

Sustainable  
Development



# Sustainable Development

## 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 department attend seminars and workshops to get informed about duties and activities arising from environmental and nature protection legislation. Technical support to these employees is provided by the Sustainable Development and Quality Improvement Department of HEP d.d. and members of HEP teams: the Team for Coordination and Standardization of Environmental Business Procedures, the Team for the Implementation of the Kyoto Protocol provisions and the Team for Obtaining the Integrated Environmental Requirements. The fundamental objective of the Team for Coordination and Standardization of Environmental Business Procedures to analyse and evaluate environmental activities in HEP Group emphasizing planning, coordination, internal communication and proposals for improving environmental activities. In light of a significant influence on HEP Group operations, planning the operation of the existing generation facilities and the construction of the new ones, the Team for the implementation of the Kyoto protocol provisions was established with its main task of setting up the greenhouse gas emission trading system in HEP Group and coordinating the work of departments and companies within the *third trading period* (from 2013 – 2020) as well as preparation of HEP Group for the period after 2020.

The Decision on the Integrated Environmental Requirements is a precondition for further operation of the existing and one of the preconditions for obtaining the location permit for the reconstruction of the existing and the construction of new thermal power plant facilities of nominal thermal power higher than 50MW. Therefore, the objective set before the Team for obtaining the integrated environmental requirements in the cooperation with the authorized personnel with the permit from the Ministry of Environment and Nature Protection is to develop the alignment analysis of HEP's thermal power plants with the best available techniques, which will serve as a basis for developing plans and programmes for aligning those facilities which can be aligned in light of the life span of the existing thermal facilities within the set term.

## Harmonization with the EU legislation

### OBTAINING ENVIRONMENTAL PERMITS

During 2012, the procedure for obtaining the integrated environmental requirements for the existing thermal facilities of nominal thermal power exceeding 50 MW was continued. This procedure was initiated pursuant to the Environment Protection Act (Official Gazette 110/07) and the Ordinance on the process of determining the integrated environmental requirements (Official Gazette 114/08). Based on the alignment analysis of the facilities with the best available techniques and the paper on alignment methods and time-limits, in June 2012 HEP submitted to the Ministry of Environment and Nature Protection requests for obtaining integrated environmental requirements which intention is to maximally prolong the investment cycle in the existing facilities and prioritize the construction of new, replacement, more efficient and environmentally friendlier generation units. In line with the procedure on obtaining the integrated environmental requirements, the Ministry of Environment and Nature Protection submitted HEP's requests to relevant state bodies involved in the process to obtain their opinion for the purpose of issuing special conditions relating to environmental components outside the Ministry's jurisdiction. In September 2012, the Decision by the Ministry of Environment and Nature Protection on the integrated environmental requirements was obtained within the single procedure of environmental impact assessment for the replacement of the existing TE Plomin 1 for the purpose of its modernization and capacity increase.

### PREPARATION FOR GREENHOUSE GAS EMISSION TRADING

Croatia has become a part of the European Union Emission Trading Scheme at the beginning of the *third trading period* (from January 1, 2013 until December 31, 2020). By its membership in the EU ETS, HEP becomes obliged to buy greenhouse gas emission on the market in the volume of verified CO<sub>2</sub> emissions occurring as a consequence of electricity and a portion of heat energy generation, burning fossil fuels in thermal facilities of nominal thermal power exceeding 20 MW.

During 2012, the project titled 'Introducing HEP in the system of greenhouse gas emission trading' initiated in 2011 was completed, which purpose was to prepare HEP Group for the system of emission trading considering obligations taken from legal regulations regarding greenhouse emission reduction and climate change mitigation, risks occurring in the emission trading and the strategy used by European energy companies for hedging against price and volume risks. As the emission prices are influenced by a number of factors (market supply and demand ratio, weather conditions, economy and politics), the PLEXOS market simulator was used in the project for projecting CO<sub>2</sub> emission volumes as well as planning funds for emission purchase.

The system of CO<sub>2</sub> emissions trading in HEP Group was officially set up in late 2012 pursuant to the Decision of the Management Board of HEP under which obligations, responsibilities and time-limits for meeting obligations of individual departments and companies within HEP's emission trading system are set.

### EUROPEAN ECOLOGICAL NETWORK NATURA 2000

Areas of the National Ecological Network in Croatia encompass internationally important birds areas as well as areas important for other wild species and biotypes pursuant to the Bird Protection Directive (Council Directive 79/409/EEC; 2009/147/EC) and the Directive on the conservation of natural habitats and of wild flora and fauna (Council Directive 92/43/EEC). In light of its particular geographical position, Croatia has numerous biological variety of species and biotypes thus making the size of its territory in the National Ecological Network and the NATURA 2000 proposal one of the largest in Europe.

In the period between 2009 until today, HEP has repeatedly, in a written and oral communication with state bodies competent for the preservation of biological diversity, indicated the possible real obstacles and limitations in the operation of the existing and the construction of the planned electric facilities, to which the company has not received a satisfactory reply. Since 2007, the year of establishing the National Ecological Network, HEP has not constructed a single more significant investment project on the area of the ecological network. Therefore, real limitations regarding the execution i.e. increased project costs



Sustai

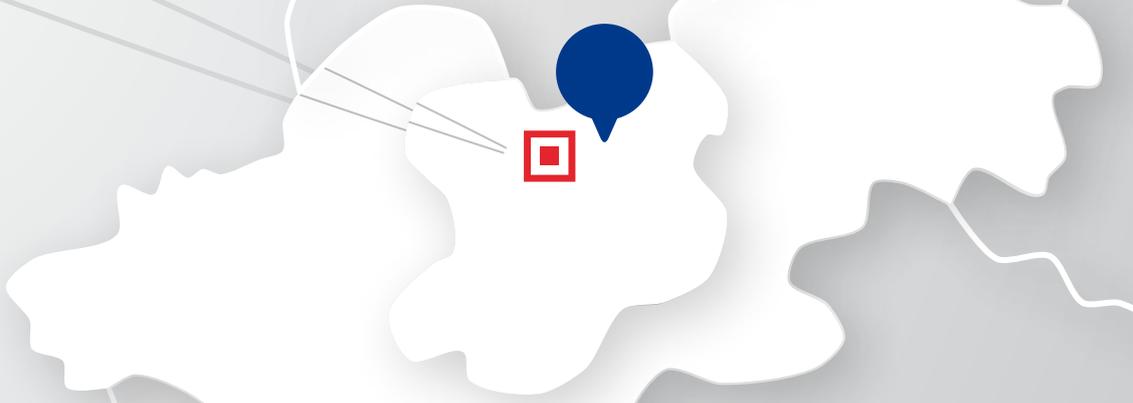


Zagreb, Croatia  
HEP



Bruxelles, Belgium  
European Commission

# nability



## EU ETS

The project of 'Introducing HEP into the European Union Emission Trading Scheme' was completed during 2012. Croatia joined the EU ETS on January 1, 2013.

will be seen and quantified only after some of these projects go through the process of environmental impact assessment i.e. after their delivery.

#### KEEPING UP WITH LEGAL REQUIREMENTS

To educate and inform the employees on obligations resulting from legal environmental regulations in a timely manner, since 2000 HEP Group has been following and monitoring systematically, in the form of monthly reports and annual printed bulletins, as well as preparing overviews of legal requirements in the area of environmental and nature protection of importance for operations and business of all HEP Group companies.

During 2012, improvements were continued and further expansion of the implemented electronic data bases were planned (the Register of Waste Generation and Process; the Register of Chemicals Consumption; RETZOK- Accounting Monitoring of Costs and Investments in Environmental Protection; Emission Verification – monitoring air-borne pollutant emissions and verification of greenhouse gas emissions), a part of HEP's IT Environmental Protection System which is currently being developed.

During 2012, workshops were held to inform and remind HEP employees of legal obligations in the area of waste management and how to maintain the registers at HEP Group level.

## Basic indicators

During 2012, HEP continued to monitor pollutant emissions into the air – sulfur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), carbon dioxide and particulates as required by air quality legislation, as well as the quantities of hazardous and non-hazardous waste generated within HEP and concentration of hazardous substances in waste water.

#### AIR EMISSIONS

Pollutant emissions into the air come predominantly from HEP's large combustion plants – thermal power plants Plomin 1, Plomin 2, TE-TO Zagreb, EL-TO Zagreb, TE-TO Osijek, Sisak, Jertovec and Rijeka while the remaining part of the pollutant emissions result from heating boiler rooms of HEP District Heating d.o.o. Compared to 2011, the year 2012 witnessed a decrease of all air emissions from thermal facilities as a result of increased, environmentally friendlier, share of natural gas compared to fuel oil. As of January 1, 2012 HEP has been procuring only a low-sulphur fuel oil which has resulted in additional decrease of air pollutants.

#### EMISSION OF AIR POLLUTANT SUBSTANCES IN 2011 AND 2012

Year	HEP's companies	NO <sub>x</sub>	SO <sub>2</sub>	Solids (PM10)	CO <sub>2</sub>
		t/year	t/year	t/year	t/year
2011	HEP-Generation d.o.o.	6,128.76	9,848.82	220.12	4,034,423.44
	HEP-District Heating	46.74	244.81	10.71	66,573.30
	<b>TOTAL</b>	<b>6,175.50</b>	<b>10,093.63</b>	<b>230.83</b>	<b>4,100,996.74</b>
2012	HEP-Generation d.o.o.	5,069.24	7,939.62	176.44	3,668,774.54
	HEP-District Heating d.o.o.	86.55	115.60	2.28	57,499.89
	<b>TOTAL</b>	<b>5,155.79</b>	<b>8,055.22</b>	<b>178.72</b>	<b>3,726,274.43</b>
<b>2012/2011 (%)</b>		<b>-16.51</b>	<b>-20.20</b>	<b>-22.57</b>	<b>-9.14</b>

## WASTE

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 was paid. All HEP Group companies and 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 plants the managing of waste data electronically using the application "Waste Management" continued. In 2012, a total of 2,258.68 tons of hazardous waste and 103,518.73 tons of non-hazardous waste was produced within HEP Group. Larger quantities of generated waste are a result of replacing out-dated equipment containing hazardous substances, increasing record-keeping quality of generated waste volumes and separation of individual waste types for the purpose of its recycling i.e. disposal compared to previous periods in all HEP organizational units. All of the generated waste was handed over to authorized collectors, exporters or processors for further processing and final disposal.

### TOTAL QUANTITY OF HAZARDOUS AND NON-HAZARDOUS WASTE GENERATED IN 2011 AND 2012

Year	Hazardous waste (t)	Non-hazardous waste (t)
2011	1,574.00	116,236.00
2012	2,258.68	103,518.73
2012/2011(%)	43.5	-10.9

### EXPENSES FOR ENVIRONMENTAL AND NATURE PROTECTION

In 2012, total expenses for nature and environmental protection incurred by HEP Group companies amounted to HRK 101.19 mn and remained at the level from 2011. The most significant investments in 2012 were the projects to improve waste management system in HEP's plants, to protect nature and the environment and to invest in soil and underwater protection.

## Major achievements in 2012

### AIR QUALITY IMPROVEMENT

- In TE-TO Zagreb the assembly work on the reconstruction of the firing plant of the high-pressure K-3 boilers (unit C) was completed as well as accompanying changes on the K-3 management, operation, supervision and protection system. The boiler's natural gas operation was functionally tested and adjusted. Measured emission values for natural gas fired plants are significantly lower than legally prescribed border limits. Operational adjustment and testing boiler's fuel oil fired operation are currently underway.
- The reconstruction of the pressure system of the VK-5 hot-water boiler was also completed, new equipment in boiler's natural gas and fuel oil firing system assembled as well as boiler operation and supervision system, burning process operation and power management systems. Natural gas operation stability adjustment and testing were successfully conducted. These activities are currently being performed on the fuel oil firing system.
- In EL-TO Zagreb the replacement of the VK3 boiler burner was conducted. The boiler is currently undergoing a trial run as well as functional testings and required adjustments of its operation with regard to natural and fuel oil.
- In Plomin TPP flue gas system optimization was conducted to balance flow speed within flue gas canals. A part of the nozzle in the absorber was changed during the overhaul and deflection plates into the flue gas canal installed. Optimization aimed at a better flue gas flow at its entry into the desulphurization plant resulting in a more efficient SO<sub>2</sub> elimination.
- The wet ash disposal plant was built for the purpose of decreasing fugitive emissions from the ash disposal site.
- In HEP TSO d.o.o. volumes of SF<sub>6</sub> greenhouse gas were recorded, emission evaluation conducted and data submitted to the Ministry of Environment and Nature Protection and the Environmental Protection Agency.
- 2,830 m of hot water network with preinsulated pipes was replaced in the local boiler plants of HEP District Heating d.o.o. which will result in decreased losses in heat energy transmission and lower air pollutant emissions.
- The gasification project (replacement for liquid fuel oil) of Slavonska 6 boiler room, Samobor was completed. Its installed capacity is 11.8 MW which results in lower air pollutant emissions.
- In the Sisak Plant of HEP District Heating d.o.o. return condensate from Brzaj TS to TS 1 in Caprag connected with return condensate to Energana was conducted. The construction of return condensate and the steam pipeline from Energana to Sisak TPP is currently in its final stage. The construction of the new steam pipeline and the new C Unit in Sisak TPP will end the need for steam production in Energana. All projects contribute to decreasing heat energy losses and emission volumes.
- 2,280 m of hot water network with preinsulated pipes were replaced in the Osijek plant of HEP District Heating d.o.o. which will result in decreased losses in heat energy transmission and lower air pollutant emissions.
- By using the TEODSG programme package (technical and economic optimization of the heating remote system) in the heating network plant of HEP District Heating d.o.o., the simulation of the central heating system at various outdoor temperatures was conducted. Based on the results, the generating source (heating plant) 'driving curve' was adjusted thus achieving significant fuel savings and decreasing air pollutant emissions.
- The reconstruction of the central heating and air conditioning based on the heat pumps principle was conducted in Elektra Zagreb on the business premises at the address of Kršnjavoga 7. Significant electricity savings are expected (38% in summer, 10% in winter) as well as natural gas savings (55%).
- For the purpose of preventing gas leaks into the environment, HEP Gas d.o.o. repaired damaged gas lines and conducted control of gas network tightness.

### WATER PROTECTION

- In Plomin TPP the return of wastewater from the wastewater processing plant was conducted, and the use permit obtained. This measure was proved to be 90% efficient. The 10% efficiency is expected by adjusting water return rate.
- In EL-TO Zagreb the hydrant network pipeline was replaced due to high losses of drinking water
- In Sisak TPP water tightness of a portion of the internal sewage system next to the transformer was recovered.
- In TE-TO Osijek water tightness of rainfall sewage and accompanying facilities for wastewater drainage was recovered.
- In Čakovec HPP and Dubrava HPP telemetric equipment for monitoring water volumes for the gasket cooling system was installed
- In Dubrava HPP the facility for waterflow protection from pollution at the discharge canal was constructed. The facility consists of the floating dams, floating dam anchorage, access stairs, busbars, floating dam storage and the suspension service walking bridge over the discharge canal. The purpose of this facility is to protect waterflows from pollution at the discharge canal and improve life conditions for local population downstream from Dubrava HPP.
- In hydro generation area North, project documentation was compiled and reconstruction of the filtering facility agreed for protecting against invasive bivalves.
- Environmental protection programmes for testing water tightness of pipes and oil sumps in 110/x kV and 35/X kV, under jurisdiction of HEP DSO, were made and carried out for the most part.
- Water tightness was tested at several HEP DSO locations. If it was required, the recovery was conducted or the environmental programme for sewage tank improvement developed. Separators for process water purification were installed at several restaurants, car washing premises or other facilities.
- Oil sewage and oil separators were installed at the site of several transformer stations and transformer storages.
- Emergency measures operating plans were developed in case of a sudden water pollution at 110/X kV and 35/X kv TS, storages or transformer workshops.
- Rules of operation and maintenance of wastewater discharge facilities at 110/X kV and 35/X kV TS sites were made.

### WASTE MANAGEMENT AND SOIL PROTECTION

- In hydro generation area North three new 1,100 l containers were purchased for waste separation as well as absorption aids for oil pollution rehabilitation and chemical resistant cupboards for keeping equipment and hazardous chemical protection aids.

### ENVIRONMENTAL PROTECTION

- Protection of natural fish spawning sites within the HPP system is conducted by regulating the water levels during the spawning period considering the hydrology on the upstream part of the Drava river i.e. its flow from Slovenia. Subsidizing fish stocking (in line with the fish stocking plan of sport fishing clubs) and other forms of cooperation with the County Association of sport and fishing clubs is a protection measure prescribed by the environmental impact assessment studies. Stocking 1.73 ton of fish was subsidized. In line with the studies, monitoring of the ichthyologic accumulation water condition is conducted including drainage canals and the part of the old flow of the river Drava. Data is analysed and processed by the Faculty of Science Zagreb.
- Under the Agreement on the cooperation in conducting protection measures of the protected white stork (*Ciconia Ciconia*), concluded between the Ministry of Culture and HEP, HEP DSO constantly conducts measures for white stork protection. Special care is taken in activities conducted on sites occupied by the stork, the condition of the stork nest frame is monitored, they are repaired or replaced and stork nest moves as required (during 2012 about 70 of above described activities were conducted).

- Activities relating to bird protection against the electric shock on MV lines were conducted, primarily on the island of Cres where 40 odd pillars were insulated to eliminate the most critical positions where griffon vultures were hurt by an electric shock. Activities were conducted in the cooperation with the 'Caput Insulae' ecological association and a senior environmental inspector.
- In the area around Perušić a wide operation was conducted to eliminate the danger of hurting the common buzzard. Based on the inspection findings and the order by the environmental inspector, the 10 kV line from 35/10 kV Perušić TS to TS 10/0.4 kV Konjsko Brdo TS was insulated.

#### OTHER

- Following the public consultation conducted in 2011, in June 2012 the Advisory Committee gave a positive opinion on the environmental impact assessment of the Plomin TPP reconstruction – the replacement of the existing TPP Plomin 1 for the purpose of modernization and capacity increase (TPP Plomin C). In line with the The Convention on Environmental Impact Assessment in a Transboundary Context (the ESPOO Convention), Slovenia also submitted a positive opinion on the environmental impact. In September 2012, the Ministry of Environment and Nature Protection issued the Decision on the integrated environmental requirements for Plomin TPP C.
- Having considered the fact of changed environmental regulation compared to the period of issuing the Decision on environmental impact assessment for Ombla HPP, HEP has repeated research on the Ombla area and contracted additional expert documentation which has resulted in the Biodiversity Management Plan for Ombla HPP area and the environmental impact assessment for the ecological network. Conducted research resulted in new environmental and nature protection measures, which were presented to public in March 2013.
- The public consultation on the Environmental Impact Assessment Study for connecting Sisak TPP to 220 kV overhead line Mraclin-Prijedor was conducted. The Ministry of Environment and Nature Protection issued the Decision on environmental impact assessment.
- In TE-TO Zagreb, Sisak TPP, TE-TO Osijek and hydro generation area North operation plans for protection and rescue were made as well as projections of population vulnerability, vulnerability of fixed assets and cultural heritage, environment in case of disasters and large accidents.

#### CERTIFICATION

- In line with the Decision made by the Management Board of HEP d.d., the certification procedure according to ISO 9001 will be conducted in all HEP d.d. departments. Preparations for the selection of the consultants for drafting documentation required for the certification procedure has been carried out.
- In line with the Decision made by the Managing Director of HEP Generation d.o.o. (of 27 August 2012), the Team for the coordination of setting up the integrated system for environmental management according to ISO 14001 and the system for quality management according to ISO 9001 in Rijeka TPP, Osijek TPP, Plomin TPP, hydro generation area South and Dubrovnik HPP was appointed. In late 2012 first activities started by analysing the state of affairs in Rijeka TPP, Osijek TE-TO and Plomin TPP. Certification of this plants is expected until end 2013.
- In the facilities with established quality and environment management systems according to ISO 14001 and ISO 9001, independent certification companies conducted the control audit. The quality and management system recertification was conducted in TE-TO Zagreb, Sisak TPP, EL-TO Zagreb, KTE Jertovec, hydro generation areas North and West.
- HEP Generation HPP confirmed their green certificates for electricity generation from RES for 2011.
- HEP DSO established the environment management system according to ISO 14001:2004. Certification audit was conducted in December 2012. The certification company acknowledged the environment management system in line with the requirements set by ISO 14001:2004.
- By establishing the environment management system, HEP DSO has set up quality waste management, quality storage and use of chemicals, implementation of risk mitigation measures in all its organizational units. Procedures in case of extraordinary events and measures for air, soil, water and employee health are defined.