Environmental data

2013

300 JAHRE
NACHHALTIGKEIT
IN SACHSEN

STAATSMINISTERIUM
FÜR UMWELT UND
LANDWIRTSCHAFT

Freistaat
SACHSEN

Contents

Preface

Dear readers,

The current environmental data give a brief insight into the forward-looking and sustainable environmental policy in the Free State of Saxony. The graphics included provide information about the most important environmental topics in Saxony such as renewable energies, climate protection, soil, water, air, nature, environmental economics, as well as developments in these areas. This information suggests a positive trend, showing that the Free State of Saxony is demonstrating significant progress in environmental policy again this year.

The environmental data are comprehensively documented in the Saxon Environmental Report from the current legislative period. The next publication is planned before this year's end.

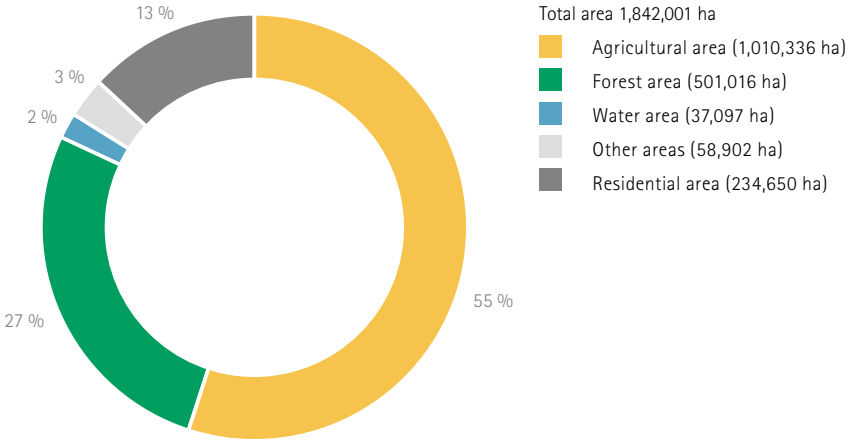
Frank Kupfer
Saxon State Minister for Environment and Agriculture

Land use

Saxony is the sixth-largest territorial state in Germany with very diverse landscapes and a valuable natural and cultural heritage. As in all of Central Europe, it is dominated by agricultural land utilization.

Source: Statistical Office of the Free State of Saxony 2012, Land utilization survey according to actual usage, data status: 31/12/2012, territorial status: 01/01/2011

Land utilization in Saxony 2012

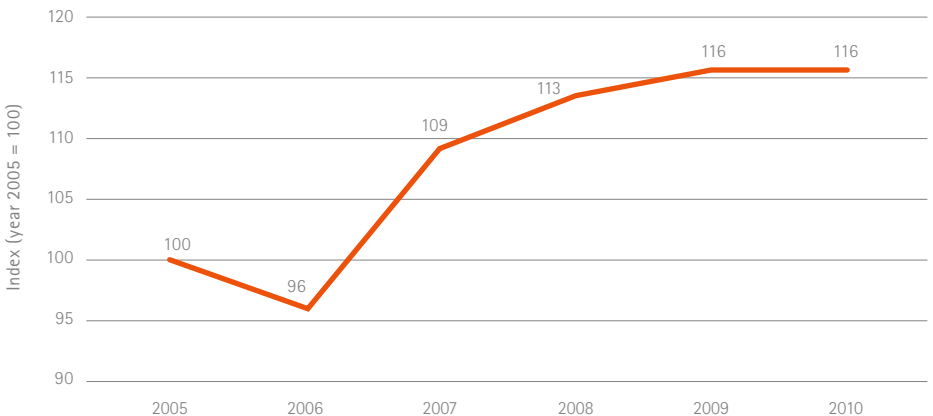


Raw materials productivity

In times when raw materials are becoming more scarce, it is important to view raw material consumption as distinct from macroeconomic growth. In this area, increasing values show a positive development. Several times in previous years, Saxony has achieved double-digit growth rates that are above that national average.

Source: Saxon State Office for Environment, Agriculture and Geology based on environmental economic resource accounting of the states, computation status: autumn 2012
gross domestic product (price-adjusted, linked)/raw material consumption; calculation status for gross domestic product: August 2010/February 2011

Raw materials productivity



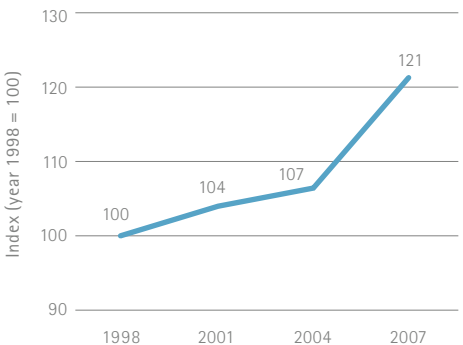
Water productivity

The water productivity indicates how much economic performance has been acheived per cubic metre of utilized water (EURO gross national product per m³ water utilization). Water productivity is significantly influenced by the economic structure and the proportion of water-consumption-intensive economic areas. A comparatively high water productivity means that the economic and industrial structure of a country is less water-consumption-intensive.

Changes in water productivity are influenced by "true" productivity improvements and declines as well as changes in the economic and industrial structure. The data show that the Free State of Saxony is on the way to a more sustainable mode of production. Current data about water productivity are planned for publication at the end of 2013.

Source: Environmental Accounting of the States, calculation status GDP: August 2012/February 2013, Note: GDP (price-adjusted, linked) per water utilization

Water productivity

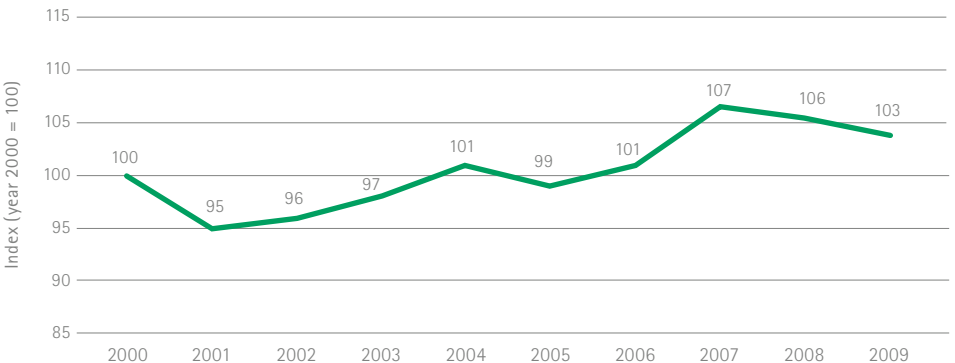


Energy productivity

Energy productivity is a significant indicator for efficient conversion from primary energy into final energy as well as efficient utilization of final energy for the creation of products and services. For several years, there has been a steady increase in energy productivity, which represents a peak in comparison to national figures.

Source: Saxon State Office for Environment, Agriculture and Geology based on the Environmental accounting of the states, autumn 2012

Energy productivity

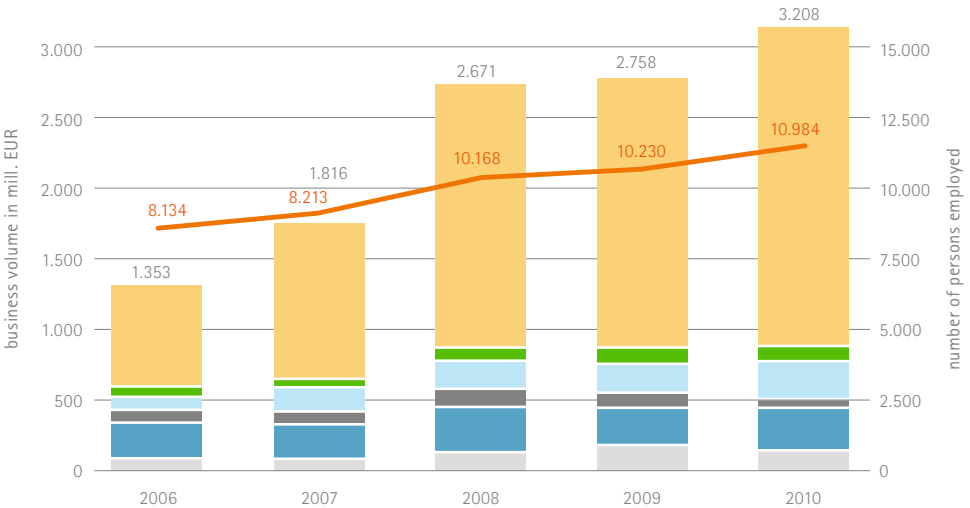


Environmental economics

The Free State of Saxony has highly effective environmental economics, which have demonstrated significant growth in business volume and employment in past years. Climate protection, in particular, has achieved a significant increase. It can thus be inferred that the proportion of environmental economic activity in the Saxon gross domestic product will continue to increase in the future.

Source: Statistical Office of the Free State of Saxony 2010

persons employed and business volume for climate protection

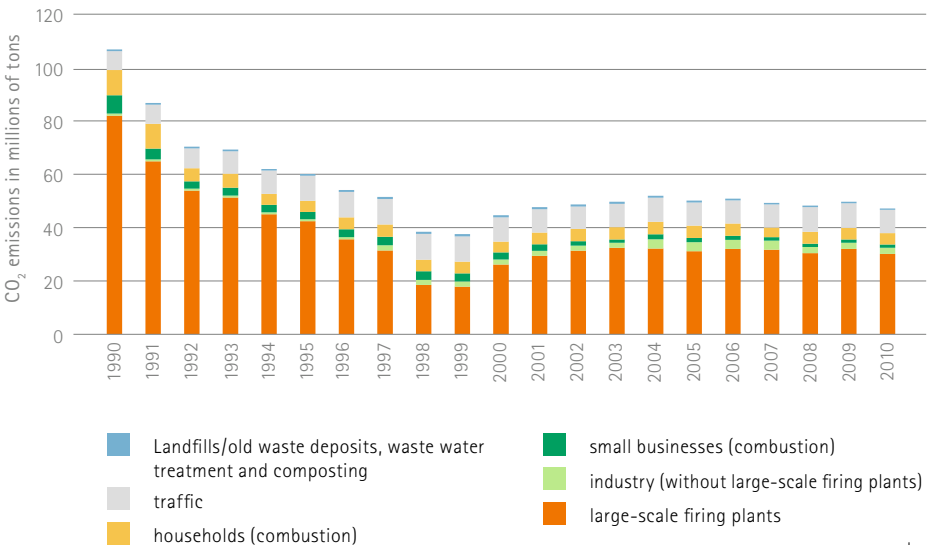


Greenhouse gasses

Climate change is accelerated by the accumulation of greenhouse gases in the atmosphere. The graphic shows the development of carbon dioxide emissions, which comprise 91% of greenhouse gas emissions. The primary causes are large-scale firing plants (large industrial facilities for power and heat production). In the 1990s, many facilities were shut down or renovated to reduce emissions. The increase at the beginning of the previous decade is due to new block-unit power stations.

Source: Saxon State Office for Environment, Agriculture and Geology, Emissions Cadastre 2010

Changes in CO_2 emissions in Saxony 1990 – 2010

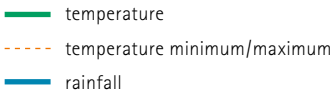


Climate

The current trend of decline in rainfall in vegetation period 1 (April through June) in Saxony is demonstrated by the climate reference station in Görlitz. In regions with high temperatures and light soil, this trend is already leading to perceptible changes in basic conditions.

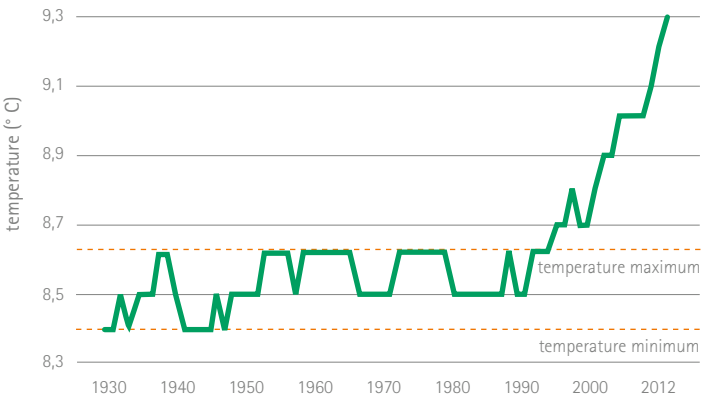
The trend of the 30-year average air temperature in the period between 1900 and 2012 in Saxony is shown by means of representational data from the Dresden station. From 1900 to 1990, the average fluctuated by ca. 0.25 degrees. After 1990, the temperature curve left this fluctuation range and began increasing at abnormally high rates. The mean value from the period between 1983 and 2012 is 0.6 degrees above the fluctuation range demonstrated for the period ending in 1990.

The rainfall and temperature data from the weather stations in Saxony show that climate change is a reality in the Free State. The Saxon state government has responded with the Climate and Energy Action Plan. The emissions goals stated in this plan are significantly higher than the European and German climate protection goals.



Source: Saxon State Office for Environment, Agriculture and Geology, Deutscher Wetterdienst 2012

development of air temperature in the Dresden area
(moving 30-year average for the periods 1901 – 1930 through 1983 – 2012)



development of rainfall in vegetation period 1 (April through June) climate reference station Görlitz
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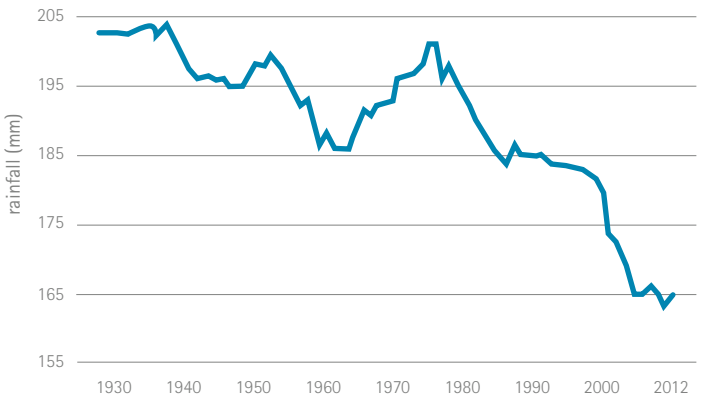
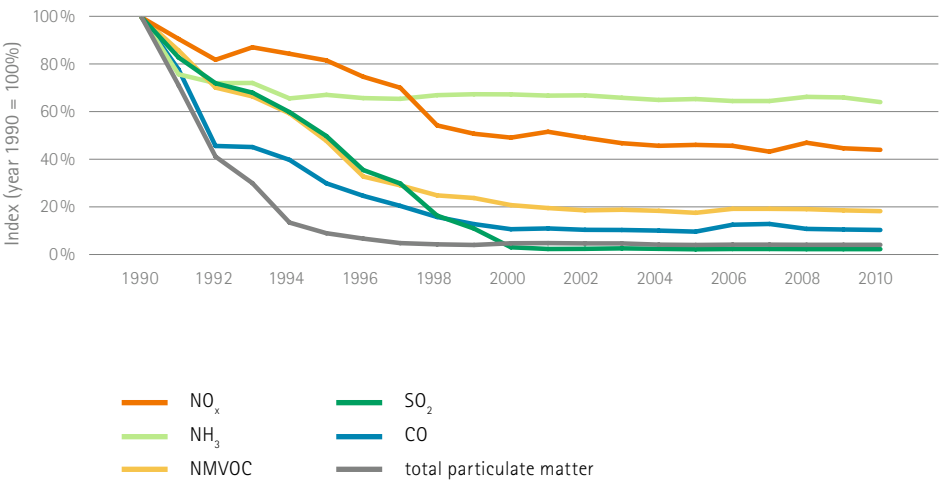


Air pollutants

Air pollutants have a wide range of negative impacts on people and the environment and should therefore be avoided. In the 1990s, it was possible to significantly reduce emissions; since that time there have not been many changes. For most pollutants, however, the concentrations have been far below the threshold values since that period. Problems are presented primarily by the pollutants ozone, nitrogen dioxide and particulate matter.

Source: Saxon State Office for Environment, Agriculture and Geology, Emissions Cadastre 2010

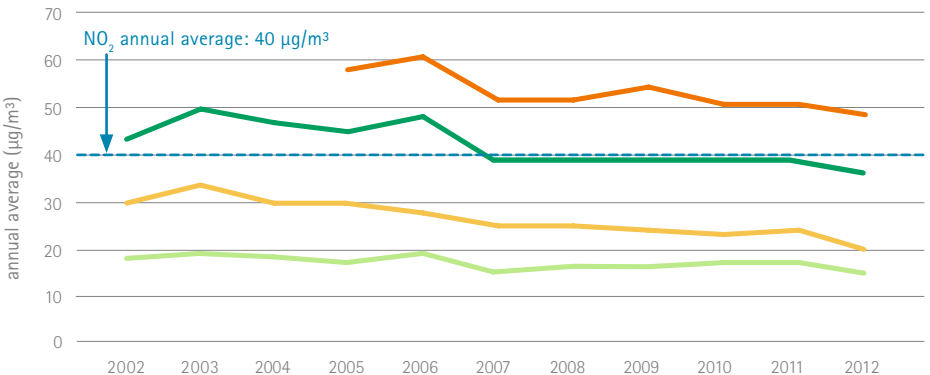
Emissions of air pollutants



The immission of air pollutants is demonstrated at various measuring stations in the Dresden area by the example of nitrogen dioxide. The most important sources are exhaust fumes from street traffic. Therefore the threshold values are often exceeded at traffic-oriented measuring stations, even when a slightly downward trend can be recognized in previous years. In 2012, there were predominantly favourable meteorological rates. There are, in contrast, no problems in the urban and regional background.

Source: Saxon State Office for Environment, Agriculture and Geology, 2012

immissions of air pollutants



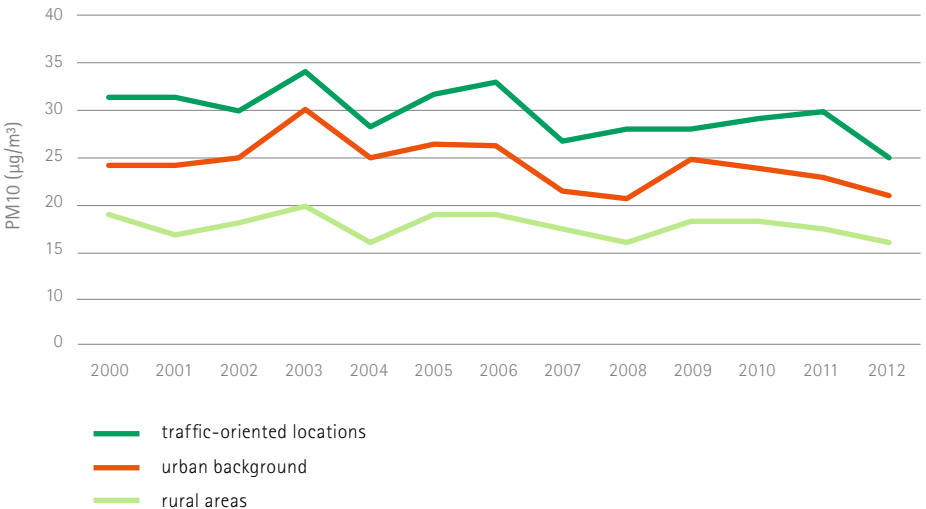
Note: the threshold value for the annual average has been in application since 2010. For the city of Dresden (as well as for Leipzig and Chemnitz), the EU has extended the deadline for threshold compliance until 2015.

Particulate matter

The most important sources of particulate matter are combustion processes and street traffic. Due to the fact that particulate matter can be transported in the atmosphere across large distances, the measured concentrations are not caused solely by sources within Saxony.
The data regarding the area-specific annual averages show no distinct trend. The fluctuations in recent years are due to changing meteorological conditions.

Source: Saxon State Office for Environment, Agriculture and Geology

Area-specific annual average values of PM10 concentration in Saxony

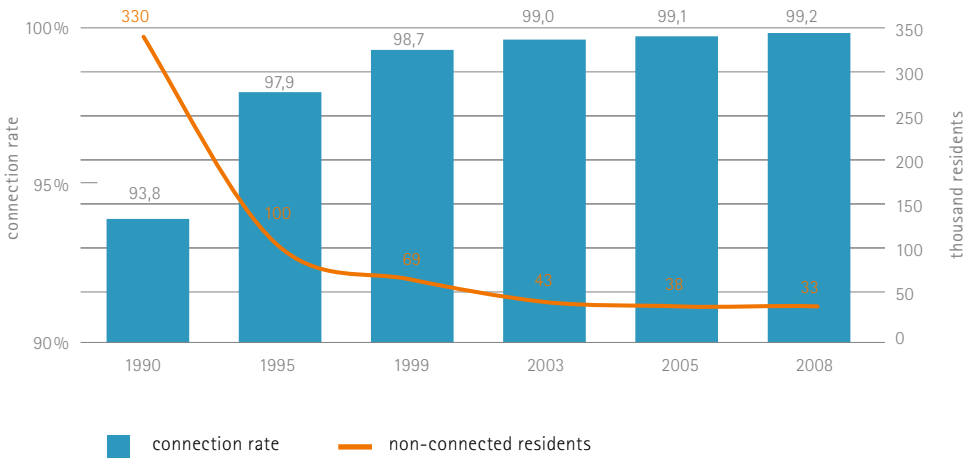


Connection rate of the public water supply

Access to clean, drinkable water is a basic necessity for human life. Through enormous investments in the last 20 years, it has been possible to increase the connection rate of public water supply.
Particularly in rural regions, however, there are still areas and individual parcels of land that, due to their location, are not connected or are only partially connected to the public water supply. A further significant increase in the connection rate is not fungible due to economic costs and is not planned

Source: Saxon State Office for Environment, Agriculture and Geology 2008

Connection rate of the public water supply

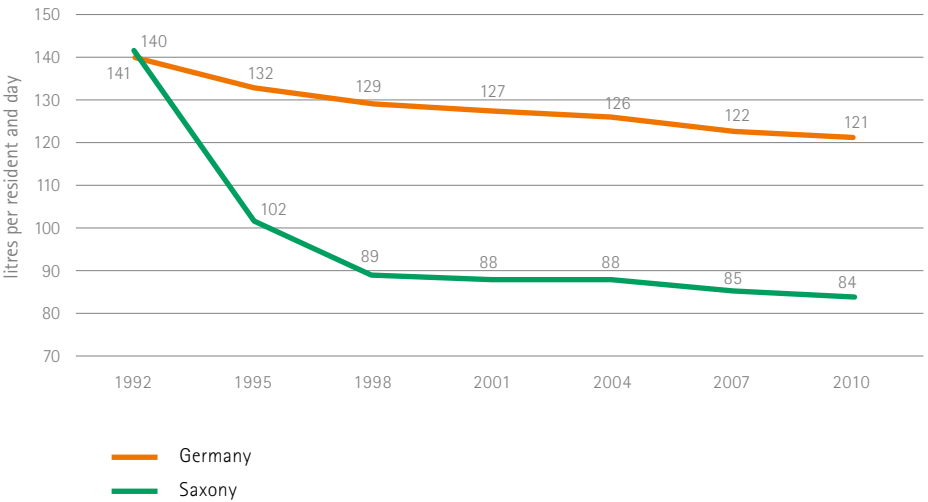


Water usage of households and small businesses

Through the introduction of water-saving technology, measurement-technological consumption recording and cost-effective water prices, the specific water consumption in the Free State of Saxony has significantly decreased particularly in the 1990s, and is moving towards a very low level. At 84 l/E*d for the area of households and small businesses, it is far below the national average of 121 l/E*d (2010).

Source: Statistical Federal Office, Saxon Ministry for Environment and Agriculture 2010

specific water consumption of households and small businesses

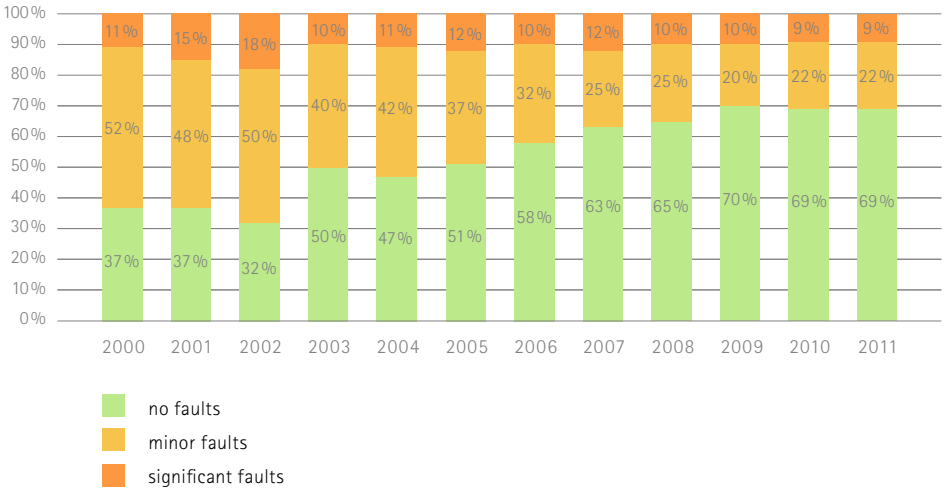


Assessments of facilities regarding usage of materials hazardous to water

In Saxony, around 4,500 assessments of facilities with materials hazardous to water are performed each year. The proportion of initial assessments in previous years has decreased due to repeat assessments. The number of fault-free facilities has risen in past years, in which the percentage of significant faults remains relatively consistently at 10%. In all assessments dangerous faults were only detected in the range of one-tenth of one percent. Compared to national values, more facilities in Saxony were fault-free in initial assessments, and notably fewer significant faults were detected.

Source: Saxon State Office for Environment, Agriculture and Geology 2011

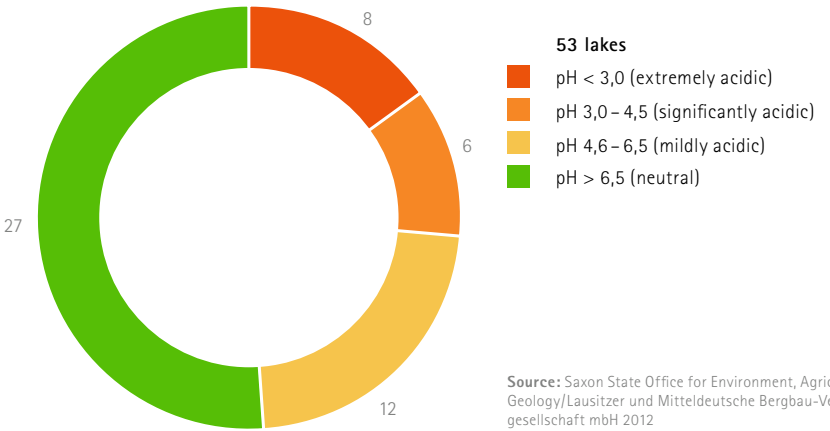
assessments of facilities regarding usage of substances hazardous to water



Acidification rate of former-mine lakes

Brown coal has been mined in Saxony for more than 150 years. The reclamation of land used for this purpose is a large challenge. The abandoned open pits from open-cast mining become flooded, resulting in lakes. They often are contaminated with acids, iron and/or ferric sulphate as the result of previous pyrite decomposition. Overall, however, there is a trend toward better lake water quality. Of 53 assessed former-mine lakes with a surface of more than 10 ha, more than half had a neutral status in 2010. The rest were marginally to extremely acidic.

acidification rate of former-mine lakes 2012 in Saxony



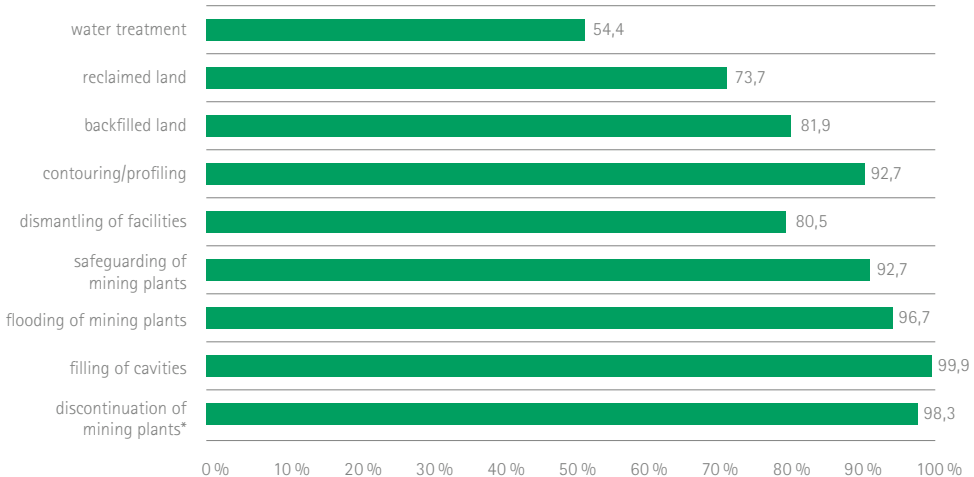
Source: Saxon State Office for Environment, Agriculture and Geology/Lausitzer und Mitteldeutsche Bergbau-Verwaltungsgesellschaft mbH 2012

Uranium mine site reclamation in Saxony

Another major task is the reclamation of former uranium mines. Uranium ore was mined until the early 1990s in various regions of Saxony and caused increased radiation exposure in those regions. There have been significant advancements in site reclamation. More than 90 % of all underground reclamation measures have already been carried out. In above-ground measures, water treatment in particular poses a long-term task.

Source: Saxon State Office for Environment, Agriculture and Geology based on data from Wismut GmbH 2013

status of uranium mine site reclamation in Saxony



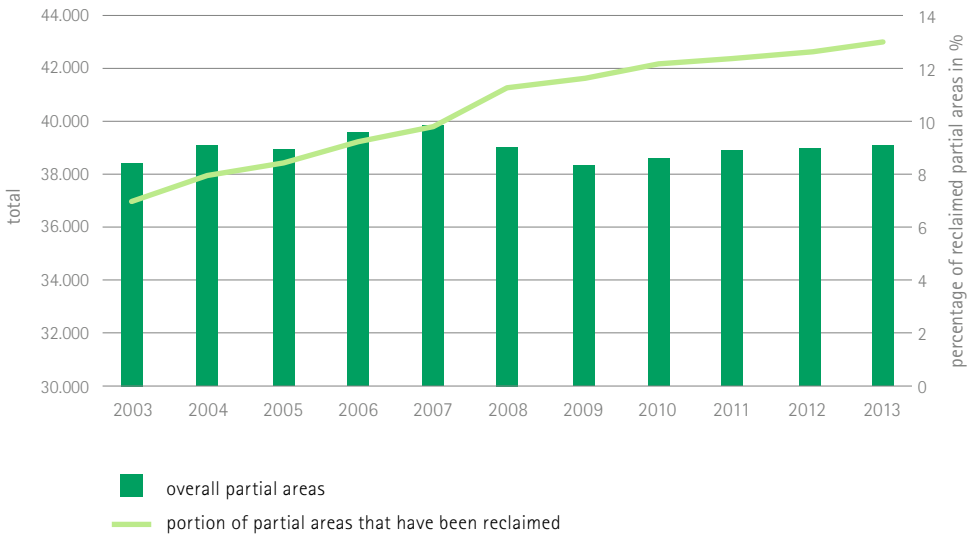
* included are the bismuth galleries and the southern gallery breakover, which are being re-excavated

Polluted area reclamation

The positive trend, spanning many years, in the quantity and percentage of reclaimed polluted areas is due to constantly increasing advancements in reclamation. Land reclamations are based on studies of risk assessment. Reclaimed sites can once again be used; some sites continue to be monitored.

Source: Saxon State Office for Environment, Agriculture and Geology 2013

quantity and percentage of reclaimed polluted sites



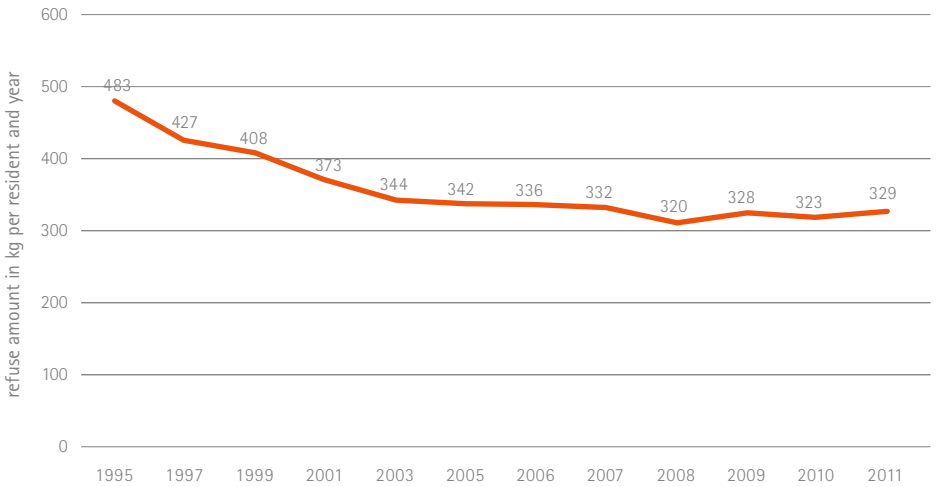
Municipal refuse

The production of refuse from private households and small businesses has been decreasing for years. Between 1995 and 2011, the amount per resident has been reduced by about one third. A further significant change has occurred in disposal procedures. While in 1995, around 90 % of municipal refuse was stored in landfills, today the majority of recyclable material is treated or refined mechanically, biologically or thermally.

refuse amount

Source: Saxon State Office for Environment, Agriculture and Geology 2011

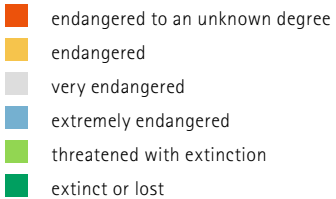
municipal refuse from private households



Nature conservation

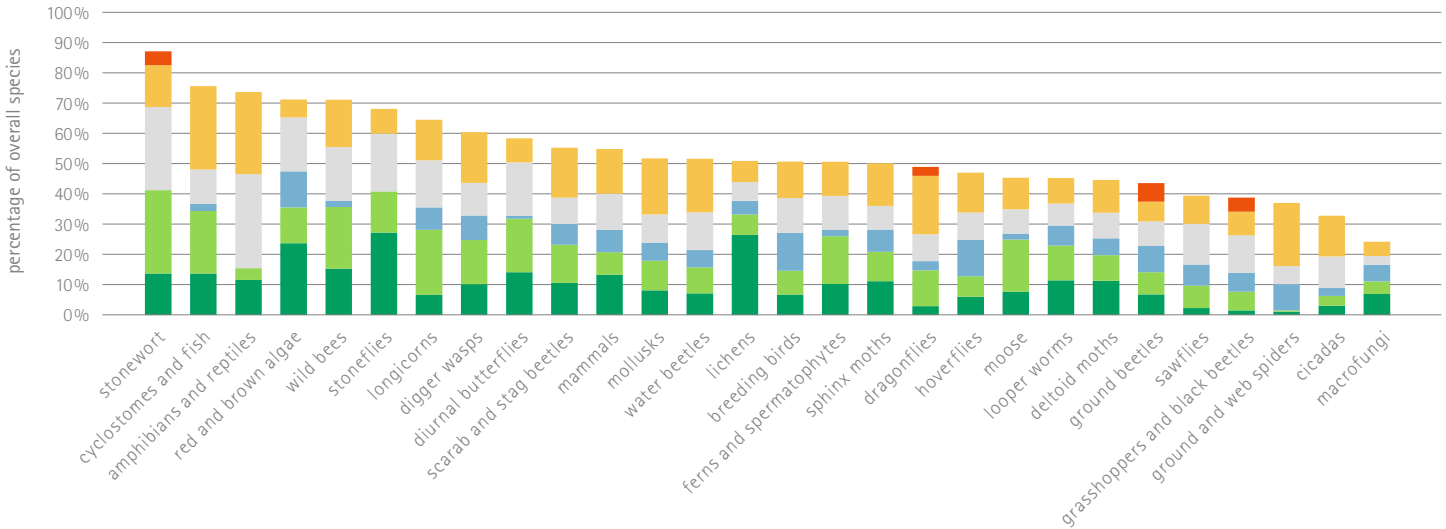
Saxony has a rich variety of flora and fauna. There are natural occurrences of approximately 30,000 animal species, 6,500 fungus and lichen species and 3,300 plant species including higher algae (without neobiota and microorganisms). For several reasons, their living conditions are impaired. As a result, many species are endangered, threatened with extinction or extinct. Particularly endangered are stonewort, cyclostomes as well as fish, amphibians and reptiles, red and brown algae, wild bees, stone flies and longicorns.

There are also positive developments such as initial evidence of Alcathoe's bats and findings of animal species such as the wildcat and plant species such as stachys germanica, blue-green junegrass and rubus constrictus blackberries. Furthermore, in recent years the quality of many watercourses has improved, which has made it possible for more demanding species to find habitats.



Source: Saxon State Office for Environment, Agriculture and Geology 2012

Degree of endangerment for animal and plant species in Saxony (selected groups)



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