

Key Environmental Statistics 2023



Ministry of Sustainability
and the Environment
— SINGAPORE —

The COVID-19 pandemic in 2020 and 2021 led to prevalent work-from-home arrangements and overall decline in economic activities. Indices affected are indicated with an asterisk (*) in the following sections:

- **Clean Air**
- **Solid Waste Management**
- **Environmental Health**
- **Food Safety and Security**
- **Water Resource Management**
- **Climate Change and Energy Efficiency**

Clean Air

Pollutant	Averaging Time	2020	2021	2022	2020 Air Quality Target for Singapore ¹
Sulphur Dioxide (SO ₂)* (µg/m ³)	24-hour ²	30	89 ³	37	50
Nitrogen Dioxide (NO ₂)* (µg/m ³)	1-hour ² Annual	118 20	123 25	128 25	200 40
Ozone (O ₃) (µg/m ³)	8-hour ²	145	176	124	100
Particulate Matter PM10* (µg/m ³)	24-hour ⁴ Annual	43 25	51 28	51 24	50 20
Particulate Matter PM2.5* (µg/m ³)	24-hour ⁴ Annual	24 11	28 12	26 11	37.5 12
Carbon Monoxide (CO)* (mg/m ³)	1-hour ² 8-hour ²	1.6 1.2	1.3 1.2	2.1 1.7	30 10

Air Quality in terms of PSI⁵

Percentage of days in a year when Pollutant Standards Index (PSI) is in the	2020	2021 ⁶	2022
Good & Moderate range	100	99.5	100
Unhealthy range	0	0.5	0

¹ NEA is reviewing the long term air quality guidelines for Singapore, taking into account the latest World Health Organisation (WHO) Air Quality Guidelines (AQG).

² Maximum 24-hour (SO₂), 8-hour (Ozone, CO) or 1-hour (CO, NO₂).

³ The maximum recorded 24-hour SO₂ level of 89µg/m³ was only observed on 1 day in 2021. The second highest recorded level was significantly lower at 37µg/m³.

⁴ 99th percentile.

⁵ PSI includes Sulphur Dioxide (SO₂), Particulate Matter (PM10), Particulate Matter (PM 2.5), Nitrogen Dioxide (NO₂), Carbon Monoxide (CO) and Ozone (O₃). Figures are rounded to the nearest 0.5.

⁶ There were 2 days in 2021 where PSI entered the Unhealthy range due to elevated Ozone levels.

Solid Waste Management*

	Unit	2020	2021	2022
Total waste generated ¹	Mil tonnes/yr	5.88	6.94	7.39
Total waste recycled ²	Mil tonnes/yr %	3.04 52	3.83 55	4.19 57
Total waste incinerated ³	Mil tonnes/yr %	2.62 44	2.88 42	2.97 40
Total waste landfilled ⁴	Mil tonnes/yr %	0.22 4	0.23 3	0.23 3
Total domestic waste disposed of ³	Mil tonnes/yr	1.53	1.58	1.63
Total domestic waste disposed of per capita	Kg a day /person	0.75	0.81	0.80
Domestic recycling rate ²	%	13	13	12
Total non-domestic waste disposed of ³	Mil tonnes/yr	1.31	1.54	1.57
Total non-domestic waste disposed of per \$billion GDP	Tonnes a day/GDP (\$billion)	8.2	8.7	8.5
Non-domestic recycling rate ²	%	68	70	72
Total energy produced from incineration	MWh	1,060,607	1,177,668	1,502,487

Lifespan of landfill⁵

36 years

¹ Total waste generated = Total waste recycled + Total waste incinerated + Total waste landfilled

² Sustainable Singapore Blueprint target for 2030 is 70% for overall recycling rate, 30% for domestic recycling rate and 81% for non-domestic recycling rate.

³ Figures exclude metals recovered from Incineration Bottom Ash.

⁴ Total waste landfilled includes non-incinerable waste such as construction and demolition waste, used slag and treated sludge etc. and excludes incineration ash generated from waste disposed through incineration.

⁵ Measured from the start of the lifespan of Semakau landfill, i.e. 1999.

Solid Waste Management*

Waste Stream	Amount of Waste Generated (Tonnes/yr)	Amount of Waste Recycled (Tonnes/yr)	Recycling Rate 2022 (%)	Percentage Point Change from 2021 Recycling Rate (%)
Paper/Cardboard	1,064,000	394,000	37	-2
Ferrous metal	1,338,000	1,331,000	99	0
Plastics	1,001,000	57,000	6	0
Construction & Demolition	1,424,000	1,419,000	99	0
Food	813,000	146,000	18	-1
Horticultural	221,000	188,000	85	2
Wood	419,000	298,000	71	-5
Ash & sludge	241,000	27,000	11	2
Textile/Leather	254,000	5,000	2	-2
Used slag	169,000	166,000	99	0
Non-ferrous metal	92,000	91,000	98	0
Glass	73,000	11,000	14	1
Scrap tyres	26,000	25,000	95	0
Others (stones, ceramics, rubber etc.)	249,000	30,000	N.A.	N.A.
Overall	7,385,000	4,188,000	57	2

Note: The figures may not add up to the total due to rounding off.

The recycling rate for the "Others" category is not meaningful as it is an aggregation of miscellaneous waste types that are managed and recycled differently.

Metal recovered from incineration bottom ash for recycling is excluded from waste disposed of.

Wood and horticultural waste recycled include 414,000 tonnes sent to facilities (e.g. biomass power plants and Sembcorp's Energy from Waste plant) for use as fuel.

Environmental Health

Vector Control	2020	2021	2022
No. of local dengue fever cases per 100,000 population*	620	96	571

Note: Figures are based on the latest updated data from the Ministry of Health.

Food Safety and Security

Food Safety	2020	2021	2022
Foodborne illness cases related to foodborne outbreak ¹ per 100,000 population*	7.8	25.6	20.6
No. of licensed food establishments ²	50,906	51,809	52,599

Food Supply Resilience	2020	2021	2022
No. of the 5 most commonly consumed food items (seafood, eggs, chicken, pork and vegetables) that has less than 50% of supply from a single country	4 ³	4 ³	3 ⁴
No. of licensed local food farms ⁵	238	260	257

¹ The figures include only the number of persons (also known as cases) affected in foodborne outbreaks involving 15 or more persons.

² Comprises non-retail food establishments (e.g. food manufacturers, cold stores, slaughterhouses); and retail food establishments (e.g. food shops, food stalls, NEA hawker stalls and supermarkets).

³ The food items are seafood, chicken, pork and vegetables.

⁴ The food items are seafood, pork and vegetables.

⁵ Comprises of sea-based seafood, land-based seafood, vegetables, hen shell eggs and others (cattle, goat, frog and quail eggs).

Water Resource Management

Access	2020	2021	2022
Improved Drinking Water Sources ¹	100%		
Improved Sanitation ²			
Tests meeting WHO drinking water quality guidelines			

System Efficiency	2020	2021	2022
Distribution Losses (%)	8.0	8.2	7.5
No. of leaks per 100 km of potable water pipelines*	3.8	4.2	4.1
No. of disruptions per month per 1,000 km of sewers (average over a year)	10.0	10.1	9.9
Flood prone areas (Hectares)	28.0	28.0	27.0

Supply	2020	2021	2022
No. of reservoirs in Singapore	17		
Sale of potable water in Singapore (Mil m ³)			
• Domestic*	320.7	316.5	305.9
• Non-domestic*	180.5	184.9	200.8
Sale of NEWater* (Mil m ³)	141.1	148.9	148.2
Sale of Industrial Water* (Mil m ³)	13.0	11.4	12.0
Volume of used water treated* (Mil m ³)	608.1	608.5	603.2

¹ As defined by the World Health Organisation (WHO), i.e. water sources that, by nature of construction or through active intervention, are protected from outside contamination. These include piped water into premises, protected dug well, etc.

² As defined by WHO, i.e. sanitation facilities that hygienically separate human excreta from human contact. These include flush/pour flush toilets or latrines connected to a sewer, septic tank, etc.

Water Resource Management

Water Demand and Management	2020	2021	2022
Per Capital Household Water Consumption* (Litres/Day)	154	158	149

Public Outreach	2020	2021	2022
No. of lifestyle events held at reservoirs and waterways*	16	44	84
No. of ABC Waters projects completed by PUB (Cumulative) ¹	47	49	52



¹ Figures include projects carried out by public agencies and exclude test-bedding projects.

Climate Change and Energy Efficiency

Climate Change/Energy	Unit	2020	2021	2022
Total greenhouse gas emissions* ^{1,2}	MtCO ₂ e	49.7	53.7	NA ³
Energy consumption per dollar GDP (% improvement from 2005 levels)* ²	%	35.9	37.3	NA ³
Grid emissions factor ^{2,4}	kgCO ₂ /kWh	0.4074	0.4057	NA ³
Domestic electricity use per capita* ^{4,5}	MWh	1.45	1.52	NA ³

¹ Estimated using 2006 Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories and Global Warming Potential values from the IPCC 5th Assessment Report. International Bunker fuels are excluded in accordance with United Nations Framework Convention on Climate Change (UNFCCC) reporting guidelines.

² In accordance with IPCC Good Practice Guidance, figures may be periodically updated as more accurate data are made available.

³ Data will be available in 2024.

⁴ Data obtained from Energy Market Authority.

⁵ Data obtained from Department of Statistics.

Regional & International Collaboration

Environmental agreements that Singapore has ratified / acceded to

10 Mar 1976

- ▶ Treaty on the Non-Proliferation of Nuclear Weapons (NPT)

5 Jan 1989

- ▶ Vienna Convention for the Protection of the Ozone Layer
- ▶ Montreal Protocol on Substances that Deplete the Ozone Layer

2 Jan 1996

- ▶ Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal

22 Sep 2000

- ▶ 1992 Copenhagen Amendment to Montreal Protocol
- ▶ 1997 Montreal Amendment to Montreal Protocol

14 Jan 2003

- ▶ ASEAN Agreement on Transboundary Haze Pollution

12 Apr 2006

- ▶ Kyoto Protocol to the United Nations Framework Convention on Climate Change

31 Mar 2008

- ▶ Additional Protocol for the Application of Safeguards
- ▶ Modified Small Quantities Protocol for the Application of Safeguards

2014

- 22 Sep** ▶ Convention on the Physical Protection of Nuclear Material (CPPNM)
- 23 Sep** ▶ Doha Amendment to the Kyoto Protocol

22 Oct

- ▶ Amendment to the Convention on the Physical Protection of Nuclear Material

22 Sep 2017

- ▶ Minamata Convention on Mercury

1 Jun 2022

- ▶ Kigali Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer

18 Oct 1977

- ▶ Comprehensive Safeguards Agreement with a Small Quantities Protocol

2 Mar 1993

- ▶ 1990 London Amendment to Montreal Protocol

1997

29 May

- ▶ United Nations Framework Convention on Climate Change

15 Dec

- ▶ Convention on Assistance in the Case of Nuclear Accident or Radiological Emergency
- ▶ Convention on Early Notification of a Nuclear Accident
- ▶ Convention on Nuclear Safety

10 Nov 2001

- ▶ Comprehensive Nuclear Test-Ban Treaty (CTBT)¹

24 May 2005

- ▶ Stockholm Convention on Persistent Organic Pollutants
- ▶ Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade

10 Jan 2007

- ▶ 1999 Beijing Amendment to the Montreal Protocol on Substances That Deplete the Ozone Layer

12 Jul 2012

- ▶ ASEAN Plus Three Emergency Rice Reserve Agreement

21 Sep 2016

- ▶ Paris Agreement under the United Nations Framework Convention on Climate Change

30 Oct 2018

- ▶ Protocol to amend ASEAN Plus Three Emergency Rice Reserve Agreement

¹ This agreement is not yet in force

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