2024

Environmental Data – Environmental indicators for Baden-Württemberg

LUBW

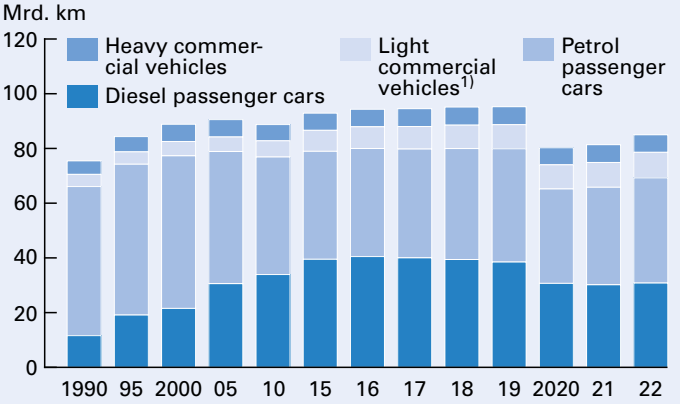
Baden-Württemberg
STATISTISCHES LANDESAMT

General data, traffic

	Unit	1991	2022
Population, economy			
Annual average population[1)]	Mill.	9.9	11.2[2)]
Gross domestic product at current prices[1)]	Mill. EUR	242,884	572,837
Employed persons in Germany[1)]	Mill.	5.2	6.4
Stock of motor vehicles		**1991**	**2022[3)]**
Stock of passenger cars	1,000	5,035	6,867[4)]
Petrol-engined passenger cars	1,000	4,308[5)]	4,272[4)]
Diesel-engined passenger cars	1,000	727	2,036[4)]
Hybrid, gas, electric and other forms of propulsion	1,000	–	560[4)]
New car registrations	1,000	526	367
Electric, plug-in hybrid and other forms of propulsion	%	–	*35.1*
Total annual mileage	Mill. km	76,692	84,999
Passenger traffic	Mill. km	69,401	70,923
Passenger cars	Mill. km	67,145	69,258
Freight traffic	Mill. km	7,291	14,076
Heavy commercial vehicles	Mill. km	5,083	6,414
Light commercial vehicles	Mill. km	2,209	7,662
		2004	**2021**
Local passenger transport services[6)]	Pkm/Inh.	1,089	772

1) www.vgrdl.de; calculation status August 2022/February 2023, population base census 2011. – 2) Population as of June 30 – 3) Excluding temporarily decommissioned vehicles. – 4) Value for 2023. – 5) Including gas and other forms of propulsion. – 6) 2004: Calculation based on 1987 census, 2021: Calculation based on 2011 census.

Annual mileage of road traffic



1) Incl. Motorcycles and buses.

Data source: Traffic census results of the Ministry of Transport Baden-Württemberg and own model calculations.

Objective In order to reduce greenhouse gas emissions from traffic by 55 % by 2030 compared to 1990 with a traffic turnaround, motor vehicle traffic is to be reduced by then.

Trend: The annual mileage has increased up to 2019. In 2020, annual vehicle mileage fell significantly as a result of the COVID-19 pandemic, especially in passenger car traffic, which fell by 18 % compared to the previous year. Since then, vehicle traffic has been increasing again, but is still around 11 % below pre-pandemic levels.

Land use, nature and landscape

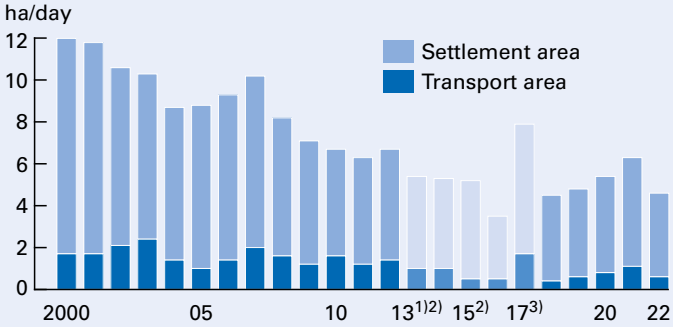
	Unit	1996	2022
Total area (TA)[1)]	1,000 ha	3,575	3,575
Settlement and Traffic Area (SaT)[1)2)]	% of TA	*12.7*	*14.8*
Traffic	% of SaT	*41.2*	*37.7*
Residential area	% of SaT	*25.8*	*30.1*
Industrial and Commercial space	% of SaT	*11.5*	*14.2*
Sports, Leisure and Relaxing area, other	% of SaT	*21.5*	*18.0*
Increase in settlement and traffic area	ha/day	10.3	4.6
Forest[1)]	1,000 ha	1,341	1,353
Forest condition: Percentage of noticeably damaged trees	%	*35*	*46*
Agriculture[1)]	1,000 ha	1,696	1,604
Utilised agricultural area (UAA)	1,000 ha	1,475	1,408
Areas under organic farming[3)]	% of UAA	*3.0*	*14.5*

		1992	2023
Protected areas (partly overlapping)[4)]			
National park	% of TA	–	*0.3*
Nature reserves	% of TA	*1.4*	*2.5*
Protected forests	% of TA	*0.2*	*0.2*
FFH areas[5)]	% of TA	–	*12.1*
Bird reserves	% of TA	–	*11.2*
Biosphere areas	% of TA	–	*4.2*
Water protection areas	% of TA	*14.8*	*27.0*

1) As at December 31 of each year. – 2) Sum of settlements (without mining operations, open pit, mine, quarry) plus traffic. – 3) Source: Federal Ministry of Food and Agriculture. – 4) Data source: Landesanstalt für Umwelt LUBW. – 5) Protected areas according to the EU Fauna-Flora-Habitat Directive.

Land consumption

– Increase in settlement and transport area (SaT)*) –



*) Sum of settlements (without mining operations, open pit, mine, quarry) plus traffic. As at december 31 of each year. – 1) 2013 and 2014 average of the two years. – 2) Years 2013 to 2016 not reliable due to incomplete surveys in the course of the conversion to ALKIS and later the conversion of the coordinate system. – 3) The year 2017 is not reliable in view of existing special effects due to subsequent changes and land readjustments.

Data source: Land survey.

Objective: Baden-Württemberg aims at a demand-oriented land designation and efficient, resource-saving use of land. A net-zero land consumption is targeted by 2035.

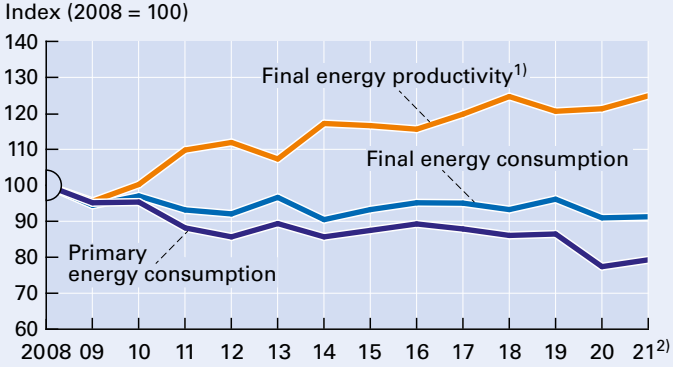
Trend: The settlement and traffic area in Baden-Württemberg increased by 1,673 hectares in 2022, an average of 4.6 hectares per day. In 2021, the new use of land by settlements and traffic was significantly higher, at 6.2 hectares per day.

Energy consumption and productivity

	Unit	1991	2021[1)]
Primary energy consumption	TJ	1,514,777	1,314,040
Fossil energy sources	%	*72.6*	*67.5*
Nuclear energy	%	*24.5*	*9.3*
Renewable energy sources	%	*1.9*	*17.2*
Electricity and others	%	*1.0*	*6.0*
Final energy consumption	TJ	1,030,789	1,027,631
Final energy consumption of households	TJ	303,043	335,897
per inhabitant[2)]	GJ	30.6	30.2
Final energy productivity[3)]	EUR/GJ	235.6	524.5
	2008 = 100	85.9	124.9
		1995	**2021[1)]**
Total electricity consumption	Mill. kWh	66,493	67,623
Electricity consumption of households[4)]	Mill. kWh	17,274	17,630
per inhabitant[2)]	kWh	1,690	1,586
		1995	**2022[5)]**
Electricity generation	Mill. kWh	64,773	53,904
Fossil fuels and others[6)]	%	*33.9*	*44.9*
Nuclear energy	%	*58.1*	*20.7*
Renewable energy sources	%	*8.0*	*34.4*

1) Preliminary results. – 2) Annual average based on the 2011 census; AK VGRdL, calculation status August 2022/February 2023. – 3) Reference values for figures in EUR/GJ: gross domestic product at current prices; for figures index: gross domestic product price-adjusted, chain-linked; AK VGRdL, calculation status August 2022/February 2023; own calculations. – 4) From 2011, household customers in accordance with the Energy Industry Act (EnWG). – 5) Calculation status December 2023. – 6) Coal, natural gas, fuel oil, diesel oil, petroleum coke, liquid gas, refinery gas, pumped storage water without natural inflow, non-biogenic waste, other energy sources.

Energy consumption and final energy productivity



1) Ratio of gross domestic product to final energy consumption. – 2) Preliminary figures.

Data sources: Energy balances for Baden-Württemberg, as of March 2023; Working Group „Environmental and Economic Accounts of the Federal States".

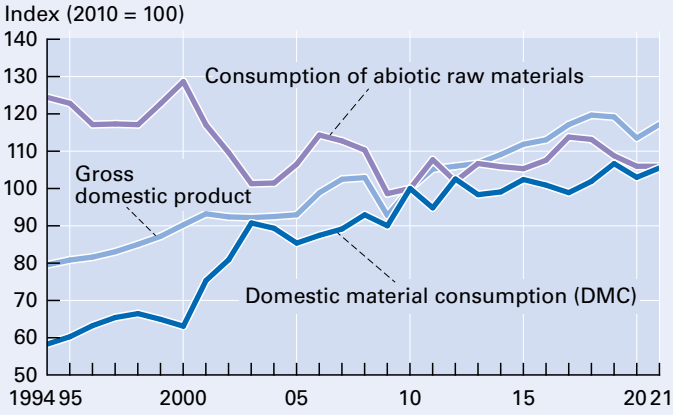
Objective: The German sustainability strategy of 2021 formulates the goal of increasing final energy productivity by 2.1 % annually by the target year 2050, based on the year 2008.

Trend: In Baden-Württemberg, the annual increase in final energy production has averaged 1.7 % since 2008, which is below the federal government's target. Nevertheless, the increase in final energy productivity shows that overall economic growth in Baden-Württemberg is increasingly decoupled from energy consumption.

Raw material consumption and productivity	Unit	1994	2021
Consumption of non-renewable raw materials (raw material consumption)		156,928	133,664
Recycled raw material extraction in the country[1]	1,000 t	138,908	105,668
Non-renewable (abiotic) resources	1,000 t	120,373	86,359
Energy sources	1,000 t	384	443
Mineral raw materials	1,000 t	119,989	85,916
Construction minerals	1,000 t	117,523	81,641
Biotic raw materials	1,000 t	18,535	19,309
Import of non-renewable goods from abroad[2]	1,000 t	34,423	43,867
Other goods and additional estimates[2]	1,000 t	–	1,898
Receipt minus dispatch from/to other federal state(s) (non-renewable goods)	1,000 t	2,132	1,540
Export of non-renewable goods abroad[2]	1,000 t	18,802	27,468
Other goods and additional estimates[2]		–	2,007
Raw material productivity[3] of			
direct material input (DMI)[4]	EUR/t	1,094	2,151
	2010 = 100	77	108
consumption of non-renewable raw materials (DMIa)[5]	EUR/t	1,674	4,032
	2010 = 100	64	111
domestic material consumption (DMC)[6]	EUR/t	1,664	4,193
	2010 = 100	58	105

1) Recalculated for methodical reasons. – 2) As of reporting year 2017, „Other goods and additional estimates" are reported seperately. – 3) Reference value for figures in EUR/t: gross domestic product at current prices; for figures in index: gross domestic product price-adjusted, chain-linked; VGRdL, calculation status August 2022/February 2023. – 4) Raw material extraction including import and receipt minus dispatch from/to other federal state(s). – 5) Consumption of non-renewable raw materials (DMI non-renewable). – 6) Also takes export into account.

Consumption and productivity of raw materials



Data source: Working Group „Environmental and Economic Accounts of the Federal States".

Objective: The aim is to reduce the consumption of domestic primary mineral raw materials by increasing resource efficiency, their substitution and the recycling of building materials.

Trend: There has been no reduction in raw material consumption in Baden-Württemberg over the past ten years. In contrast, raw material productivity shows an increasing trend despite considerable fluctuations. Since 2010, raw material productivity for non-renewable raw materials has increased by 16.6% in 2021, compared to 1994 by almost 73 %.

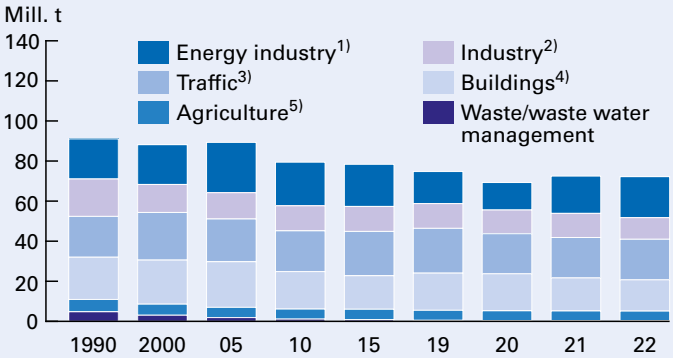
Greenhouse gas emissions

	Unit	2000	2022[1)]
Greenhouse gas emissions (GHG)[2)]	1,000 t CO_2-equivalents	87,974	72,037
	1990 = 100	97	79
per inhabitant	t	8.5	6.4
Nitrous oxide (N_2O)	% of GHG	*2.6*	*2.7*
	1990 = 100	92	78
Methane (CH_4)	% of GHG	*8.1*	*5.5*
	1990 = 100	76	42
Carbon dioxide (CO_2)	% of GHG	*87.5*	*89.9*
	1990 = 100	99	84
Fluorinated greenhouse gases (F-gases)[3)]	% of GHG	*1.8*	*1.9*
	1990=100	107	89
CO_2 emissions energy related[4)]	1,000 t	74,165	62,259
per inhabitant[5)]	t	7.2	5.5
CO_2 emissions from electricity generation[6)]	1,000 t	15,367	15,734

1) Estimated values for 2022. – 2) From firing systems (energy related), energy production and distribution, processes and product use, agriculture, waste and waste water management. Calculation status june 2023. – 3) Sum of fluorinated greenhouse gas emissions (HFC,PFC, SF_6 und NF_3). – 4) Direct emissions, not included up- and downstream processes, excluding international air traffic. – 5) Annual average, basic census 2011. – 6) Power plants for general supply and industrial thermal power plants.

Greenhouse gas emissions (CO_2, CH_4, N_2O, F-gases)

– in CO_2 equivalents –



1) Fuel input in energy industry, fugitive emissions. – 2) Fuel input in mining and manufactoring, industrial and construction machines, industrial processes and product use. – 3) Road transport and other transport. Excluding international air transport. – 4) Fuel input in households, commercial, institutional, small consumers, other fuel input like military. – 5) Livestock farming, manure management, agricultural soils, biogas plants, agricultural vehicles.

Data source: Working Group „Environmental and Economic Accounts of the Federal States"; Calculation status june 2023. Estimated values for 2022.

Objective: Baden-Württemberg should achieve net zero greenhouse gas emissions by 2040. In an intermediate step, a reduction of at least 65 % compared to total emissions in 1990 is to be achieved by 2030.

Trend: Overall, greenhouse gas emissions are falling slightly. In the energy industry and transport, which together cause over half of greenhouse gases, emissions in 2022 are still at the level of the reference year 1990. In order to achieve the reduction target for 2030, greenhouse gas emissions in these two sectors must be significantly reduced.

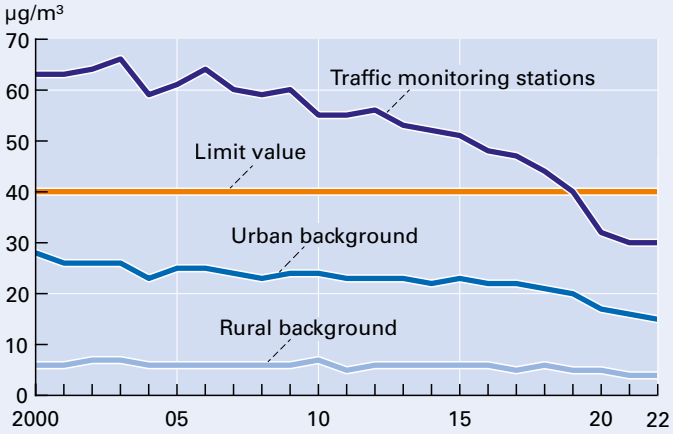
Air quality, immissions

	Unit	2021	2022
Number of measuring points with limit value exceedances			
Particulate matter PM_{10} Annual average values[1)]			
Spot measuring points close to traffic[2)]	Stations	0 of 3	0 of 3
Traffic monitoring stations	Stations	0 of 8	0 of 8
Urban background	Stations	0 of 25	0 of 25
Rural background	Stations	0 of 2	0 of 2
Particulate matter PM_{10} Daily average values[3)]			
Spot measuring points close to traffic[2)]	Stations	0 of 3	0 of 3
Traffic monitoring stations	Stations	0 of 8	0 of 8
Urban background	Stations	0 of 25	0 of 25
Rural background	Stations	0 of 2	0 of 2
Nitrogen dioxide Annual average values[1)]			
Spot measuring points close to traffic[2)]	Stations	1 of 26	0 of 11
Traffic monitoring stations	Stations	0 of 8	0 of 8
Urban background	Stations	0 of 25	0 of 25
Rural background	Stations	0 of 2	0 of 2
Ozone 8-hour average value[4)]			
Urban background	Stations	7 of 25	11 of 25
Rural background	Stations	1 of 2	1 of 2

1) Limit value: 40 µg/m³. – 2) Number, location and measurement scope of the spot measuring points change annually. Consequently, the characteristics are not comparable with other years. – 3) The daily average value of 50 µg/m³ may be exceeded a maximum of 35 times per year. – 4) The target value of 120 µg/m³ may be exceeded a maximum of 25 times per year (averaged over three years). Ozone is not measured at stations close to traffic.

Nitrogen dioxide (NO_2) immissions

– Annual average values –



Data source: Landesanstalt für Umwelt LUBW.

Objective: To protect human health, the Ordinance on Air Quality Standards and Emission Ceilings (39th BImSchV) stipulates that the immission limit value for NO_2 (averaged over a calendar year) of 40 µg/m³ may not be exceeded.

Trend: Nitrogen dioxide pollution has decreased significantly in recent years. Particularly at the traffic measuring stations, significant decreases have been recorded since 2017. The immission limit value of 40 µg/m³ was not exceeded at any measuring station in 2022. Nevertheless, the annual mean concentrations near traffic are still about twice as high as in the urban background.

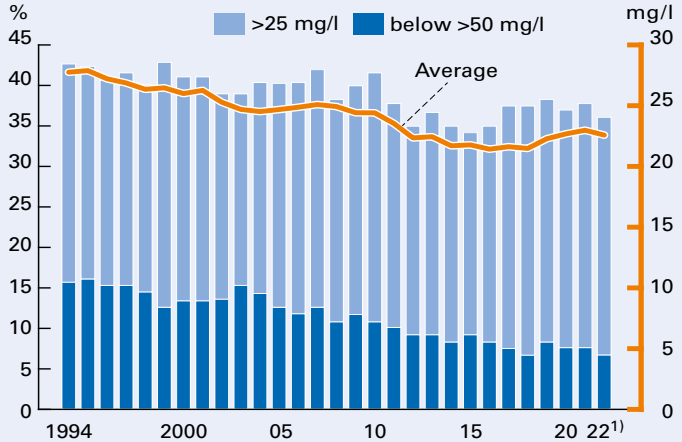
Water supply

	Unit	1991	2022[1)]
Total water extraction	Mill. m^3	6,867.7	2,904.3
Ground and spring water	Mill. m^3	758.7	669.2
Surface water	Mill. m^3	6,109.0	2,235.1
Water demand of the economy as a whole	Mill. m^3	6,150.1	2,240.2
including			
for cooling[2)]	Mill. m^3	5,755.5	2,014.1
production water[3)]	Mill. m^3	375,7	186.1
Public drinking water supply			
Distribution to households and small businesses	Mill. m^3	506.5	497.1
Drinking water consumption per inhabitant and day	litres	140	123
		1991	**2023**
Drinking water charges[4)]			
Consumption-based charge	EUR/m^3	1.07	2.44
Yearly basic charge	EUR	19.80	57.67
		1994	**2022**
Nitrate in groundwater			
Measuring points >25 mg/l	%	*42.6*	*36.1*
Measuring points >50 mg/l	%	*15.7*	*6.7*
Average	mg/l	27.8	22.6

1) Preliminary results. – 2) 1991 exclusively single use. – 3) Without service water. 1991 including for cooling in multiple and closed loop use. – 4) Weighted by population; including value added tax.

Nitrate in groundwater

– Proportion of measuring points*) with contents higher than 25 mg/l or 50 mg/l and average value –



*) 120 area-representatively selected monitoring sites (EEA monitoring network) were examined. – 1) Only 119 measuring points could be sampled in 2021 and 2022.

Data Source: Landesanstalt für Umwelt LUBW.

Objective: In Baden-Württemberg, the objective is to maintain good groundwater status in accordance with the Water Framework Directive and the Groundwater Regulation. For this purpose, the nitrate concentration must not exceed 50 mg/l.

Trend: In 2021, the limit value of 50 mg/l nitrate was not complied with at 8 of 119 monitoring sites. In the long term, nitrate pollution of groundwater shows a declining trend. However, nitrate continues to be the main contaminant of the groundwater.

Waste water and sewage sludge

	Unit	1991	2019
Waste water treated in public waste water treatment plants (annual waste water volume)[1)]	Mill. m^3	1,393.8	1,520.1
with nitrification	%	*44.9*	*99.7*
with denitrification	%	*24.0*	*98.7*
with phosphate elimination	%	*41.2*	*96.7*
with elimination of trace substances[2)]	%	.	*8.8*
Length of the public waste water collecting system	km	50,560	80,613
Waste water discharges of the economy as a whole[3)]	Mill. m^3	6,070.0	2,604.9
Indirect discharges	Mill. m^3	102.9	64.9
Direct discharges	Mill. m^3	5,967.1	2,540.0
Cooling water[4)]	Mill. m^3	5,748.5	2,396.8

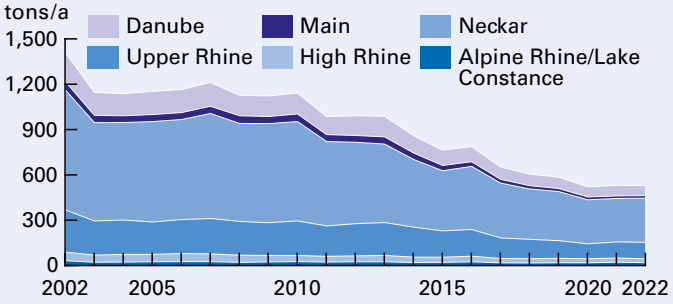
Waste water charges[5)]		1991	2023
Uniform rate[6)]	EUR/m^3	1.12	3.34
Split waste water charge			
Sewage water	EUR/m^3	.	2.11
Precipitation water	EUR/m^2	.	0.51

Municipal sewage sludge[7)]		1991	2022
Total sewage sludge production (dry matter)	1,000 t	385.6	220.4
incinerated (mono- and co-incineration)[8)]	%	*8.9*	*99.8*
utilized agriculturally	%	*17.8*	*0.1*
utilized for landscaping[9)]	%	*13.7*	*0.0*
landfilled	%	*59.6*	–

1) 1991 including public waste water treated in industrial waste water treatment plants. – 2) In the case of partial flow treatment, based on the annual waste water volume treated in the relevant waste water treatment plants. – 3) Including public waste water treated in industrial waste water treatment plants; 2019: 2.3 million m³. Excluding waste water discharged to other companies. – 4) Excluding cooling water discharged into the company's own waste water treatment plants. – 5) Weighted by population. – 6) 1991: 1 111 municipalities, 2023: 28 municipalities. – 7) Data source: Survey of public waste water disposal. – 8) Including gasification and sewage sludge supplied to waste water treatment plants in other federal states. – 9) Recultivation, other material recycling (2022: 88 t dry matter).

Discharge of phosphorus into water bodies*)

– Annual load of total phosphorus discharged via municipal waste water treatment plants –



*) The entire catchment areas of the water processing areas are considered.

Data source: Landesanstalt für Umwelt LUBW.

Objective: Nutrient inputs from waste water treatment plants are to be reduced through targeted measures to optimize phosphorus elimination.

Trend: Despite supply bottlenecks for the precipitants required to eliminate phosphorus due to the Russian war of aggression against Ukraine, phosphorus discharge from sewage treatment plants remained at the comparatively low level of the previous year.

Generation and treatment of waste

	Unit	1996	2020
Total waste generation	1,000 t	45,931.9	49,407.1
Landfill rate	%	*24*	*12*
Municipal waste	1,000 t	5,679.2	6,139.0
Commercial and industrial waste	1,000 t	2,031.2	1,758.1
Sludges from treatment of urban waste water	1,000 t	355,8	227,8
Construction and demolition waste (major mineral waste)	1,000 t	37,225.4	39,533.3
Landfill rate	%	*23*	*14*
Hazardous waste	1,000 t	640,4	1,749.0

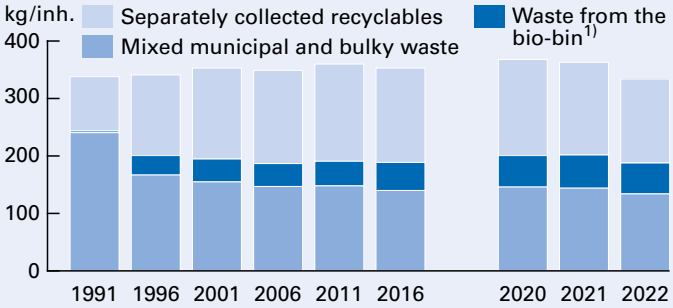
		1996	2022
Waste generated by households	1,000 t	3,538.2	3,757.2
per inhabitant	kg	342	334
Landfill rate	%	*36*	-
Mixed municipal and bulky waste per inhabitant	kg	167	134
Separately collected recyclables per inhabitant	kg	141	147
Waste from the bio-bin per inhabitant	kg	34	54

Waste treatment facilities (selected types)		1996	2021
Landfills	Number	605	298
Quantity of waste landfilled	1,000 t	10,822.5	6,071.9
Incineration plants[1)]	Number	8	41
Quantity of waste incinerated	1,000 t	574,7	4,225.2
Plants for biological treatment	Number	96	99
Quantity of waste treated	1,000 t	674,7	1,118.0
Sorting plants	Number	36	68
Quantity of waste treated	1,000 t	615,2	2,663.0

1) 2021: including combustion plants with energy recovery from waste.

Data source: Surveys of waste treatment according to §§ 3 to 5 of the Environmental Statistics Act and waste balance Baden-Württemberg.

Waste generated by households



Until 2010 population based on 1987 census, from 2011 population based on 2011 census. – 1) In some districts no separate collection of waste from the organic waste bin.

Data source: Waste balance Baden-Württemberg.

Objective: The objective is to further reduce the average household waste volume per inhabitant. At the same time, the aim is to increase the waste from the bio-bin and separately collected recyclables.

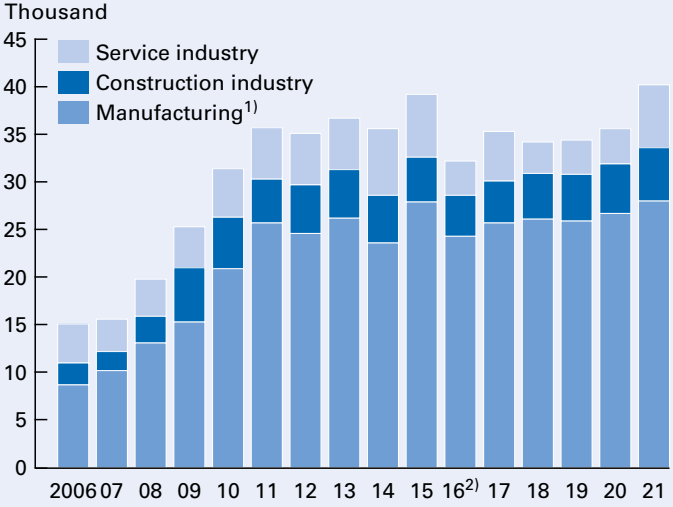
Trend: The per capita volume of domestic waste fell by 29 kilograms per capita per year in 2022 compared to the previous year. The cause is likely to be, among other things, a decline in private consumption as a result of the gas crisis and general price increases in 2022.

Environmental economics

	Unit	1996	2021
Expenditure on environmental protection in total	Mill. EUR	4,454.4	7,808.1
GDP share	%	*1.6*	*1.4*
Public expenditure			
Waste management	Mill. EUR	1,401.2	2,099.5
Investments in tangible fixed assets	%	*19.3*	*8.9*
Current expenditure	%	*80.7*	*91.1*
Sewage disposal	Mill. EUR	1,572.8	2,149.1
Investments in tangible fixed assets	%	*56.0*	*39.8*
Current expenditure	%	*44.0*	*60.2*
Expenditure on environmental protection in the manufacturing sector[1)]	Mill. EUR	1,480.4	3,559.4
Investments[2)]	%	*14.5*	*25.6*
Current expenditure[3)]	%	*85.5*	*74.4*
		1997	**2021**
Turnover of goods and services for environmental protection[2)]	Mill. EUR	1,196.9	15,041.6
Environmental Management[4)]			
EMAS-registered companies and organizations	Number	353[5)]	330[6)]

1) For better comparability, excluding the economic sections wastewater and waste disposal and pollution abatement belonging to the manufacturing industry as of 2008 (WZ 2008). – 2) Since 2006 including the environmental section Climate Protection. – 3) Expenditure on the operation of own facilities and other expenses. – 4) Data source: EMAS registry from DIHK. – 5) Value for 2007. – 6) As of October 2023.

Employees for the environmental protection within the economic sectors



1) Including mining and quarrying of stone and earth. – 2) From 2016 excluding smaller operations (approx. 300 units), due to changed legal situation.

Data source: Survey of goods and services for environmental protection.

Objective: The aim is to achieve a higher than average growth in the number of employees working in environmental protection.

Trend: The number of employees who produced goods and services for environmental protection was over 40,000 in 2021, significantly higher than in previous years. The increase can be observed in all sectors.

LUBW

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