SUSTAINABLE DEVELOPMENT

POLICY AND ORGANIZATION OF NATURE AND ENVIRONMENTAL PROTECTION FUNCTION

HARMONIZATION WITH THE EU LEGISLATION

BASIC ENVIRONMENTAL INDICATORS

ACTIVITIES AND ACHIEVEMENTS IN HEP GROUP AREAS AND PLANTS IN 2010

POLICY AND ORGANIZATION OF NATURE AND ENVIRONMENTAL PROTECTION FUNCTION

HEP CONTINUOUSLY MONITORS and analyzes the impact of its business processes on the environment. The most important indicators of such impacts are emissions of pollutants into the air and quantity of production waste. The company reports on all environmental components timely and objectively to relevant institutions, units of local self-government and the interested public. Employees working in nature and environmental protection function attend seminars and workshops to get informed about duties and activities arising from environmental and nature protection legislation.

For employee education and information purposes, the Sustainable Development and Quality Improvement Department continuously follows and systematically in printed bulletins prepares overviews of legal requirements from the field of environmental and nature protection. Considering the large number of new or amended laws and regulations in 2010, the Department prepared a list and an analysis thereof, with an assessment of the implications for operations of HEP Group companies.

Technical support to these employees that are active in individual HEP Group companies is provided by the members of HEP's Team for Environmental Protection Coordination and Standardization. The basic task of the Team is to analyze and valuate the environmental activities in HEP Group with an emphasis on the planning, coordination, internal communication and preparation of proposals for improvements.

HARMONIZATION WITH THE EU LEGISLATION

OBTAINING ENVIRONMENTAL PERMITS

In the process of aligning Croatia's environmental legislation with that of the EU, the provisions of Integrated Pollution Prevention and Control (IPPC) Directive 2008/1/EC were transposed into the national Environmental Protection Act and into regulation on the procedure for the determination of integrated environmental requirements. The integrated environmental requirements ("environmental permits") are a condition for continued operation of all existing thermal power plants of HEP of rated thermal capacity above 50 MW and for obtaining a siting permit for new construction and reconstruction of existing plants. Coordinated by HEP's Team for the obtaining of integrated environmental requirements, analyses of the existing situation were prepared and discrepancies against Best Available Techniques were determined, and a proposal for alignment was prepared accordingly.

GREENHOUSE GAS EMISSIONS

By ratifying the Kyoto Protocol and conducting negotiations over the EU accession, Croatia has undertaken to reduce greenhouse gas emissions and to join the emission trading scheme (EU-ETS). HEP owns large combustion plants – thermal power plants –which emit large quantities of greenhouse gases into the atmosphere. From January 1, 2013, these plants will be part of the emission trading scheme for CO_2, meaning that HEP will have to buy all CO_2 emission rights at auctions and include these additional costs in the delivered product – electricity. To prepare HEP for the conditions of trading in greenhouse emissions, team for the implementation of Kyoto Protocol provisions has defined the actions to be carried out by the time of HEP's entry into the trading scheme. At the same time, for all large thermal power plants plans for the monitoring of greenhouse gases have been prepared.

ECOLOGICAL NETWORK

Upon the coming into force of the Regulation on Declaration of Ecological Network, some existing and some of planned HEP's plants, mostly listed in the Strategy and Program for Physical Planning of the Republic of Croatia and in relevant county physical plans, became a part of the ecologically significant areas and ecological corridors. After Croatia's entry into the EU, the National Ecological Network will become an integral part of the ecologically significant area of EU – NATURA 2000. Under the provisions of the Environmental Protection Act and the Regulation, protected areas and ecological network areas are subject to guidelines for protection measures applicable to all physical and legal persons using natural resources and performing actions or operations under the Act in these areas, HEP included. The protection measures laid down in the Act and in the Regulation pose uncertainty on construction of planned or continued operation of existing HEP's generating plants, and thereby on energy production and security of customer supply. They also make it harder to meet the obligations arising from national and EU legislation concerning reduction in greenhouse gases and other pollutant emissions into the air as well as to implement some of the work on regular plant maintenance, nature protection and safety at work, and they influence energy production costs.

BASIC ENVIRONMENTAL INDICATORS

AIR EMISSIONS

During 2010, HEP continued to monitor pollutant emissions into the air – sulfur dioxide (SO_2), nitrogen oxides (NO_x), carbon dioxide particulates as required by air quality legislation.

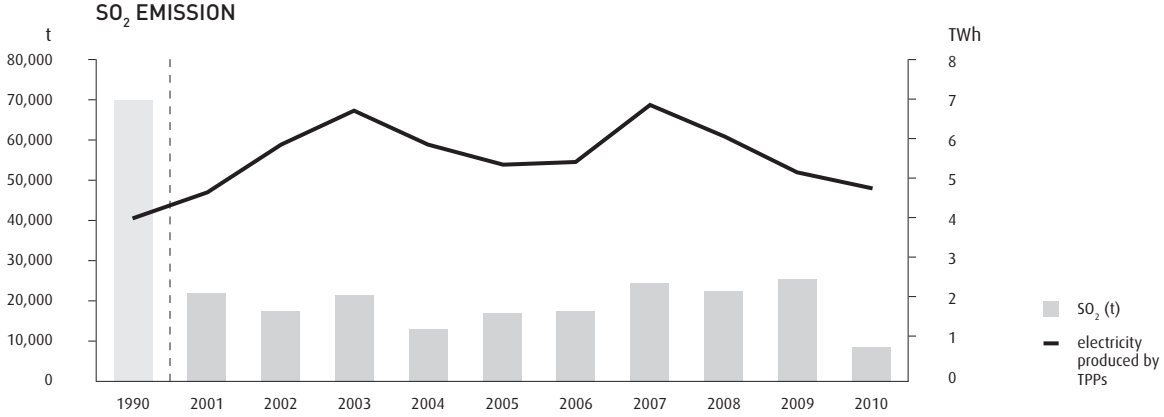
Pollutant emissions into the air come predominantly from HEP's large combustion plants – thermal power plants TE-TO Osijek, Sisak, TE-TO Zagreb, EL-TO Zagreb, Jertovec, Rijeka, Plomin 1 and Plomin 2. In 2010, total electricity production from HEP's thermal power plants decreased in comparison with 2009 by about 7.5 percent, thanks to higher hydroelectric production and favorable conditions on electricity markets.

Therefore, compared to 2009, consumption of high-sulfur fuel oil decreased by about 350,000 tons and consumption of environmentally acceptable natural gas increased by about 90 million m^3. The new unit L at TE-TO Zagreb, built in accordance with Best Available Techniques, contributed to the increased gas consumption. The increased coal consumption in 2010 compared to 2009 did not contribute to pollutant emissions because the additional 265,000 tons of coal spent by Plomin 2 thermal power plant is equipped with low NO_x burners, electrostatic precipitator for reduction in emissions of solid particulates and a desulphurization plant.

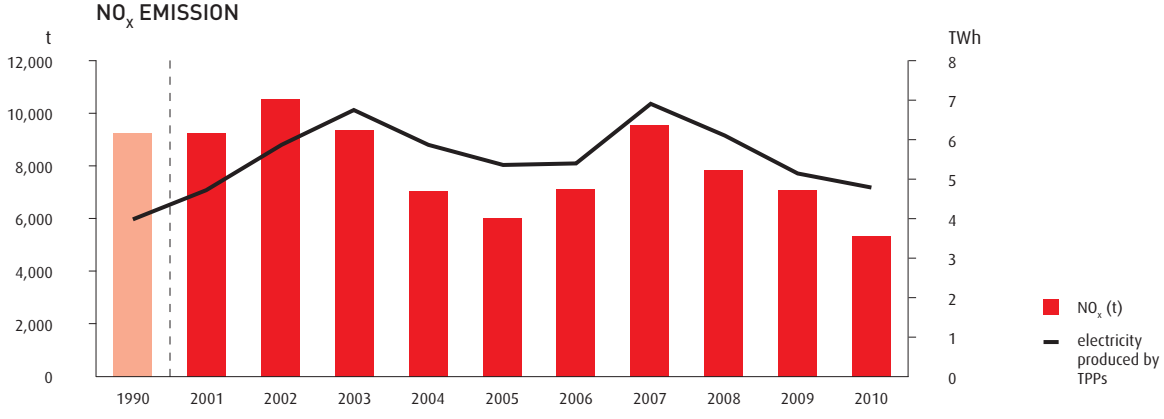
EMISSION TREND OF AIR POLLUTANTS FROM HEP'S THERMAL POWER PLANTS (1990) 2001-2010

Year	SO_2 (t)	NO_x (t)	CO_2 (kt)	Particulates (t)	Electricity produced (GWh)
1990	*69,402*	*9,248*	*3,750*	*2,031*	*4,030*
2001	21,669	9,222	4,347	1,382	4,713
2002	17,248	10,544	5,259	1,135	5,899
2003	21,350	9,391	5,679	1,507	6,703
2004	13,081	7,051	4,503	767	5,899
2005	16,890	6,003	4,694	664	5,387
2006	17,258	7,092	4,544	954	5,436
2007	24,376	9,532	5,460	756	6,845
2008	22,165	7,834	4,862	566	6,075
2009	24,956	7,031	4,043	651	5,178
2010	8,277	5,318	3,899	313	4,787
Change 2010/ 2009 (%)	**-67**	**-24**	**-4**	**-52**	**-7.5**

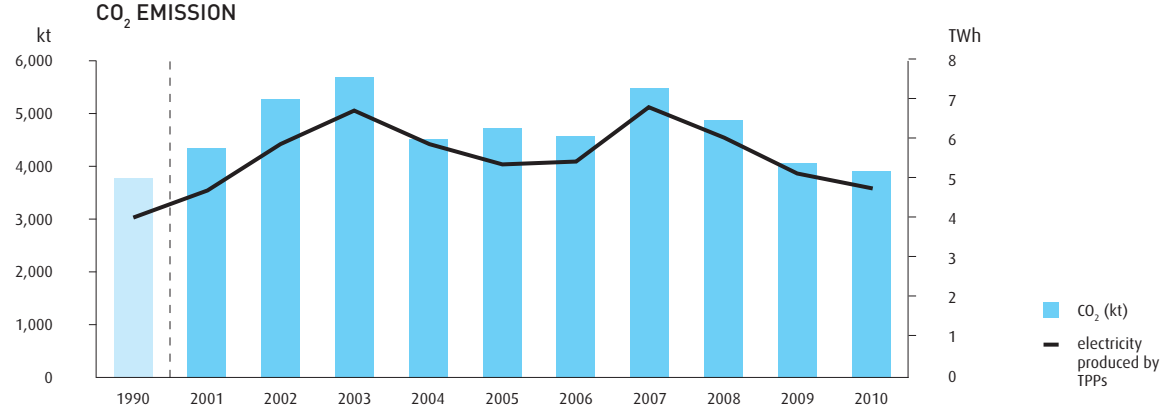
SO_2 EMISSION



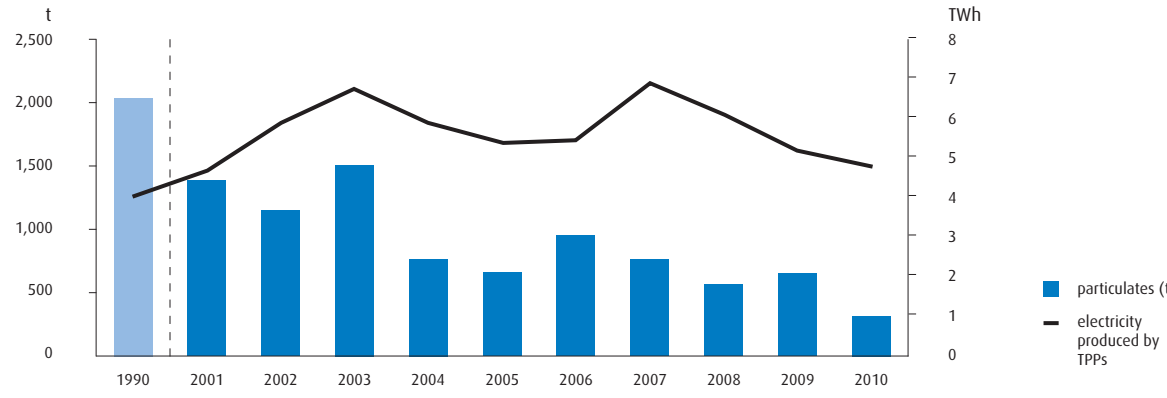
NO_x EMISSION



CO_2 EMISSION



PARTICULATES EMISSION



WASTE

During 2010, the years-long trend of improving waste management system continued by investing in existing and new temporary waste storages and in employee education to which special attention is paid

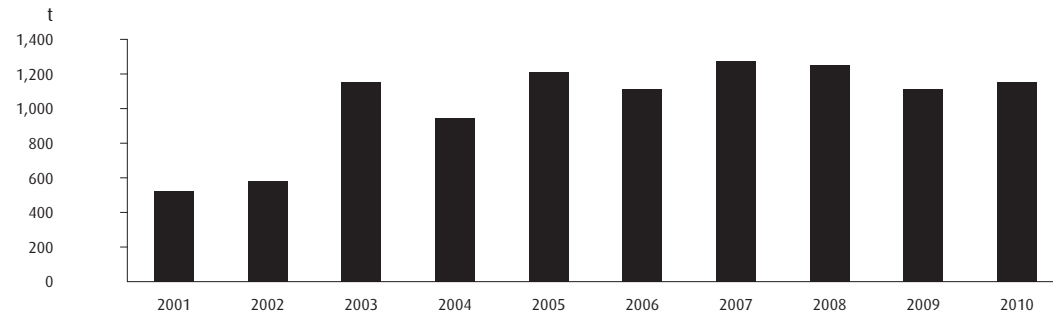
The plants continued to build and equip temporary storages for waste and secondary raw materials and furnish them with tanks for separate waste collection. In all HEP Group plants the managing of waste data electronically using the application "Waste Management" continued.

In order to fulfil the obligations specified in the Chemicals Act, the application Chemicals Consumption Inventory has been implemented The application was developed in HEP with support of the IT and Telecommunications Department of HEP d.d. For the purpose of education and introduction to work with the application, workshops were held for all HEP Group companies which use hazardous chemicals.

TOTAL QUANTITIES OF HAZARDOUS AND NON-HAZARDOUS WASTE GENERATED WITHIN HEP GROUP 2001-2010

Year	Hazardous waste (t)	Non-hazardous waste (t)
2001	518	76,717
2002	577	98,492
2003	1,148	111,292
2004	940	92,067
2005	1,209	124,820
2006	1,112	134,336
2007	1,269	105,569
2008	1,243	107,623
2009	1,110	88,405
2010	1,152	93,185
Change 2010/ 2009 (%)	**+4**	**+5**

TOTAL QUANTITIES OF HAZARDOUS WASTE GENERATED WITHIN HEP GROUP



TOTAL QUANTITIES OF NON-HAZARDOUS WASTE GENERATED WITHIN HEP GROUP

In 2010, a total of 1,152 tons of hazardous waste and 93,185 tons of non-hazardous waste was produced in HEP Group. Larger quantities of generated waste compared to 2009 are a result of increased production by coal-fire power plants and/or disposal of their by-products – ash, slag and gypsum. All of the generated waste was handed over to authorized collectors, exporters or processors for further processing and final disposal.

WATER

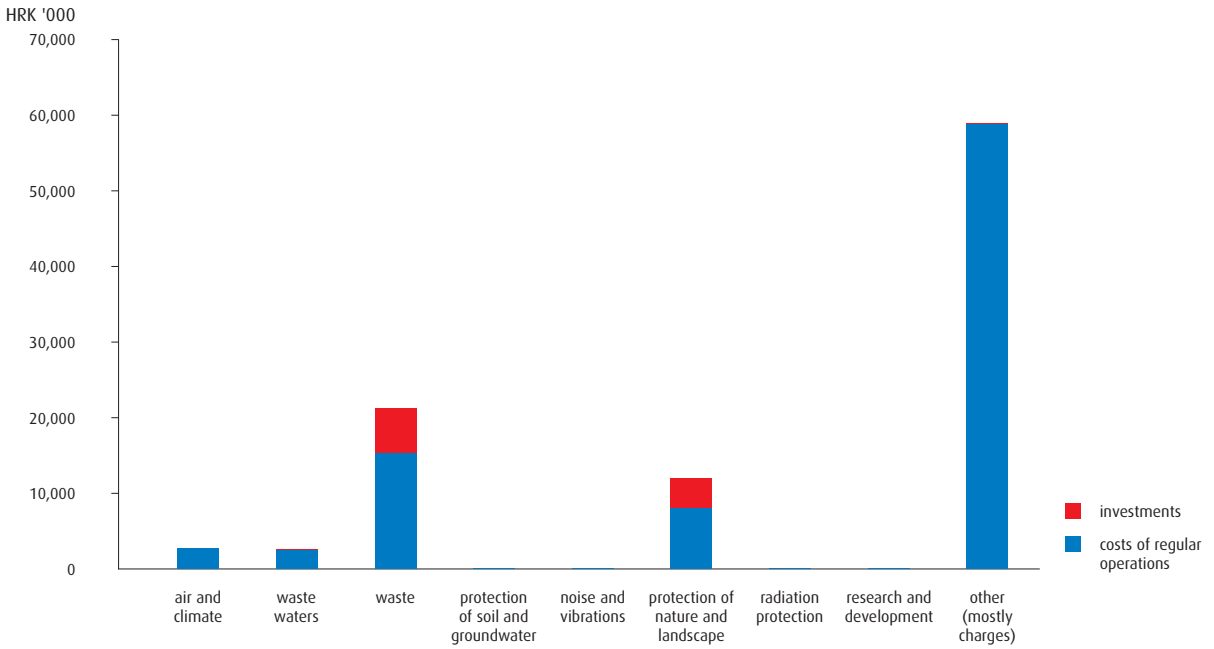
According to the results of water quality analysis conducted in 2010 by authorized laboratories in accordance with water rights documents, all HEP's plants operated in compliance with permits and legal requirements.

EXPENSES FOR ENVIRONMENTAL AND NATURE PROTECTION

In 2010 total expenses for nature and environmental protection incurred by HEP Group companies amounted to a little more than 97.5 million kuna. The most significant investments in 2010 were those made to improve waste management system in HEP's plants and to protect nature.

EXPENSES FOR NATURE AND ENVIRONMENTAL PROTECTION IN 2010 ACCORDING TO RETZOK REPORTS

Environmental area	**Costs of regular operations** (HRK'000)	**Investments** (HRK'000)
air and climate	2,726	0
waste waters	2,491	118
waste	15,284	5,916
protection of soil and groundwater	31	0
noise and vibrations	14	0
protection of nature and landscape	8,051	3,892
radiation protection	84	0
research and development	57	0
other (mostly charges)	58,769	97
TOTAL	**87,507**	**10,023**



ACTIVITIES AND ACHIEVEMENTS IN HEP GROUP AREAS AND PLANTS IN 2010

WASTE AND WASTE WATER MANAGEMENT

- Replacement and disposal of PCB-containing condenser batteries was carried out from all transformer stations 10(20)/0.4 kV at more than 1,500 locations in nine distribution areas of HEP ODS, of a total mass of more than 40 tons.
- Repair and improvement of waste water drainage system was carried out in the plants of Rijeka TPP, Sisak TPP, EL-TO Zagreb CHP, Čakovec HPP, Elektra Slavonski Brod and Elektra Križ.
- Cleaning and testing of water-tightness was carried out on the waste water drainage system in the plants of Sisak TPP, EL-TO Zagreb CHP, Varaždin HPP, Elektra Čakovec, Elektra Zabok and Elektra Virovitica.
- Operational plans for emergency water pollution measures were adopted as well as rules on operation and maintenance of drainage structures for individual transformer stations in the area of Elektroslavonjja, Elektra Čakovec and Elektrojug.
- Waste management plans were adopted by the plants of Hydro Production Area South, Sisak TPP, Elektra Koprivnica, Elektra Karlovac, Elektroslavonija, Elektra Vinkovci and Elektrojug.
- A system for collection and drainage of waste waster was built and tested in the area of the new 110/20(20)-30/10 kV Podi transformer station.
- A new water treatment plant was built at Sisak TPP. Thus an optimum use of chemicals during an automated water treatment process was achieved as well as raw water savings and reduction in waste water production.
- Reconstruction of concrete channels and replacement of ELLU pipeline for supply to Plomin 1 TPP and Plomin 2 TPP was carried out.
- Measuring equipment and a control valve were installed on the slag scraper for makeup raw water. The estimated water savings are about 3,000 m^3/year, production of waste water is reduced as well as use of chemicals at Plomin 1.
- The internal drainage system of TE-TO Zagreb CHP is connected with the public drainage system and/or with the newly built main drainage collector for waste water treatment. For connection purposes, a pre-pumping station was built with an electrical plant and a separator of oily water from the fuel oil facility area.
- At TE-TO Osijek CHP, the project of cooling water return to use the waste water again for cooling system purposes was carried out.

AIR QUALITY IMPROVEMENT

- At TE-TO CHP, the construction of a hot water boiler VK 4 was completed and boiler tests and settings began.
- In cooperation with the Technical Faculty Rijeka, a mathematical model was made of dispersion and distribution of pollutants from flue gases of Rijeka TPP. To maximize the accuracy of meteorological data, an autonomous weather station was procured.
- The preparation began of study documentation for the construction of a DeNOx plant at Plomin 2 TPP.
- At TE-TO Zagreb, reconstruction of the main stack of 202 m in height was carried out after which the stack was put into operation for another 30 years.
- HEP Toplinarstvo d.o.o. began works to convert the boiler plant Vidrićeva in Velika Gorica from a liquid fuel to a gas fired plant. The project is to improve energy efficiency of the boiler plant and significantly reduce pollutant emissions into the environment.

BIOLOGICAL DIVERSITY CONSERVATION PROJECTS

- Based on the Cooperation Agreement made between HEP and the Ministry of Culture (2004) the implementation of measures to protect the protected species of the white stork (*Ciconia ciconia)* continued. Based on the Cooperation Agreement on the monitoring of the population and ringing of storks in the area of Sisak-Moslavina County of 2005, additional measures continued to be implemented in the area.
- Based on an agreement between HEP Operator distribucijskog sustava d.o.o. and the Ministry of Culture, Directorate for Nature Protection of September 2009, distribution areas systematically monitored bird casualties from electric shock on medium-voltage distribution lines and other plants in order to determine critical parts of the network. These plants (overhead lines, switches and pole-mounted substations) were fitted with insulation material to protect the birds from electric shock.

- Natural Resources Management Plan was prepared for the hydroelectric system of Production Area North, which includes the manner of using natural resources and conditions and measures for nature protection prescribed by the Ministry of Culture.
- In the area of Hydro Production Area North, inventory taking and marking of habitats of certain species: orchids (*Orchidaceae*), tamarisks (*Myricariagermanica (L.) Desv.)* and beavers (*Castorfiber L.)*
- In the area of Hydro Production Area North, in spawning locations water level is controlled during spawning, incubation and early development of the larvae, and stocking of the hydroelectric system with fish which regulate the invasive species of molluscs and water plague is co-financed.
- At the recommendation from the Faculty of Forestry University of Zagreb, a metal grid was placed on the pipeline outlet to the right drainage channel of Čakovec HPP to protect from wood material created by beavers building dams being deposited and the trees close to the pipeline outlet were removed.

OTHER

- In the transformer station 10/0.4 kV No. 140 in Šibenik, equipment for noise and vibration reduction was installed.
- In Rijeka TPP, Plomin TPP and Elektra Virovitica, lighting fixtures were replaced with energy-efficient lighting fixtures that do not cause light pollution.
- In the area of TE-TO Zagreb, reconstruction of the damaged incoming channel was carried out as well as of the junction of incoming channel and the Sava River, part of the crest of primary and secondary gates along the left and right shore of the river, and part of the access road along the embankment.