



Waste and Chemicals in Azerbaijan

A Visual Synthesis

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This publication is based on official country information submitted to the Basel Convention, Stockholm Convention, Rotterdam Convention, Montreal Protocol, state of the environment reports, scientific papers and news reports.



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The publication aims to catalyse remedial action on environmental legacies and responsible approaches to waste and chemical management by sharing information and improving public awareness of situations and trends in relation to waste and chemicals, the main areas of concern and notable responses.

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Foreword

A rapidly growing economy and a good quality of life are indicative of the progress Azerbaijan has made in recent years. The country was once the leading producer of pesticides for the Soviet economy and its agricultural sector used chemicals extensively. Azerbaijan was also once a key producer of air conditioners, compressors and refrigerators that relied on ozone-depleting substances. The country was best known for its oil production and the associated pollution of land and the shores of the Caspian Sea.

Political attention and the wealth accumulated from oil and gas income over the past decade have enabled Azerbaijan to tackle the pollution problems of the past and pave the way for sound waste and chemical management in the present and future. The clean-up effort has been underway for some time, however, in September 2006, a Presidential Decree launched the Environment State Program of Azerbaijan, which established a comprehensive plan for clean-up and remediation, improvement of hazardous and non-hazardous waste management, and the upgrading of environmental laws, regulations and institutions. Azerbaijan declared 2010 as the “Year of the Environment”, further advancing countrywide environmental measures and awareness. Over the past five to seven years the results of this programme have become visible, prompting returning visitors to remark on the “new” Azerbaijan. Many countries have developed environmental action plans and programmes over the same period, however not many have actually invested in environmental improvements and the implementation of planned actions. Hence, Azerbaijan is justifiably proud of its achievements.

For Switzerland the sustainable management of waste and chemicals is a key priority not only at national and regional levels, but also internationally. Switzerland is host to the main international institutions and conventions relating to chemical and waste management, has an important international chemicals industry, and is prominent in related research. Based on this expertise and responsibility, Switzerland has been assisting Azerbaijan and the countries of Central Asia in the development of national chemical profiles and environmental performance reviews, and by demonstrating hazardous waste management approaches and mercury risk reduction measures.

Further enhancing the cooperation and coordination among all relevant actors in the sustainable management of chemicals and waste is another key priority for Switzerland. Hence we look forward to improved synergies between the international, regional and national instruments in the implementation and further development of all relevant instruments and processes, including the four chemical and waste-related international agreements (Basel, Rotterdam, Stockholm and Minamata Conventions), and the Strategic Approach to International Chemicals Management.

Switzerland, Azerbaijan and the five Central Asia countries are all members of the same Global Environment Facility constituency, and, with its history of assistance to Central Asia and Azerbaijan on waste and chemical management issues, Switzerland supports this publication to promote the exchange of experience between Azerbaijan and the countries of Central Asia. In particular, Azerbaijan's successes may provide a model for Central Asia in the clean-up of waste and chemicals and the exchange of experience may help to strengthen cooperation between Azerbaijan and the countries of Central Asia.

Bern and Geneva

29 November 2013

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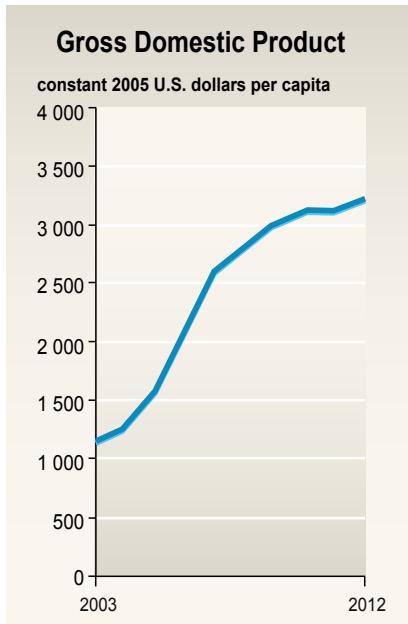
Director
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Introduction

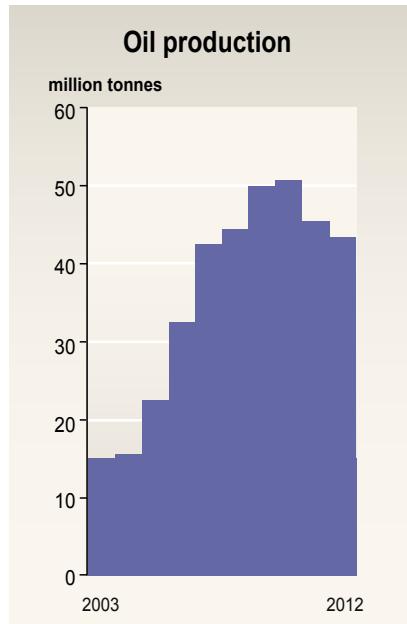
While Azerbaijan and Central Asia share no common land borders, they are separated – and united – by the Caspian Sea, an historical trade route between the Caucasus and Central Asia. The countries also share a Soviet history with some of the features and legacies of Soviet industrialization.

The Republic of Azerbaijan has a land area of 86 600 km², roughly two times that of Switzerland, and half of its territory is mountainous: a few summits of the Caucasus Mountains exceed 4 000 metres. Azerbaijan borders Russia, Iran, Turkey, Armenia and Georgia and shares its marine borders

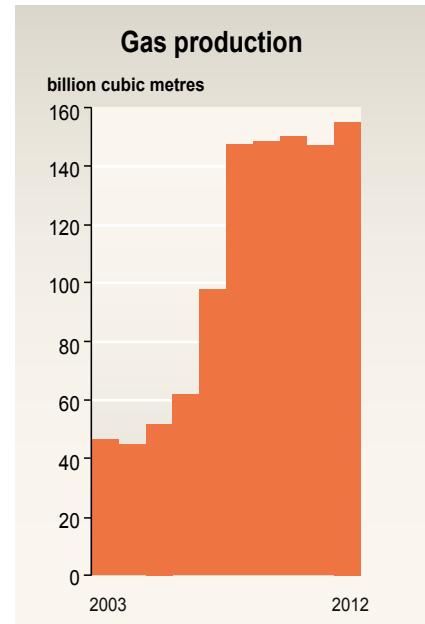
in the Caspian with Kazakhstan and Turkmenistan. The population of Azerbaijan is 9.5 million people. The average population density is about 110 persons per km² and about half of the population is rural. The greater Baku area is the most densely populated – an estimated 3.5 million residents and density of almost 1 000 persons per km². The construction and launch of the Baku-Tbilisi-Ceyhan pipeline in 2005 gave Azerbaijan access to Mediterranean and global oil and gas markets, and a sharp increase in oil and gas production has been a major factor in fostering economic growth. With the economic boom, the percentage of people living in poverty declined from 45 to less than 10.



Source: World Bank development indicators



Source: BP Statistical Review of World Energy 2013



Source: BP Statistical Review of World Energy 2013



When the Kura and Aras rivers, the two main sources of water for drinking and irrigation, enter Azerbaijan from neighbouring countries, they are already contaminated by municipal and industrial wastewater. This and other water quality and water security issues are Azerbaijan's environmental priorities, as is sound waste and chemical management. Through the Global Environment Facility (GEF) and other global and regional environmental agreements, Switzerland has promoted cooperation between the regions on opposite coasts of the Caspian Sea for many years.



Waste and chemical issues in Azerbaijan

Sites with significant amounts of industrial waste and chemicals

-  Notorious historical pollution from industrial development
-  Other industrial waste and chemical issues raising public concern

Improvements in waste and chemical management

-  New hazardous waste disposal facilities
-  Ongoing and planned clean-up actions or waste reduction initiatives

Sites with significant amounts of persistent organic pollutants

-  Major stores and dumps of obsolete pesticides recognized as hotspots
-  Other disposal sites for agricultural chemicals
-  PCB-contaminated sites

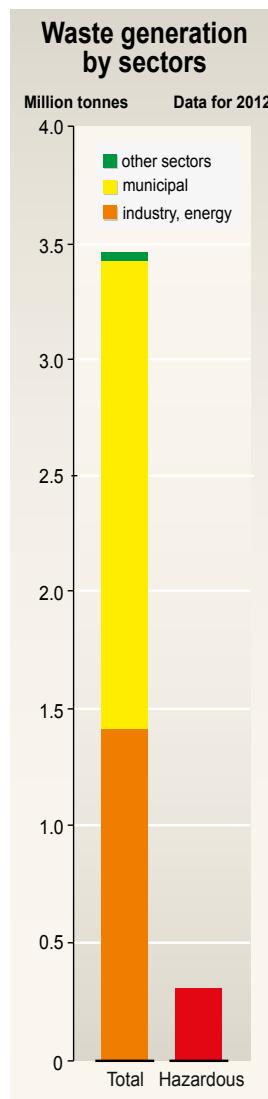
-  Polluted rivers
-  Polluted water areas in the Caspian Sea

Country profile: The management of waste and chemicals in Azerbaijan

Azerbaijan is one of the oldest oil-producing nations in the world and during the Soviet era became one of the largest manufacturers of agricultural chemicals, producing almost half a million tonnes of dichlorodiphenyltrichloroethane (DDT) and other pesticides. The country was a large consumer of ozone-depleting substances for air-cooling equipment and refrigerators and its chlor-alkali industry used mercury in its processing. By the end of the Soviet era, the areas around Baku, the capital city, had become pollution hotspots. Historically, three quarters of the country's industrial production and municipal waste generation occurred on the Absheron Peninsula where Baku and many industries are located. This pattern continues today.

During the transition to independence, Azerbaijan's economic profile began to change and most industrial uses of hazardous chemicals were reduced or stopped. No remediation occurred, however in recent years, the country has demonstrated a strong political will and has accumulated the resources necessary to clean up the legacy pollution. International donors also responded to these positive trends and provided financial and technical support.

Azerbaijan now enjoys improved environmental safety in the areas of oil extraction and transportation and in the chemical industry. The Soviet practices of managing municipal waste and of discharging communal and industrial wastewater to the Caspian Sea are being replaced by new waste management systems that limit waste generation, sort waste by types, and improve recycling efficiency and storage safety. Water supply, sanitation and wastewater treatment systems are being upgraded in several urban centres. These improvements not only help to improve environmental quality, they also reduce greenhouse gas emissions and improve energy efficiency and recovery in the management of waste.



Source: Statistics of Azerbaijan 2012

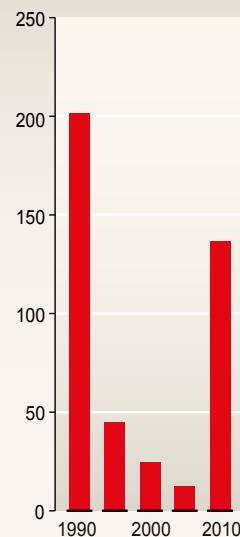
Municipal solid waste composition* (%)

* Average for Baku
Data for 2008

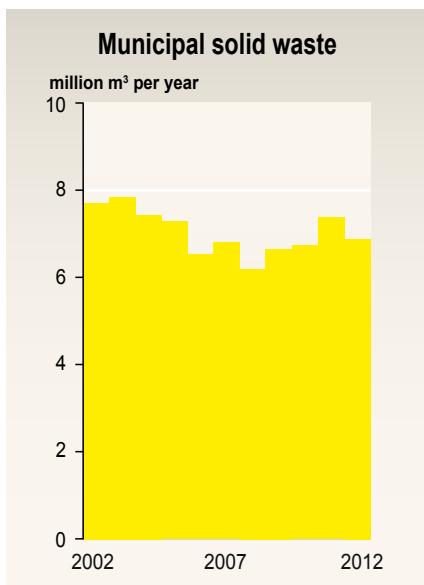


Hazardous waste

Thousand tonnes



Sources: Azerbaijan National Environmental Action Plan (1998), UNECE environmental indicators (2013)



Source: Statistics of Azerbaijan (2013)

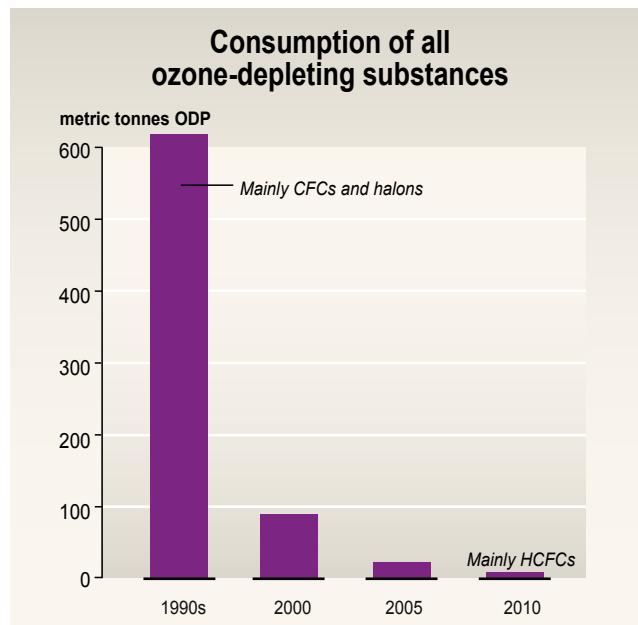
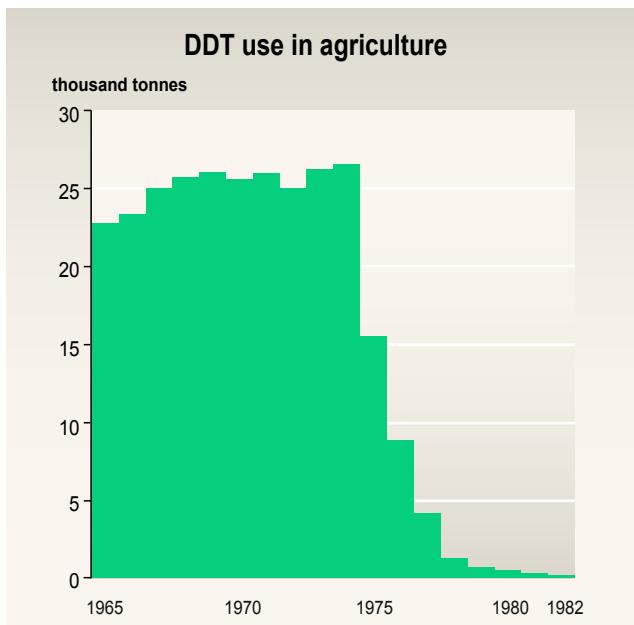
There are about 70 landfills in Azerbaijan. Four of them – all located in the greater Baku area – receive over 70 per cent of the country's total (2 million tonnes per year) municipal solid waste. The largest site, Balakhani, occupies an area of 200 ha. Population growth and an improving quality of life in Azerbaijan are driving up waste generation, particularly in the Baku area. Current initiatives in the area of waste management are contributing to the decoupling of this trend.

As a result of the restructuring of the Azerbaijan economy, the country generates less industrial waste than municipal solid waste per year. In addition, more than half of the industrial waste generated in the country is reused or recycled.

The country's generation of hazardous waste has declined, both relative to GDP and in absolute terms. By the end of the Soviet era, Azerbaijan had accumulated over three million tonnes of hazardous waste, however, in the transition to independence, many of the industries using or producing hazardous substances shrank. The generation of hazardous waste has declined. In the past decade, with Azerbaijan's GDP going up and waste generation going down, the country now displays one of the lowest ratios (1–10 kg/USD 1 000) of hazardous waste to GDP in the region. Azerbaijan has also introduced new laws and regulations on hazardous waste and is reporting to the Basel Convention.

Poor wastewater treatment is another problem. Only a small percentage of the total volume of wastewater generated in the country undergoes mechanical treatment and even less receives biological treatment. These shortcomings affect inland water quality and, eventually, the Caspian Sea.

Like the republics of Central Asia, during the Soviet era Azerbaijan relied heavily on pesticides and other agricultural chemicals to boost production. Previous levels of pesticide application exceeded 15 kg–20 kg per hectare of cotton and were repeated several times in some districts. One legacy of that reliance and excessive use in Azerbaijan is 8000 tonnes of abandoned and obsolete toxic agrochemicals, about half of which is DDT, a notorious persistent organic pollutant. Chemical use in agriculture has declined, however the clean-up of legacy waste has not yet been fully resolved, although inventories are complete, remediation plans are in place and initial urgent measures are being implemented. The safe disposal or destruction of nearly 400 tonnes of liquid pesticides presents a particular challenge: the country has no appropriate facilities.



The contaminated waste in the electricity network includes an estimated 196 tonnes of oils containing polychlorinated biphenyls (PCBs) and 384 tonnes of PCB-containing equipment. The National Implementation Plan for the Stockholm Convention considers the possibility of replacing and destroying PCB-contaminated materials.

Some of the chemical industries on the Absheron Peninsula are no longer in operation and others have modified their practices. Mercury, for example, is no longer used in industrial processes and historical mercury pollution has been cleaned up. These and other actions in relation to waste and chemicals are part of the ambitious two-phase Action Plan for Improving the Environmental Situation in Azerbaijan for 2006–2010 and 2011–2014.

A general lack of efficient institutional arrangements in the past contributed to Azerbaijan's continuing non-compliance with the requirements of the Montreal Protocol from 2001 through 2005. With the strengthening and restructuring of institutional responsibilities, Azerbaijan reported zero chlorofluorocarbon (CFC) consumption in 2006. Since then, however, the institutional capacity related to the monitoring and control of ozone-depleting substances (ODS) has not been sufficient to control ODS effectively. The Global Environment Facility is now supporting Azerbaijan in improving the effectiveness of the registration, communication and control of ODS and the operating practices of the responsible institutions and users.

International instruments for sound chemical and waste management

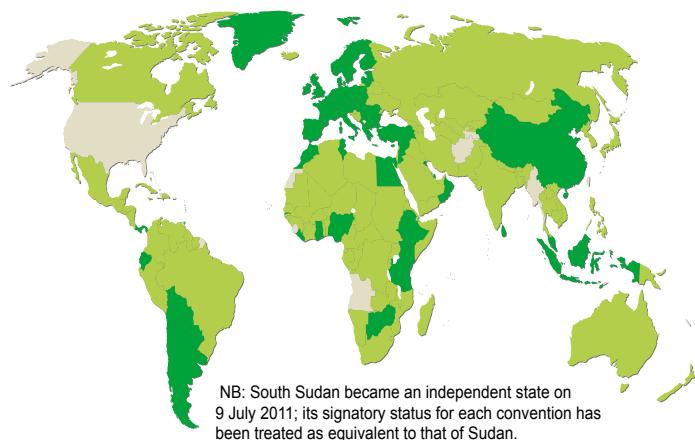
Azerbaijan is party to a number of multilateral and regional agreements and instruments which address the sound management of hazardous chemicals and waste and integrates international best practice and requirements into its national policies and regulations.

The Strategic Approach to International Chemicals Management (SAICM) was developed by the International Conference on Chemicals Management – a multi-stakeholder and multi-sectoral preparatory committee – and was adopted in February 2006 in Dubai, United Arab Emirates. It is a policy framework to help achieve the goal agreed at the 2002 Johannesburg World Summit on Sustainable Development of ensuring that, by the year 2020, chemicals are produced and used in ways that minimize significant adverse impacts on the environment and human health. Azerbaijan has nominated a SAICM focal point and participates in the related international meetings and processes.

The United Nations Environment Programme Governing Council agreed to prepare a global treaty on mercury to protect human health and the environment in 2009. The treaty – called the Minamata Convention after a city in Japan where serious health damage occurred as a result of mercury pollution in the mid-20th century – specifies controls and reductions across a range of products, processes and industries, in which mercury is used, released or emitted. These range from medical equipment, such as

thermometer and energy-saving light bulbs, to the mining, cement and coal-fired power sectors. The treaty also addresses the direct mining of mercury, the export and import of the heavy metal, and the safe storage of mercury waste. The Minamata Convention was opened for signature at the diplomatic Conference in Japan in October 2013. Azerbaijan participated in sessions of the intergovernmental negotiations committee and is encouraged to join this global mercury agreement.

The Globally Harmonized System of Classification and Labelling of Chemicals (GHS) is an internationally agreed tool for chemical hazard communication which incorporates harmonized chemical hazard classification criteria and provisions for standardized labels and safety data sheets. It was developed in follow-up to the 1992 Rio Summit and was adopted in 2002 by the United Nations Economic and Social Council (ECOSOC) Subcommittee of Experts on the GHS (SCEGHS). The World Summit on Sustainable Development (WSSD) endorsed a global GHS implementation target of 2008. The United Nations Institute for Training and Research (UNITAR) and the International Labour Organization (ILO) were nominated as focal points for assisting countries in building their capacity to implement the GHS. It is an important new tool which countries can use as a basis for establishing comprehensive national chemical safety programs. Azerbaijan actively implements the GHS.



Basel Convention [1989] on the Control of Transboundary Movements of Hazardous Wastes and their Disposal

- 180 Parties
- 75 Parties having ratified both
the Convention and the BAN amendment [1994]¹

¹ - Ban on the export from OECD to non-OECD countries of hazardous wastes intended for final disposal [1994], recovery or recycling [1997].

The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal was adopted in 1989 and entered into force in 1992. The overarching objective of the convention is to protect human health and the environment against the adverse effects of hazardous wastes. Three additional objectives are: to minimize hazardous waste generation (both in quantity and danger); to treat and dispose of hazardous and other wastes as close as possible to their source of generation in an environmentally sound manner; and to reduce transboundary movements of hazardous and other wastes to the lowest level consistent with their environmentally sound management. The Basel Convention has 180 parties, of which 75 have ratified both the convention and the BAN Amendment, which covers exports of hazardous wastes intended for final disposal, recovery or recycling from member countries of the Organisation for Economic Cooperation and Development (OECD) countries to non-OECD countries. Azerbaijan joined the Basel Convention in 2001 and since then has upgraded its laws on hazardous waste, introduced a new waste classification system and regulations in line with the convention, and built a national hazardous waste management centre.



The Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (adopted in 1998, entered into force in 2004) has 153 parties and focuses on facilitating information exchange about hazardous chemicals by providing for a national decision-making process on their import and export and by disseminating these decisions to the parties. While Azerbaijan is not yet a party to the Rotterdam Convention, the country may benefit from its provisions and is encouraged to join it.



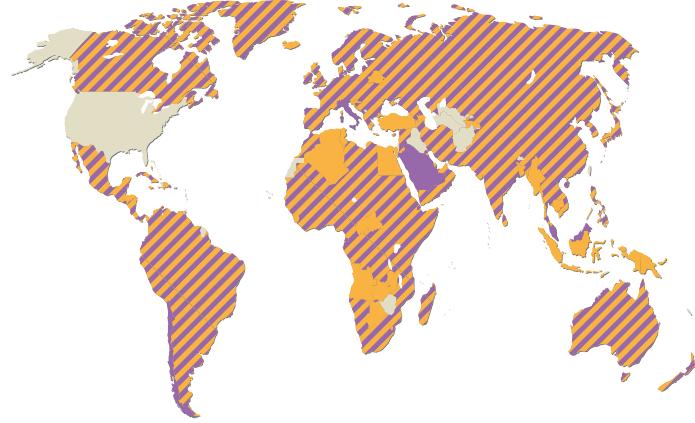
The Stockholm Convention on Persistent Organic Pollutants was adopted in 2001 and entered into force in 2004. It lists 22 chemicals for which consumption, production and use, import and export, disposal and/or environmental release should be reduced, prohibited and/or eliminated. Persistent organic pollutants (POPs) are chemicals that persist in the environment, bioaccumulate through the food web, and pose a risk of causing adverse effects to human health and the environment. Some can be transported over long distances by wind and water. The Stockholm Convention has 179 parties. Azerbaijan acceded to the Stockholm Convention in 2004 and compiled its National Implementation Plan. Azerbaijan's achievements under the Stockholm Convention include the improved environmental safety of the Jangi site – a major obsolete pesticides landfill in the country – and political and technical decisions on improved pesticides management.



The Montreal Protocol on Substances that Deplete the Ozone Layer (a protocol of the Vienna Convention for the Protection of the Ozone Layer) is designed to protect the Earth's protective layer of ozone by phasing out the production and consumption of substances believed to be responsible for ozone depletion. The treaty was agreed in 1987, entered into force on 1 January 1989 and has undergone seven revisions. On the 25th anniversary of the signing of the treaty in 2012, scientists confirmed their belief that compliance with the treaty by a majority of countries has stabilized the ozone layer and that the potentially catastrophic growth of the ozone hole has stopped. They expect the ozone layer to recover by the second half of the 21st century – several decades later than originally hoped – provided the provisions of the treaty are fulfilled.



Azerbaijan ratified the Montreal Protocol in 1996. Since then the country has introduced regulations on the import and export of ozone-depleting substances and has phased out CFC use by its industries. With GEF support, Azerbaijan is phasing out hydrochlorofluorocarbons (HCFCs) and promoting the production of HCFC-free, energy-efficient refrigerators and air-conditioning systems.



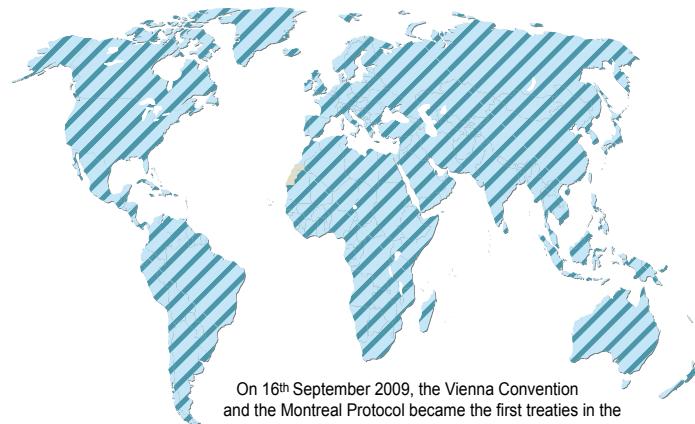
Rotterdam Convention [1998]
 on the Prior Informed Consent Procedure
 for Certain Hazardous Chemicals and Pesticides
 in International Trade

■ 153 Parties

Stockholm Convention [2001]
 on Persistent Organic Pollutants

■ 179 Parties

■ Parties having ratified both Rotterdam
 and Stockholm Conventions



Vienna Convention [1988]
 for the Protection of the Ozone Layer

■ 197 Parties

Montreal protocol [1989]
 on Substances that Deplete the Ozone Layer

■ 197 Parties

On 16th September 2009, the Vienna Convention
 and the Montreal Protocol became the first treaties in the
 history of the United Nations to achieve universal ratification.

Collaboration and experience exchange with Central Asia

The Framework Convention for the Protection of the Marine Environment of the Caspian Sea was signed on 4 November 2003 in Tehran. The five Caspian countries, including Kazakhstan and Turkmenistan – Azerbaijan’s Central Asia neighbours – are members. The Convention’s objectives are to protect the Caspian Sea environment from pollution and to promote the protection, restoration and rational use of the Caspian Sea ecosystem. The protocol concerning regional preparedness, response and cooperation in oil pollution incidents was signed in 2011 and the protocol on land-based sources of pollution was signed in December 2012. International and state oil companies in Azerbaijan are cooperating to ensure that the Caspian Sea and its shores are safe from pollution and that collaboration with the neighbouring states covering industrial emergency drills, safety of operations and environmental monitoring is ongoing.

The combination of rapid economic growth and Azerbaijan’s decision to make cleaning-up a top political priority created the right conditions for implementing urgent safety measures at the major pesticide dumps inherited from

the Soviet era. Azerbaijan produced a significant political declaration on the urgency of the obsolete pesticides problem and discussed collaborative steps to be taken to solve this problem. The forum provided key inputs to the 7th Pan-European Ministerial Conference “Environment for Europe” held later that year in Astana, Kazakhstan.

As a member of the United Nations Economic Commission for Europe (UNECE), Azerbaijan participates in its various conventions and processes related to sound waste and chemical management and environmental governance. The UNECE environmental performance reviews, which are supported financially by Switzerland, help Azerbaijan and the countries of Central Asia to consider their current situation and reflect independently on drawbacks and advances. These reviews also encourage the countries to take steps to improve performance. During UNECE meetings, for example the Joint Task Force on environmental monitoring and indicators, delegates from Azerbaijan and Central Asia often work together and find many common areas for the exchange of experience. Common indicators and definitions on waste are a high priority.

Success stories

Azerbaijan's successes in environmental clean-up and in sound chemical and waste management provide numerous examples for others to follow. The clean-up of the Absheron Peninsula – an area with high concentrations of both pollution and people – is a special case. Azerbaijan's key achievements here include the construction of a new national hazardous waste management site and the oil industry's modern hazardous waste sites. The country has made significant improvements in the Hovsan wastewater treatment facilities and in the Balakhani solid municipal waste landfill, thereby addressing the problems associated with historical oil, mercury, persistent organic pollutants and ozone-depleting substances. The country is also developing a national solid municipal waste strategy that will apply the experience gained in the Absheron Peninsula to other parts of the country. Other types of waste will be covered by specific strategies.

Absheron Peninsula environmental clean-up and improvements

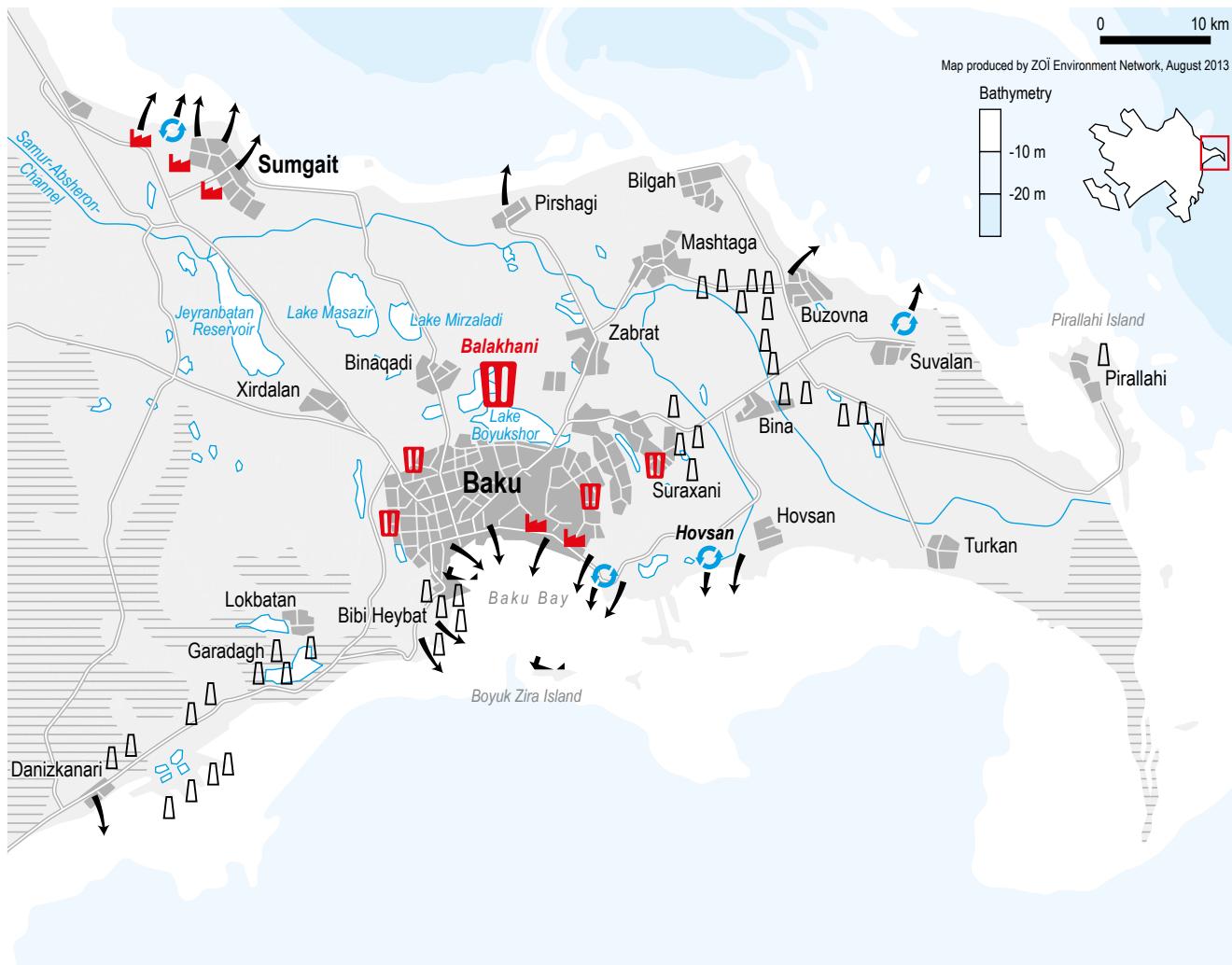
In the last ten years the World Bank has financed several projects that aim to improve the environment in the Absheron Peninsula. The total financing from donors exceeds USD 200 million (including new funding) and is being supplemented by governmental co-financing. In addition, private sector actors – such as oil companies – have invested in waste minimization, clean-up and recycling programmes. These projects are helping to rehabilitate land polluted by the legacy of onshore oil production on Absheron, to reduce environmental pressure from today's oil and gas extraction, to dispose of hazardous industrial waste from defunct enterprises safely, and to improve urban solid and liquid waste management in the Baku metropolitan area.

An estimated 10000 ha on the Absheron Peninsula and surrounding areas are affected by oil and chemicals and the

contamination of about 2000 ha polluted during Soviet-era oil production is a notorious legacy that required priority clean-up. Mechanical methods are used for the clean-up of highly polluted soil, while bioremediation is used for less polluted soil. Between 2009 and 2011, over 800 ha were remediated using one or the other of these methods, notably at the Bibi Heybat and Binaqadi oil extraction and storage areas close to Baku. Once a pollution hotspot, the area is now a park. The large-scale clean-up of the Baku Bay targeting sunk vessels and obsolete infrastructure resulted in removal of more than 4500 tonnes of scrap metal and 500 tonnes of other waste from the seashore and seabed.

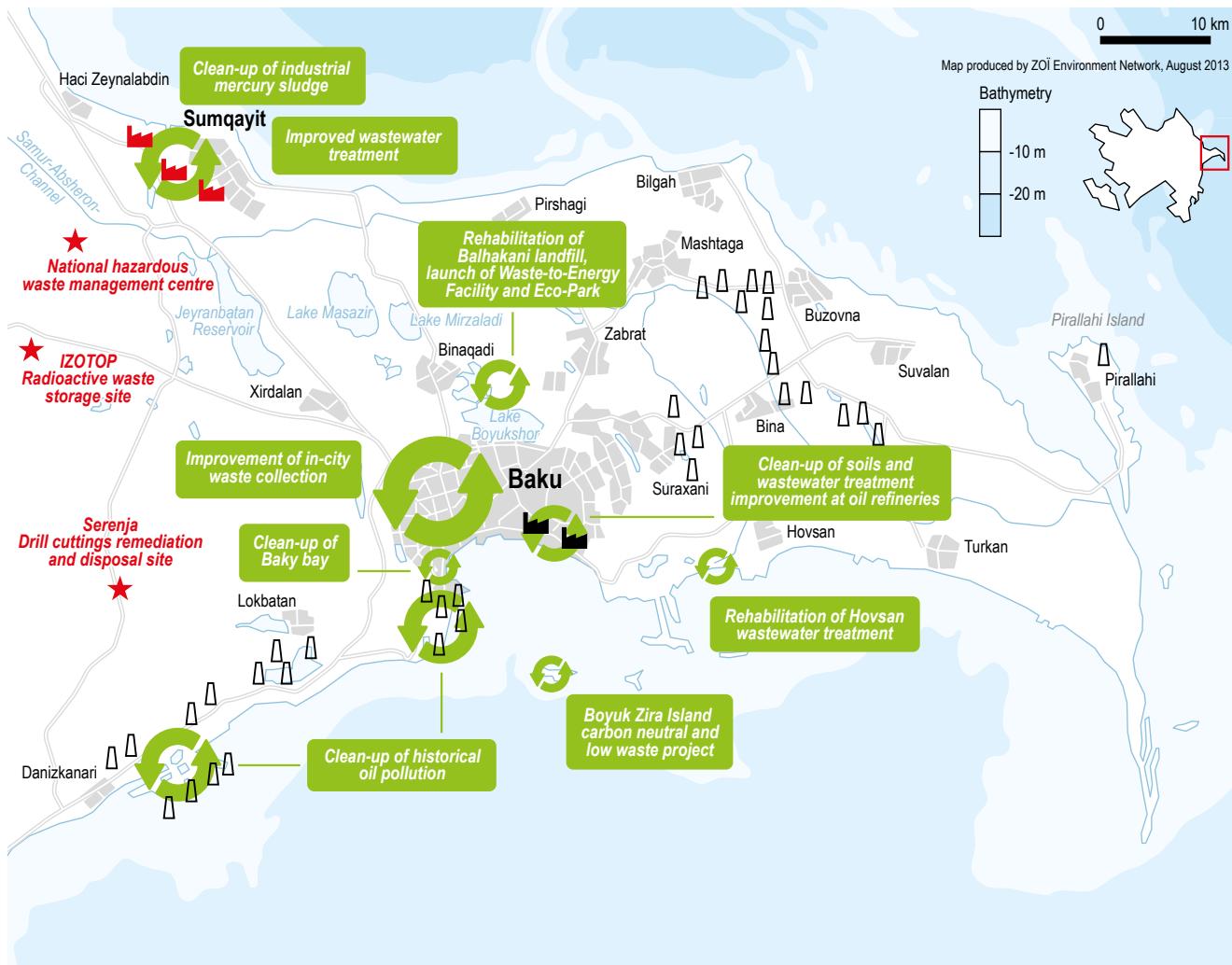
The State Oil Company of the Azerbaijan Republic (SOCAR) has accepted responsibility for past oil pollution in other parts of the country and is scaling up the clean-up efforts, setting priorities on the basis of the economic potential of the polluted areas. The Baku and Azerneftiyag refineries' wastewater facilities have been upgraded and nearly 35 million tonnes of oil-contaminated soils and sludge have been reprocessed. Both refineries are likely to be moved out of densely populated areas to minimize environmental and industrial impacts.

Part of the Absheron rehabilitation programme includes a low-level radioactive waste disposal project that helps to reduce health risks by lowering the population's exposure to the radioactive contamination resulting from oil extraction and iodine production. The planned decontamination of former iodine production plants will involve the removal, repackaging and transport of contaminated low-level radioactive waste and the disposal of this material at an upgraded radioactive waste storage facility "Izotop", which currently handles radioactive waste generated by medical, research and industrial applications. A survey programme has mapped the sites of low- and medium-level radioactive contamination in the country and has helped to determine priorities for remediation or containment.



Absheron peninsula: situation 20 years ago

-  Notorious historical pollution from industrial development
-  Poorly managed municipal waste landfills
-  Municipal and industrial discharge sources
-  Sparsely populated areas
-  Major wastewater treatment plants: low efficiency of water cleaning
-  Shipwrecks
-  Oil fields with soil and water pollution



Absheron peninsula: present situation

-  Notorious historical pollution from industrial development
-  Other industrial waste and chemical issues raising public concern
-  Poorly managed waste collection or landfill practices
-  Municipal and industrial discharge sources
-  Oil wells



Balakhani Waste-to-Energy Facility and Sorting Plant



Clean-up action, Absheron Peninsula

The Absheron Environmental Programme also created the Tamiz Shahar (Clean City) Joint Stock Company, which is responsible for the transport, sorting and disposal of municipal waste from the Baku metropolitan area. Tamiz Shahar started its activities with public campaigns, then improved the waste management system and upgraded the Balakhani disposal site, which was selected as the central site for urban waste disposal for Baku and, in the long run, for the entire Absheron Peninsula. Tamiz Shahar is working to control the environmental impact of waste and to increase the efficiency of an existing landfill by installing up-to-date equipment and technology such as weighbridges, bulldozers and waste-sorting machines.

The separation and recycling of municipal solid waste by citizens is not yet common but business is improving its practices for paper, plastic and metal waste. The rehabilitation of the Balakhani disposal site led to the elimination of the fires that often blanketed Baku and its surroundings. Waste is now covered and fenced and incoming vehicles are controlled and monitored. As part of the project numerous informal smaller waste dumps in and around Baku were closed and the sites cleaned up.

The government of Azerbaijan has invested USD 350 million in a Waste-to-Energy Facility and a Sorting Plant located next to the Balakhani landfill. The government's medium- to long-term strategy is to develop the Balakhani site as an eco-industrial park hosting numerous recycling and green energy industries, including the principal recycling, recovery and waste management centre for greater Baku.

A project area of 120 ha at the Balakhani landfill will be rehabilitated and designed for long-term disposal of waste from the greater Baku region for the next 20 years at least. A highly efficient methane gas capture system will also be installed at the landfill. The system will generate revenues from sales of 91 000 MWh of electricity and reduce greenhouse gas emissions by 670 000 tonnes of CO₂-equivalent over a period of ten years.

The Balakhani eco-industrial park currently consists of the Material Recovery Facility, with a capacity of 200 000

tonnes per year, and the Waste-to-Energy Plant, with the capacity to generate 230 million kWh of power from 500 000 tonnes of waste per year. Both facilities operate in compliance with European Union and Azerbaijani environmental requirements. The Waste-to-Energy Facility at Balakhani was completed in 2012 and its pilot phase of operation commenced in 2013. The facility includes an incinerator designed to handle 10 000 tonnes of medical waste per year. Industries specialising in recycling plastics, rubber and tyres, lead batteries, mercury-containing equipment, electronic waste and other materials are welcome at the eco-industrial park, which is by far the largest project of its kind not only in Azerbaijan, but also in the Caucasus and Central Asia.

Sumgait chemical industry legacy and recent initiatives

With a population of 310 000, Sumgait is the third largest city in Azerbaijan and lies 30 km north of Baku. It was once the industrial hub of chemical and metal production and equipment manufacturing in the Soviet Union and had a dozen industrial plants and factories employing thousands of workers, who were housed just a few kilometres from these enterprises. Industrial facilities occupy up to one third of the city area. Ten years after the end of the Soviet Union, more than half of the population had some form of chemical-related illness. Children were particularly sensitive to the environmental stress.

The most critical problem – mercury sludge from chlor-alkali production – was solved by the development of the national hazardous waste management site built with financing from the World Bank in full compliance with European Union regulations. The landfill, which has been in operation since 2004, has a capacity of 250 000 cubic metres; over 40 000 cubic metres have already been used for the disposal of mercury soil and sludge, a major operation that was conducted in 2009. The remaining space is available for commercial waste disposal. Təhlükəli Tullantıların (Hazardous Waste) LTD, which was established by the Ministry of Ecology and Natural Resources, operates the national hazardous waste management site in the best manner possible.



Balakhani landfill before...



...and after rehabilitation



Modern hazardous waste disposal site



Abandoned obsolete pesticides in neglected storage conditions



Improved storage facility for obsolete pesticides at Jangi



Sumgait continues to harbour a number of industrial pollution hotspots. However, encouragement may be drawn from the closure of many of its hazardous industries and from some positive clean-up measures that have been successfully completed.

Industrial and municipal wastewater treatment and the Caspian Sea

Drill cuttings – the broken bits of solid material removed from boreholes – are a type of waste generated by oil companies. Some drill cuttings are a non-toxic mixture of crushed rock and water-based drilling fluids and are discharged to the Caspian Sea. However, the drill cuttings that are mixed with potentially toxic synthetic mud are either re-injected into geological formations offshore or shipped to shore for thermal treatment and disposal. Specialized oil industry hazardous waste facilities process more than 35 000 tonnes of potentially toxic drill cuttings from offshore oil exploration and extraction annually. Azerbaijan's state oil company SOCAR and British Petroleum recently agreed to build a larger waste recycling centre (at an estimated cost of USD 60 million) in the Garadagh area, near Baku, for processing oil waste and drill cuttings from both companies. This collaboration is an encouraging indicator of the improved protection of the Caspian Sea ecosystem and creates local capacities and employment in industrial wastewater management.

Hovsan, the largest municipal wastewater treatment plant in Azerbaijan, currently processes 60 per cent of Baku's wastewater volume. The coastal area around Baku is heavily populated and is home to many businesses, residences and commercial premises. It is also used for swimming, hence maintaining good water quality is paramount. From 2007 to 2009 the government of Azerbaijan invested in a major rehabilitation of the Hovsan wastewater treatment plant. As a result, its annual wastewater processing capacity increased from 480 000 to 640 000 cubic metres and biological wastewater treatment was substantially upgraded. Processed wastewater is discharged into the Caspian Sea near the Hovsan plant. As a next step, experts recommend

the installation of an approximately 10-km-long sewage effluent outfall at the Hovsan wastewater plant. The outfall would increase the dilution and dispersal of the sewage and cause the bacteria in the wastewater to die off more quickly. The project would reduce bacterial concentrations and further alleviate pollution in the Caspian, however at an estimated USD 100 million, the costs involved are high.

Sumgait recently improved its water supply and sewerage system, thereby increasing capacity of wastewater processing from 30 000 to 40 000 cubic metres; the construction of a larger wastewater collector is ongoing. Almost 20 smaller wastewater treatment plants were built over 100 km of coastline in the northern part of the peninsula but much work remains to be done to ensure efficient wastewater treatment, both on Absheron and in other parts of the country.

Persistent organic pollutants: Pesticides and PCBs

The Sumgait Surfactants Plant produced DDT for applications in local and regional agriculture, particularly in cotton plantations and vineyards from 1958 to 1980. Cumulative production exceeded 480 000 tonnes of pesticide mixtures, and the industrial site is now contaminated with leftovers and local spills. Estimates of obsolete pesticides left in 80 locations across the country vary but the amount probably exceeds 8 000 tonnes. The central facility for obsolete pesticides storage at Jangi contains about half of this amount. This central site was restored and upgraded recently and almost 2 500 tonnes of pesticides were repacked and safely placed in concrete bunkers. Responsibility for obsolete pesticides storage sites and the Jangi site is assigned to the Phytosanitary Control Service.

Azerbaijan has never manufactured PCBs, a type of persistent organic pollutant that the parties to the Stockholm Convention are committed to reducing and, if possible, eliminating. The country has, however, imported PCB-containing equipment and oil from Russia and other countries and needs to build capacity to deal with the consequences. A GEF project focusing on the power sector is working to

enable Azerbaijan to comply with its obligations under the Convention, and is creating a national inventory of non-electrical equipment and other articles containing more than 0.005 per cent of PCBs, as required by the Convention.

The project is helping to dispose of at least 500 tonnes of PCB oil, equipment and wastes and is providing training to owners of electrical equipment containing PCB oil. The global benefit of the project will be the reduction of ongoing threats to human health and the environment by preventing future releases of PCBs into the environment through the improper management of electrical equipment. Another task is to enhance the regulatory frameworks and strengthen institutional capacity for the monitoring, management and treatment of PCBs.

Ozone-depleting substances

A GEF project implemented under the United Nations Industrial Development Organization is working to phase out the use of the HCFCs introduced to replace the ozone-depleting CFCs. This effort will contribute to a final phase-out of ozone-depleting substances. It will include an assessment of technical feasibility and economic viability and a cost-effectiveness and lifecycle analysis of this phase out. The project will also involve a detailed specification of appropriate technology transfer components in the foam, refrigeration and air-conditioning sectors.

As part of the GEF project, various government institutions and market parties are expected to invest in demonstration projects and to take the first steps in disseminating best practice.

Swiss-supported projects

The focus of Swiss development assistance in Azerbaijan is mainly on economic reform, however one project, conducted jointly with the German Development Bank (KfW), is contributing to improving the water supply and sewage system in the cities of Ganja (320 000 inhabitants) and Sheki (70 000 inhabitants) in north-east Azerbaijan. The Swiss State Secretariat for Economic Affairs contributed CHF 12 million to the project, which has improved drinking water quality and the reliability of supply, increased the efficiency of sewage collection and reduced pollution. In other areas of Azerbaijan, the World Bank is supporting an Urban Water Supply and Sanitation Program, which has a budget of USD 500 million.

Switzerland supported the implementation of GHS in Azerbaijan and Central Asia through regional workshops and training activities implemented by UNITAR. Another Swiss-supported project in Azerbaijan implemented by UNITAR strengthened country's capacities for the implementation of a national pollutant release and transfer register (PRTR) and SAICM Implementation.

Recommendations

In just a few years Azerbaijan has achieved impressive progress in addressing the legacies of past environmental mismanagement and is preparing to face emerging chemical and waste management problems. National and local authorities, the private sector, public organizations and individual citizens all have responsibilities and the potential to promote effective strategies for managing waste and chemicals.

The useful experience gained on the Absheron Peninsula with its dense concentrations of industry and people can and should be used to improve waste and chemical management across the country. Identifying waste and chemical problems and focusing assistance beyond the Absheron Peninsula is a logical next step.

National authorities

The national authorities of Azerbaijan can be justifiably proud of the achievements but should continue to promote the development of policies and incentives on waste and chemical management on a number of fronts.

These opportunities include:

- Improving the quality and coverage of statistical data on waste and chemicals
- Developing stable and sufficient financial models and incentives for efficient waste collection, sorting, recycling and disposal
- Promoting the Balakhani eco-industrial park and the Tamiz Shahar experiences on how to best approach waste problems at technical level, nationally and among neighbours
- Strengthening medical waste management practices by enforcing the existing regulations, training hospital staff in the separation of medical waste and developing a system for waste delivery to the new technical facility at Balakhani

- Expanding clean-up operations involving low radioactive waste, mercury and oil contaminated soils, eliminating unauthorized landfills, and implementing programmes for the minimization of waste and promotion of recycling beyond the Absheron Peninsula
- Improving wastewater treatment across the country, and working with upstream countries, especially Georgia and Armenia, on polluted waters entering Azerbaijan via the Kura and Aras rivers
- Continuing collaboration within the Tehran Convention on the Protection of the Caspian Sea on pollution prevention and minimizing the risk of industrial accidents and monitoring environmental quality
- Exchanging national experience with Central Asia and other counterparts on the political, technical and financial aspects of dealing with waste and chemical legacies and creating incentives for businesses and society
- Becoming party to the Rotterdam (prior informed consent) and Minamata (mercury) Conventions
- Further enhancing the implementation of the GHS

Local authorities

Municipalities have limited financial resources and technical knowledge, however as landowners they have responsibility for contaminated sites. Despite their limitations, local authorities have the potential to help improve waste and chemical management policy and practices in the following ways:

- Introducing environmental control measures at existing uncontrolled waste dumps
- Advocating, in cooperation with the national authorities, for the improvement of landfills and the mitigation of contaminated sites, and for recycling and clean cities initiatives and more effective tariff policy

- Raising public awareness about the risks of local hazardous waste and chemical sites, including the dangers of uncontrolled access and exposure
- Promoting the environmental image of their communities and taking advantage of market incentives for waste management, including recycling

The private sector

The private sector has the ability to innovate and to promote technology for waste and chemical management, and to share its experience and knowledge with national and local authorities. The potential of the private sector to improve waste and chemical management involves:

- Introducing environmental management systems and production practices that minimize waste generation and chemical use
- Supporting local municipalities in clean-up projects, and cooperating with local citizens to improve their areas
- Developing and exploiting markets for waste – environmentally sound recycling and reuse
- Improving industrial and chemical safety, particularly for emergency scenarios, by adopting best environmental practice

Individual citizens and public organizations

Individuals and civic organizations are important stakeholders who often drive initiatives that can influence policy at all levels, and whose goodwill is crucial to achieving local and national waste goals. In addition, consumer behaviour influences the marketplace and may determine the level of chemical use in important ways. The opportunities for public organizations to make a difference include:

- Disseminating information on the dangers of hazardous waste and chemicals to farmers, children and others
- Promoting waste clean-up initiatives and sound chemical management to help raise public awareness and encourage better environmental practices
- Raising public awareness of the adverse effects of the unsound management of chemicals and waste on human health
- Promoting the results and benefits that they receive thanks to local sustainability initiatives

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Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal → www.basel.int

Globally Harmonized System of Classification and Labelling of Chemicals (GHS) → www.unece.org/trans/danger/publi/ghs/pictograms.html

International HCH & Pesticides Association (IHPA) → www.iHPA.info

International POPs Elimination Network (IPEN) → www.ipen.org

Interstate Statistical Committee of the Commonwealth of the Independent States → www.cisstat.com

NASA Ozone web-page → earthobservatory.nasa.gov/Features/WorldOfChange/ozone.php

National hazardous waste management centre of Azerbaijan → tpoligon.com

Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade → www.pic.int

Stockholm Convention on Persistent Organic Pollutants (POPs) → www.pops.int

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Zoï Environment Network → www.zoinet.org

Abbreviations

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|--------------|---|
| CFC | Chlorofluorocarbon |
| DDT | Dichlorodiphenyltrichloroethane |
| GDP | Gross Domestic Product |
| GEF | Global Environment Facility |
| HCFC | Hydrochlorofluorocarbon |
| ODS | Ozone-depleting substance |
| OECD | Organisation for Economic Co-operation and Development |
| PCB | Polychlorinated biphenyl |
| POP | Persistent organic pollutant |
| SAICM | Strategic Approach to International Chemicals Management |
| SOCAR | State Oil Company of the Azerbaijan Republic |
| UNDP | United Nations Development Programme |
| UNECE | United Nations Economic Commission for Europe |
| UNEP | United Nations Environment Program |



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