council 2000/76/EC on the **incineration of waste**
- \* Council Directive 1999/13/EC on the Limitation of Emissions of Volatile Organic Compounds due to the Use of Organic **Solvents** in Certain Activities and Installations

## Chemicals

- \* Council Directive 67/548/EEC on **Dangerous substances**



\* Council Directive 86/609/EEC as amended by Directive 2003/65/EC on **Animal Experiments**

\* Council Directive 98/8/EC on **biocides** Genetically Modified Organisms (GMOs)

\* Council Directive 90/219/EEC on **contained use of genetically modified micro-organisms (GMOs)**

\* Council Directive 2001/18/EC on **deliberate release into the environment of GMOs**

#### Noise

\* Council Directive 2002/49/EC relating to the **assessment and management of environmental noise**

The basic legislative framework to pursue alignment with the EU environmental acquis has been developed. National Environmental Action Plan (NEAP, 2002) outlines the integration of environmental concerns into other sectors and sets the goal of estimating the cost of harmonizing Croatian legislation with the *acquis*. The total cost of implementing the actions included on the list is estimated at about EUR 6,000 million for the ten-year program. However, the actions to be implemented are not detailed enough and are not in accordance with the EU directives therefore a directive specific cost assessment is needed in order to compare supply and demand side of finance for the EU requirements implementation. Further work is needed to assess the funding gap between the funding needed to comply with the EU environmental *acquis* and available national funds for environment.

Nevertheless, work is ongoing to assess future environmental investment needs for the next 25-year period under the PHARE project „Developing the Capacity of Environmental Authorities through the Transfer of Best Practices on Use of Financial

Resources.” Within the project, the Environmental Financing Strategy for the Republic of Croatia will be delivered. The strategy will cover environmental investment, expenditure and revenues in the air, water and waste sectors and is planned to be finalized by the end of 2007.

### 3. Environmental Protection Expenditure

The transposition of the EU environmental *acquis* at the national level has created a need for increased financing in the environmental sector. The environmental sector faces strong competition for public financial support, as countries have several priority issues to solve in other sectors as well. Government spending is limited by the amount of debt and spending constraints.

Considering trends in environmental expenditures, certain increase in public domestic spending on environmental protection can be observed (Table 1). The level of public spending on environment during the examined period was below the level (approximately 0.65 percent of GDP) needed to comply with the EU environmental *acquis* (2-3 percent of GDP). Table below shows data on total national investment for environmental protection in the Republic of Croatia in the 2004-2006 period in six basic areas: air protection, waste management, waste-water management, protection of soil, surface and underground waters, noise and vibration reduction, protection of biodiversity, protection from radiation and other activities related to environmental protection from pollution. By looking at the share of environmental spending by areas, it seems that the majority of amounts have been allocated to water sector (55% of the total environmental investments for 2006).

Table 1 Total national investment in environmental protection in the period 2004-2006 (million HRK)

	2004	2005	2006
Air and climate protection	110	140	240
Wastewater management	625	728	960
Waste management	265	200	206
Protection of soil, surface and underground waters	213	290	323
Noise and vibration reduction	49	51	18
Protection of biodiversity	18	21	11
Protection from radiation	0.07	0.44	0.6
Other activities related to environmental protection from pollution	27	35	17
<b>Environmental protection – total</b>	<b>1308</b>	<b>1460</b>	<b>1760</b>

Source: Report of the Central Bureau of Statistics, Environmental Protection Investments 2004, 2005, 2006.



## 4. Available Financial Mechanisms

The EU accession process provides increased focus on environmental goals and compliance with the environmental acquis. Therefore, it is important to analyze how assessed expenditure needs may be financed. Their financing strongly depends on the public sector (national and local governments), bilateral donors, European funds and (International Financial Institutions (IFIs).

### Grant assistance

Grants remained the dominant financial mechanism used both by the domestic public sector and international donors. Moreover, a combination of domestic and foreign sources has been and will be used in the future in the Republic of Croatia to meet EU compliance schedules.

### Domestic public sector – State, regional and local self-government budgets

The State budget collects the significant part of revenues from public charges and taxes, which are related to products that pollute the environment or to usage of the environment. Funds provided by the state budget have been used to finance management of waters, hazardous waste, construction of recycling facilities and disposal facilities for hazardous waste. Regional and local self-government units regulate, organize, finance and promote environmental activities of regional or local importance. Usually municipalities receive some so called „ecological” revenues. They are collected in a municipality’s budget through 11 direct charges and six charges flowing into the state and county budgets. „Ecological” revenues in town and municipality budgets increased from 1.5 billion HRK in 2000 to 2.8 billion HRK in 2005, and ecological revenues as joint revenue of county, town and municipal budgets increased from 3.3 billion HRK to over 8 billion HRK. The highest proportions in municipal budgets are usually brought by communal fees (2/3 of revenues), communal tax and other charges determined by a special act (1/4 of revenues). Out of the collected revenue, as shown in the Table below, roughly HRK

800 million were used for environmental purposes in 2006. For water and wastewater needs specifically this number amounted to approx. 500 thou HRK<sup>3</sup>.

The state budget, and Croatian Waters and Environmental Protection and Energy Efficiency Fund (EPEEF) are prime domestic public sources of environmental financing in the Republic of Croatia. Provision of environmental assistance is influenced by the capacity available to prepare and execute projects. The above mentioned institutions are more capable of absorbing funding than other sectors competing for support. Therefore, they have been the main domestic sources of funding of environmental investments during recent years in Croatia.

### International sources

The most significant international sources of grant support include assistance from the EU, assistance from bilateral donors and cooperation initiatives of the donor community. The EC assistance played the most important role providing development of environmental policies, institutions, legislation and infrastructure.

Financial assistance from the EU was provided mainly through Community Assistance for Reconstruction, Development and Stabilisation (CARDS) programme which supported both national projects and regional initiatives. In the environment sector, the Republic of Croatia has received support from the CARDS program amounted to EUR 262 million allocated to 119 individual projects. It supports 7 *environment projects* (total value of EUR 7.6 million) dealing with EU environmental law approximation (□ 3.3m), environmental assessment (□ 1.5m), waste management (□ 1.0m), and small-scale local infrastructure (□ 1.8m)<sup>4</sup>.

Beside CARDS program, the EC also provides support to other infrastructure projects in environment. Thereby, Instrument for Structural Policies for Pre-accession (ISPA) was opened for the Republic of Croatia in January 2005. The Croatian national ISPA environmental strategy includes priority projects for ISPA co-financing in the waste, water and air sectors. Examples of projects receiving ISPA co-financing include the Bikarac Regional Waste Management Centre, Phase 1; and the Karlovac

Table 2 Standard conditions of loan financing

CONDITIONS	TYPICAL IFI
Maturity in years	12
Grace period in years	7
Interest rate and currency	3% p.a. in EUR
Guarantee required?	YES

Sources: PHARE project *Developing the Capacity of Environmental Authorities through the Transfer of Best Practices on Use of Financial Resources - Environmental Financing Strategy of the Republic of Croatia*



Water and Wastewater Program. In 2005-2007, the EU assistance to the Republic of Croatia amounted to EUR 31 million, thereof EUR 12.3 million have been received from ISPA program<sup>5</sup>.

The Instrument for Pre-accession Assistance (IPA) will replace CARDS, PHARE, ISPA, SAPARD and some other programs. The allocation of the EC financial support between components depends largely on national decisions and therefore on the political will to improve the environmental situation. The new EC assistance mechanism, IPA creates a significant opportunity for co-financing environmental-improvement projects.

Environmental infrastructure projects in the Republic of Croatia will receive support under the IPA III component of regional development. Assistance will be focused on two priorities: development of waste management infrastructure for establishing an integrated waste management system in the Republic of Croatia, and protection of Croatia's water resources through improved water supply and wastewater integrated management system. In the package of 2007 IPA program 8.5 million are for the Republic of Croatia<sup>6</sup>.

### Loans

Loans are becoming an increasingly important source of environmental financing. International financing institutions (IFIs) are the main source of the so-called *soft loans* (loans at lower-than-commercial interest rates). IFIs offer a wide range of financial products such as loans, guarantees, equity finance, and may finance capital investment costs as well as project preparation costs such as feasibility studies. Investment loans are provided under strict eligibility conditions to large-scale projects with proven economic viability.

IFIs play a crucial role in financing environmental investments by providing loans and credit guarantees, and assisting in project preparation. Project proponents face stringent requirements for receiving loans, including technical, economic, social and environmental feasibility criteria with which the project must comply. Municipalities face the challenge of insuring co-financing and projects large enough to meet economies of scale while reaching the minimum project size threshold as well. Thus, with this source of foreign finance, the main concern is the ability to use it and not its availability.

The most significant IFIs for the Republic of Croatia are: the European Bank for Reconstruction and Development; the European Investment Bank; the Council of Europe Development Bank and the World Bank. According to the Country Assistance Strategy, the overall sum of assistance to the water sector from the WB amounted to approx. 300 mil-

lion USD or 1700 million HRK for 2005-2007. The EBRD Assistance Strategy to the Republic of Croatia – 2005 indicates assistance to the water sector of EUR 38 million or HRK 280 million. IFIs assistance to waste sector has not been received from these institutions.

Within the PHARE project Developing the Capacity of Environmental Authorities through the Transfer of Best Practices on Use of Financial Resources and its Environmental Financing Strategy has been explored the basis of actual lending from IFIs and the average annual loans for environmental purposes in the period 2005-2011 has been calculated at approx. 140 – 400 HRK (for water sector basically) per year:

Since this annual loan amount stems from various IFIs, some general lending terms have been estimated, which are found to constitute a fair representation of the standard terms of the IFIs involved. The average lending terms presented below are based on the information on lending terms from the World Bank and the EIB.

Increased harmonization of environmental principles, practices and standards associated with the financing of projects among IFIs can be expected through introduction of the European Principles for the Environment (EPE). Through this common EU approach, the financing institutions will promote responsible stewardship and provide a consistent and visible mechanism for engaging with project sponsors in addressing environmental issues. In return, this will allow financing institutions to better manage credit and project risk related to the environment. The EPE signatories are the EBRD, EIB promote responsible stewardship, the Council of Europe Development Bank, the Nordic Environment Finance Corporation and, the Nordic Investment Bank<sup>7</sup>.

### Private sector involvement in financing

National governments play a crucial role in creating an attractive climate for environmental investment by creating and maintaining the necessary legal, institutional and economic conditions. In order to enhance private sector involvement in project funding, national governments could develop procedures and guiding materials for the implementation of public private partnership schemes.

Involvement of the private sector (companies, industries, commercial banks) in environmental financing can be seen from four perspectives:

- Involvement in public private partnerships for environmental projects;
- Investment in environmental improvements;
- Involvement in equity finance; and
- Commercial banks financing environmental and environmentally-related projects.



Table 3 Environmental spending by regional and local self-governments

ALL TOWNS /MUNICIPALITIES	2002	2003	2004	2005	2006
Total expenditure for environmental protection from the budget	422,786,140	522,274,812	594,979,689	638,459,487	782,742,000
Waste management	169,503,848	182,706,495	222,534,941	238,745,991	244,057,417
Wastewater management	91,442,518	139,585,463	172,445,003	173,212,692	212,929,865
Reduction of pollution	22,242,997	33,540,676	24,386,714	33,560,312	38,334,983
Biodiversity	18,064,508	56,326,416	24,066,726	40,948,953	49,458,136
Research and development	7,679,924	4,243,836	13,789,117	17,833,893	29,603,546
Other services	113,852,343	105,871,929	137,757,188	134,157,646	208,358,053
All Counties	2002	2003	2004	2005	2006
Total expenditure for environmental protection from the budget	27,276,403	40,494,951	53,204,571	61,202,171	62,931,948
Waste management	3,394,722	6,309,029	7,316,128	18,420,922	19,361,303
Wastewater management	7,405,333	13,956,569	10,561,888	13,301,605	15,679,527
Reduction of pollution	1,107,939	681,215	2,367,694	5,130,051	5,294,802
Biodiversity	3,549,925	6,191,528	3,829,549	3,545,895	3,346,119
Research and development	6,887,330	7,042,655	7,356,406	4,019,557	5,114,692
Other services	4,931,154	6,313,955	21,772,906	16,784,141	14,135,505
TOTAL spending by towns, municipalities and counties					845,673,948

Source: Statistical bureau, Croatia

Private sector involvement in environmental infrastructure projects in the form of public private partnerships (PPP) is in the initial stage of development in the Republic of Croatia. Various ways of private sector involvement can bring many benefits to the public sector such as additional staff, investment capital, expertise in project preparation, management and implementation, and access to new technologies. Involvement may take the form of technical assistance, turnkey contracts, operating contracts or full privatization. A successful example of such partnership is the wastewater treatment plant in Zagreb, Croatia.

Venture capital refers to equity investments made for the launch, early development, or expansion of a business. Venture capital investment may contribute to

development of local environmental markets while increasing the sustainable operation of businesses. The importance of venture capital for sustainability is expected to increase in the coming years.

Commercial banks are also becoming increasingly interested in providing loans to environmental projects. On the one hand, commercial banks are paying more attention to socially- and environmentally-responsible investment, and on the other, they introduce financial products accessible for environmental projects. However, their support to environmental projects is at an early stage and therefore very limited at present. More often they work as intermediaries of international financing institutions.

Table 4 Forecasted spending from IFIs, million HRK

	2005	2006	2007	2008	2009	2010	2011
WB for water	100	185	348	348	348	248	163
EBRD for water	37	37	57	57	57	19	19

Source: Data from IFIs representatives in the Republic of Croatia



In the Republic of Croatia, several commercial banks provide loans for environmental projects (e.g. Zagrebačka Banka, HYPO Alpe Adria Bank, HBOR). They support remediation of landfills and dump sites, promotion of prevention and reduction of waste production, protection and conservation of biological and landscape diversity, promotion of cleaner production, promotion of use of renewable energy sources, and promotion of sustainable construction and sustainable transport.

#### Climate change-driven mechanisms

The Kyoto Protocol to the United Nations Framework Convention on Climate Change from 1997 is a response to the growing attention to climate change. The Republic of Croatia ratified the Kyoto Protocol in May 2007, and the implementing acts for setting up the procedures for projects regarding flexible mechanisms are expected to be developed in 2008.

Croatia is committed to individual, legally binding targets to limit or reduce its greenhouse gas emissions. The protocol enables a range of opportunities to finance the abatement of GHG emissions, such as clean development mechanism (CDM) or joint implementation (JI). The Republic of Croatia is eligible to use joint implementation which is designed to foster the transfer of technology and enhancement of carbon sinks.

As part of compliance with its Kyoto obligations, the European Union started a pilot phase of an EU-wide cap-and-trade emissions trading system (EU ETS) in January 2005, with explicit linkage to the market for CDM and JI credits. The EU ETS will start in 2008. The scheme allows linking to CDM and JI under Kyoto and liable actors under the EU ETS may convert CDM and JI credits from 2008 and 2012 to cover their emissions. The system currently covers CO<sub>2</sub> emissions from the power and heating sector, oil refineries, coke ovens, the ferrous metal industry, cement makers, and ceramics factories. Financial institutions expect a rapid increase in overall trading volume in the EU ETS. Emission trading can be an opportunity to receive additional financial resources for the Republic of Croatia where GHG emissions are lower than Assigned Amounts Units (AAUs). Proceeds from the sale of AAUs can be used to finance GHG-abating projects and other programs. Based on this, the countries might establish green investment schemes in which AAUs are earmarked to GHG reduction projects and programs or used to support policies and measures leading to emission reduction and capacity building<sup>8</sup>.

One of the main barriers to private financial sector involvement in climate change instrument financing is the lack of clear climate policy framework post-2012. Currently, the political timeframes

built into the regime are not well aligned with investments, which need clarity over a 10- to 20-year period. As a result, the incentive for financial players to invest in long-term clean energy projects is rather limited. A typical project has a working life of 10 to 20 years and only generates profit after setup costs have been repaid, usually several years.

### 5. Need for Environmental Investment and Environmental Investment Drivers

In the Republic of Croatia, the need for environmental investment is mainly driven by the EU accession process. The investment challenge is associated with implementation of major 15-20 key investment-heavy directives. It is estimated that EUR 6 billion to EUR 12 billion will be needed to comply with EU environmental *acquis*. Assessment of available national funds is ongoing under the Phare project, and results are expected by the end of 2007.

#### Decentralization process

The ongoing process of decentralization in the Republic of Croatia shifted the responsibilities for developing environmental infrastructure and providing environmental services to local authorities. State budget transfers to local authorities have historically played an important role in financing environmental infrastructure. During transition this source of finance dried up. Local authorities have turned to other sources such as environmental funds or attracting the involvement of the private sector.

#### The polluter pays principle

In the process of motivating the private sector to invest in environmental improvements, a special role is taken by economic instruments and environmental permitting. It is generally accepted that environmental policy instruments, such as economic instruments, should provide incentives for enterprise investments to pay for investments needed to reduce the pollution in accordance to the polluter pays principle. Enterprises should invest in pollution prevention, treatment and control of their companies. Municipalities investments are linked to national policy goals (infrastructure development for water supply, wastewater treatment, solid waste management and district heating), and the polluter pays principle is implemented through applying service charges and fees on the end users. This principle provides for exceptions in transition periods.

Affordability can be the main constraint and limitation for municipality in implementation of polluter-pays principle. Therefore, public budgets in the short term and medium term will have an essential role in financing rehabilitation and capital investments and in



Table 5 Standard conditions of loan financing

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providing social protection to overcome affordability problems while facilitating access to credits.

In the Republic of Croatia formally utility sets prices and the municipality approves them. There are other, strictly earmarked charges that the municipality may set directly for financing the environmental infrastructure (construction of landfills, water supply, sewage and waste treatment facilities). Utility prices cover operational and maintenance costs in principle but may also include the amount for financing the capital costs, which is allocated to the local budget. The investment must be a part of the yearly Program for Construction of Infrastructural Facilities and Devices, adopted by the representative body of the local unit. Tariffs setting system is multi-annual. Affordability is determined by the income of households, the level of consumption, tariff policy, subsidy schemes and the level of payment collection.

The EU requires the adoption of the polluter-pays principle. Therefore, in the future full cost recovery user charges will have to be the main source of financing so as to meet the polluter pays principle.

#### Liability and compensation schemes

The EU Environmental Liability Directive (2004/35/EC) entered into force in 2007. The direc-

tive is based on the polluter-pays principle and covers liability for damage to water sources, land and soil, and natural habitats. Damaged environments need to be restored to their baseline conditions. Through the legislation the countries will shift the responsibility for repairing environmental damage to polluters, with costs being covered by polluters through the development of appropriate financing system such as compulsory guarantees or insurance. This may stimulate more environmentally friendly behavior by companies and spur the introduction of subsidy schemes for past pollution.

The directive could have several economic impacts:

- \* on introduction of fines and noncompliance penalties for breaches of emission standards;
- \* on the need for insurance on the risk of liabilities; and
- \* on the prices of products.

As companies will be looking for options to insure against potential of environmental damages, a new market will open for insurance companies. At present the limiting factor is the lack of fully reliable methods for valuing environmental damage. Companies affected by the directive will invest in changes in production decisions, clean technologies, location of

Table 6 Total national investment in environmental protection in the period 2004-2006 (million HRK)

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<b>Environmental protection – total</b>	<b>1308</b>	<b>1460</b>	<b>1760</b>

Source: Report of the Central Bureau of Statistics, *Environmental Protection Investments 2004, 2005, 2006*.



Table 7 Environmental spending by regional and local self-governments

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TOTAL spending by towns, municipalities and counties					845,673,948

Source: Statistical bureau, Croatia

production, and in eco-innovation solutions. Experience shows that liability schemes lead to behavioral changes in companies and in consumer choices.

In the Republic of Croatia, the Environmental Protection Act (OG 82/94, 128/99) prescribes environmental liability of a legal or natural person who causes pollution in the environment. A polluter is liable for any damage on the environment based on the principle of strict liability in accordance with the rules of civil law. A polluter is obliged to take all necessary measures in order to reduce the damage and, in specially endangered areas, must make and implement a remediation program for the damaged site.

### The role of economic instruments

Economic instruments play a very important role in directing money toward specific policy justified behaviors in the market. Broad application of economic instruments could stimulate environmentally friendly behavior of polluters and other market players and, through this, stimulate investment in environmental improvements.

Environmental fiscal reform (EFR) refers to a range of taxation or pricing instruments that can raise revenue, while simultaneously furthering environmental goals<sup>9</sup>. It mobilizes revenue for governments, improve environmental management practices and conserve resources. EFR encompasses a wide range

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Source: Data from IFIs representatives in the Republic of Croatia



of taxation and pricing instruments. Shifting of „distorting taxes” such as labor, income, capital and consumption tax to environmentally related tax can result in a welfare gain. It can improve the functioning of the market, which could result in better employment opportunities and technological innovation (capital). This may also attract investors and stimulate environmentally friendly behavior.

## 6. Conclusions

The roles of public and private sector involvement in financing environmental infrastructure projects are changing. On the one hand, public sector is more involved in management and enforcement, while the private sector becomes engaged in providing environmental services and investing in environmental infrastructure. The process of decentralization is shifting many environmental responsibilities onto the regional and local level. Together with the EU regional approach toward future financial assistance it poses a major challenge for regional and local authorities. In this case, decentralization is creating demand for better environmental services at the local level, while public awareness and willingness to pay for environmental improvements are increasing.

In order to increase financing from external sources more attention should be devoted to the foreign direct investment (FDI) that promote

sustainability by attracting the investments that improve efficiency of environmental resource use, foster development, transfers and implement more environmentally friendly technologies as well as encourage the adoption of higher standards of environmental responsibility.

Beside external sources of finance, it is of high importance for the Republic of Croatia to develop and increase the efficiency of domestic sources of environmental finance. According to the polluter pays principle, user charges are source of sustainable financing for environmental utility services. Therefore, new policies and programs, including the national environmental action programs, accession strategies, and economic instruments encourage the implementation of the polluter-pays principle. Main objective is to move from partial to full cost recovery.

Integration and combination of public and private sources of finance play a crucial role in successful implementation of environmental projects. Private sector involvement requires the establishment of mechanisms that will facilitate private sector contributions to public sector infrastructure projects. This mechanism needs to improve access to environmental finance, to integrate environmental concerns into economic development, to strengthen capacity for environmental financing and focus on public private partnerships. ■

## NOTES

1 Croatia: Screening Report 2007

2 Key “investment-heavy” directives include: the Urban Wastewater Treatment Directive, Drinking Water Directive, Dangerous Substances into Water Directives, Nitrates Directives, Landfill Directive, Municipal Waste Incineration Directives, Hazardous Waste Incineration Directive, Packaging Waste Directive, Large Combustion Plants Directive, Fuel Quality Directives, Air Quality Directives, IPPC Directive, VOC Solvents Directive. 3 Research was conducted under the PHARE project “Developing the Capacity of Environmental Authorities through the Transfer of Best Practices on Use of Financial Resources in the Republic of Croatia.”

4 Environmental Protection Operational Programme 2007-2009 (Draft), Instrument for Pre-Accession Assistance, p. 19. Croatia, Zagreb, November 2007.

5 Data conducted from the Delegation of the European Commission to the Republic of Croatia.

6 Data conducted from the Delegation of the European Commission to the Republic of Croatia.

7 <http://www.eib.org/infocentre/epe/signatory-banks/index.htm>

8 [http://ec.europa.eu/environment/climat/emission/linking\\_en.htm](http://ec.europa.eu/environment/climat/emission/linking_en.htm)

9 The International Bank for Reconstruction and Development (IBRD) (2005), *Environmental fiscal reform – What should be done and how to achieve it*, Washington DC, USA, May 2005.

## BIBLIOGRAPHY

Central Bureau of Statistics (2004, 2005, and 2006), First releases: *Environment 2004, 2005, 2006*, 10 November 2007.

Environmental Protection Operational Programme 2007-2009 (Draft) Instrument for Pre-Accession Assistance, Zagreb, November 2007.

European Commission (2007), *Croatia: Screening Report 2007*, Chapter 27 – Environment, Brussels, 1 February 2007.

Government of the Republic of Croatia (2006), *Strategic Development Framework 2006-2013*, Zagreb: Central Office for Development Strategy and Coordination of the EU Funds.

The International Bank for Reconstruction and Development (IBRD) (2005), *Environmental fiscal reform – What should be done and how to achieve it*, Washington DC, USA, May 2005.

Ministry of Environmental Protection, Physical Planning and Construction (2002), *National Environmental Action Plan*

(NEAP), Zagreb: Ministry of Environmental Protection, Physical Planning and Construction.

Organization for economic co-operation and development (OECD) (2007), *Environmental Finance: Trends in Environmental Finance in Eastern Europe, Caucasus and Central Asia*, EAP Task force.

Organization for economic co-operation and development (OECD) (2007), *Mobilizing finance for environmental priorities: Recommendations for the future*, Fifth joint meeting of the Task Force for the Implementation of the Environmental Action Program for Central and Eastern Europe (EASP Task force) and the Project Preparation Committee (PPC), Brussels, 15-16 March 2007.

Tišma, S., Ozimec, K. (2007), *Environmental Protection in Croatia, FORUM-Scientiae et sapientiae*, XIV (2): 38-43.