GAINS Workshop for EECCA Countries

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6 November 2023

Air Emissions Inventory in Georgia

MINISTRY OF ENVIRONMENTAL PROTECTION AND AGRICULTURE OF GEORGIA

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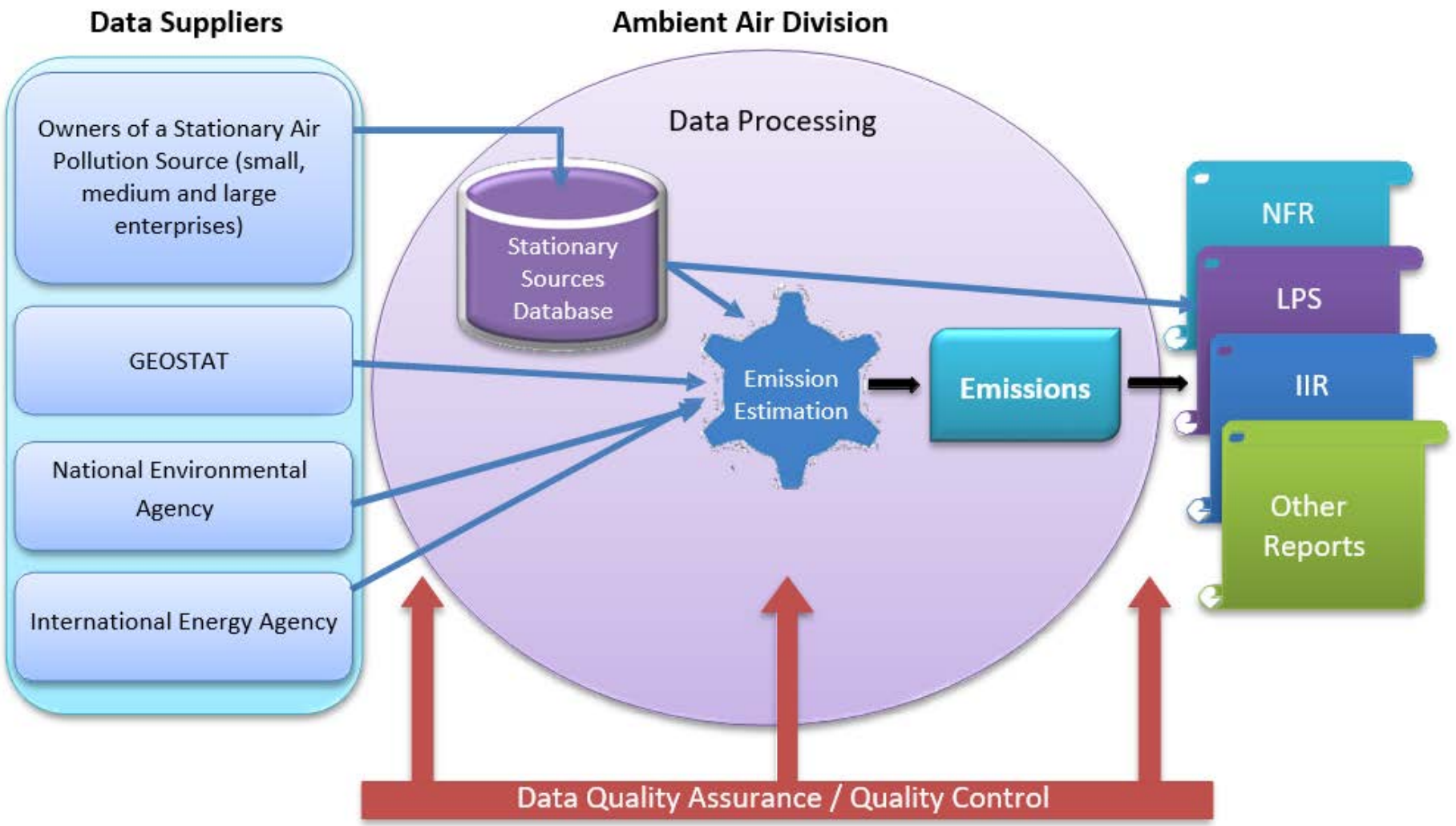
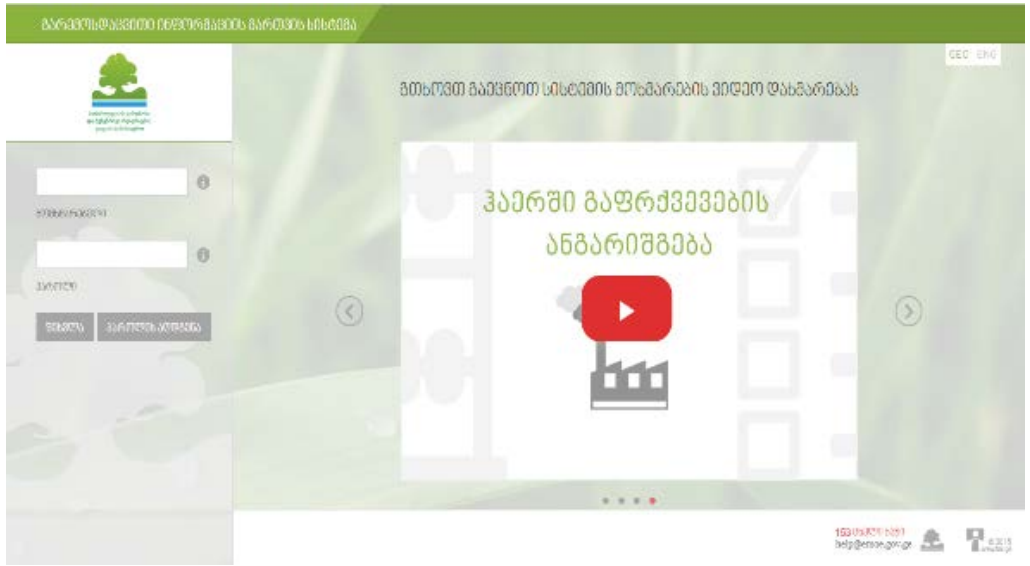
Emission Inventory Structure and Data Sources

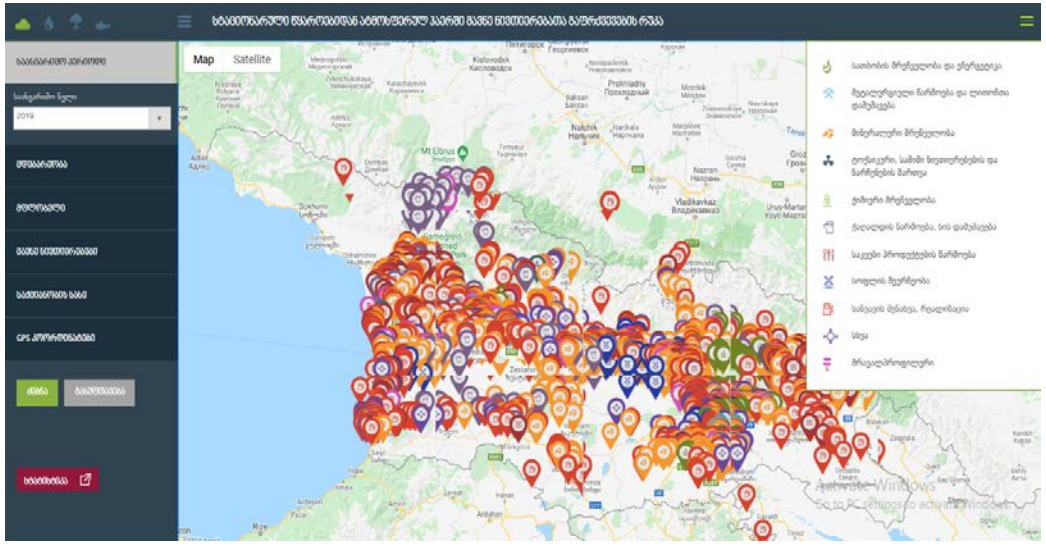


State Registry of Emissions from Stationary Pollution Sources

Electronic Air Pollution Reporting Module from Point sources - emoe.gov.ge



Map of emissions of pollutants into the ambient air from stationary sources - Map.emoe.gov.ge



Emission Inventory Methods

62 CATEGORIES calculated for 2021

1. ENERGY

- 1A1a Tier 1/2 method, EMEP/EEA Guidebook.
- 1A2b, 1A2d, 1A2e, 1A2f: Tier 2 method, EMEP/EEA Guidebook.
- 1A3b (i,ii,iii,v, vi), 1A3c and 1A3dii: Tier 1 method, EMEP/EEA Guidebook.
- 1A2a, 1A4ai, 1A4bi, 1A4ci, 1A4cii, 1B1a, 1B1b, 1B2ai, 1B2aiv, 1B2av, 1B2b, 1B2c: Tier 1 method, EMEP/EEA Guidebook.

3. AGRICULTURE

- 3B1a, 3B1b, 3B2, 3B3, 3B4a, 3B4d, 3B4e, 3B4g(i-iv), 3Da1, 3Da2a, 3Da3, 3Dc, 3De: Tier 1 method, EMEP/EEA Guidebook

2. INDUSTRIAL PROCESSES AND PRODUCT USE

- 2A1, 2A2, 2A3, 2A5a, 2B1, 2B2, 2C1, 2C2, 2D3a, 2D3b, 2D3d, 2H1, 2I, 2K: Tier 1 method, EMEP/EEA Guidebook
- 2A6: National Methodology for emission calculation from concrete and brick production.
- 2B10a, 2C3, 2C5, 2H2: Tier 2 method, EMEP/EEA Guidebook.

4. WASTE

- 5A, 5D1, 5D2: Tier 1 method, EMEP/EEA Guidebook.
- 5C1b(i,iii): Tier 1 and 3 (plant specific emissions from state reporting system) method, EMEP/EEA Guidebook.

Improvement of Air Emission Inventory and Projection in 2020

Inventory

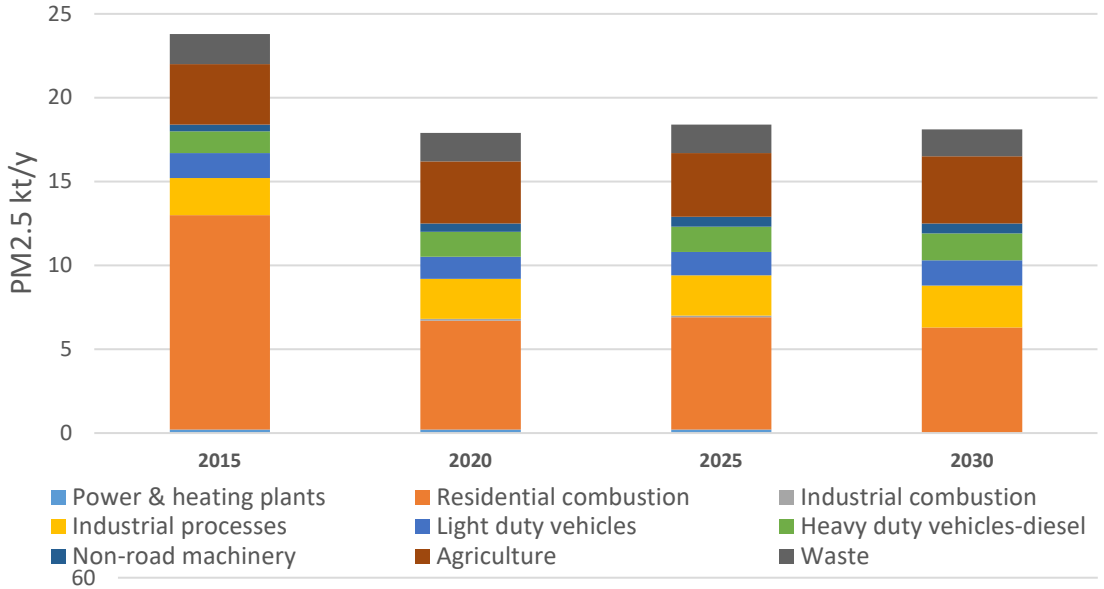
- Time period required by international obligations fully covered
- Methodology for inventory fully in line with EMEP/EEA Guidebook 2019
- In total inventory implemented for 62 subcategory

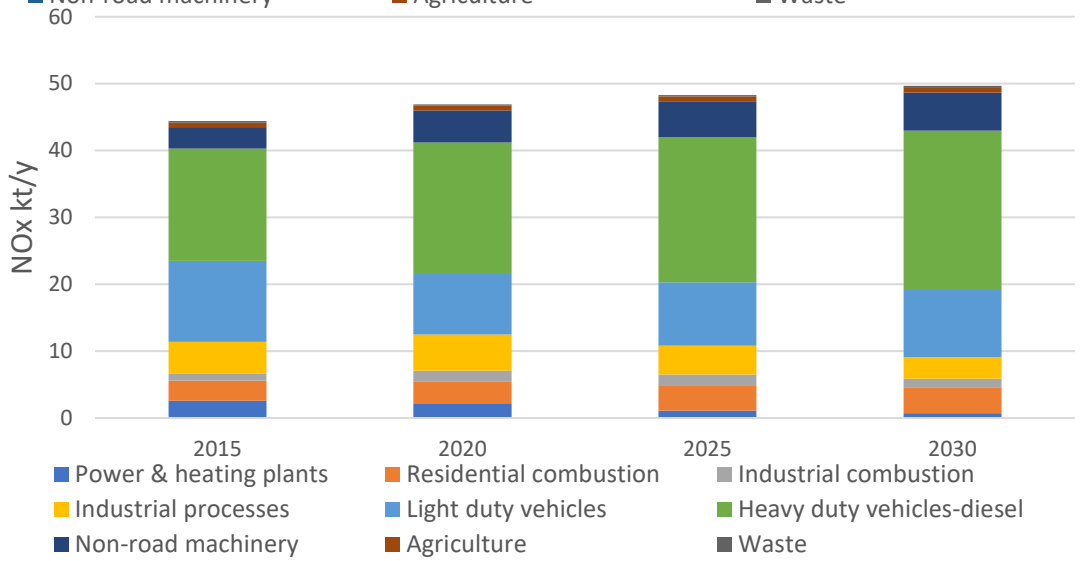
Projection

- Emission projections for 2020, 2025 and 2030
- International obligation under CLRTAP implemented
- Efficiency of emission abatement measures and its prioritization assessed

Sida
SWEDISH INTERNATIONAL DEVELOPMENT COOPERATION AGENCY

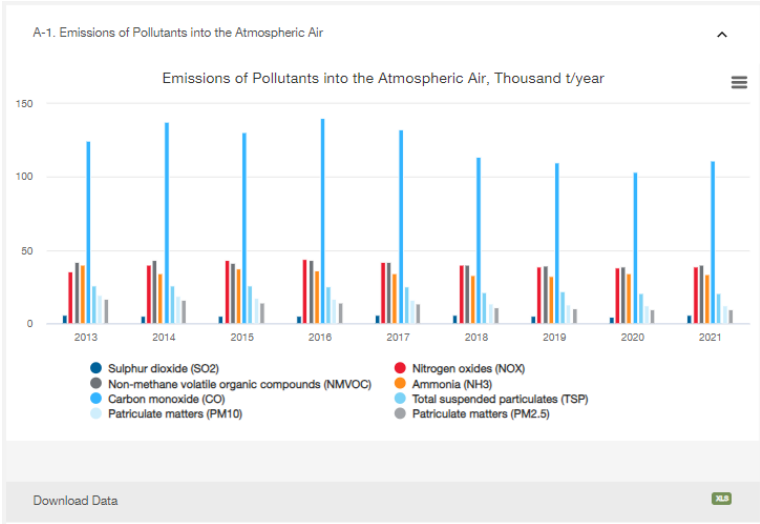
UNDP





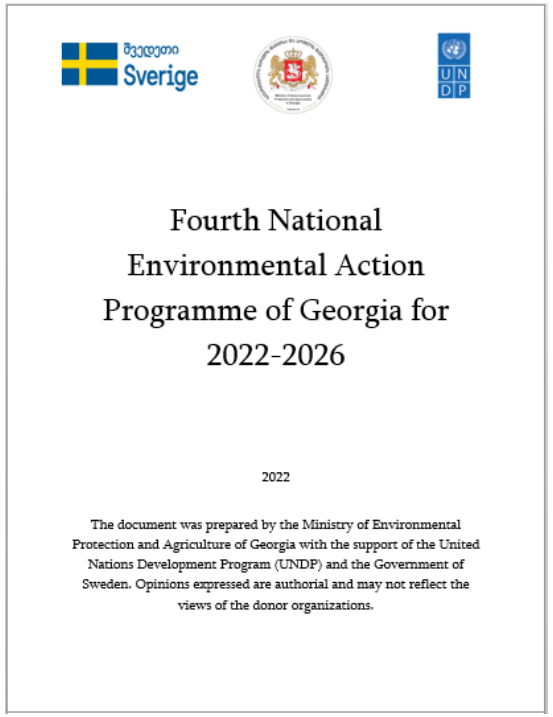
Use of Emission Inventory and Projection Data

A-1. Emissions of pollutants into the atmospheric air - **UNECE environmental indicators at** geostat.ge

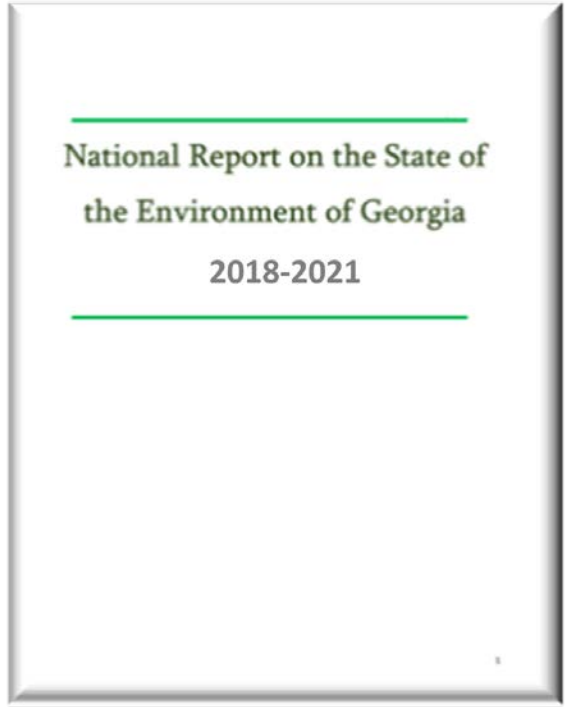


Indicator	Baseline, 2020	Target, 2026
The ratio of the amount of nitrogen dioxide emissions from the transport sector to the number of registered vehicles	14.2 ton/1000 vehicles	12.3 ton/ 1000 vehicles
The ratio of the amount of PM2.5 emissions from the transport sector to the number of registered vehicles	0.55 ton/1000 vehicles	0.47 ton/1000 vehicles
Amount of sulfur dioxide emissions from energy, industry and transport sectors	4.5 kt	4 kt

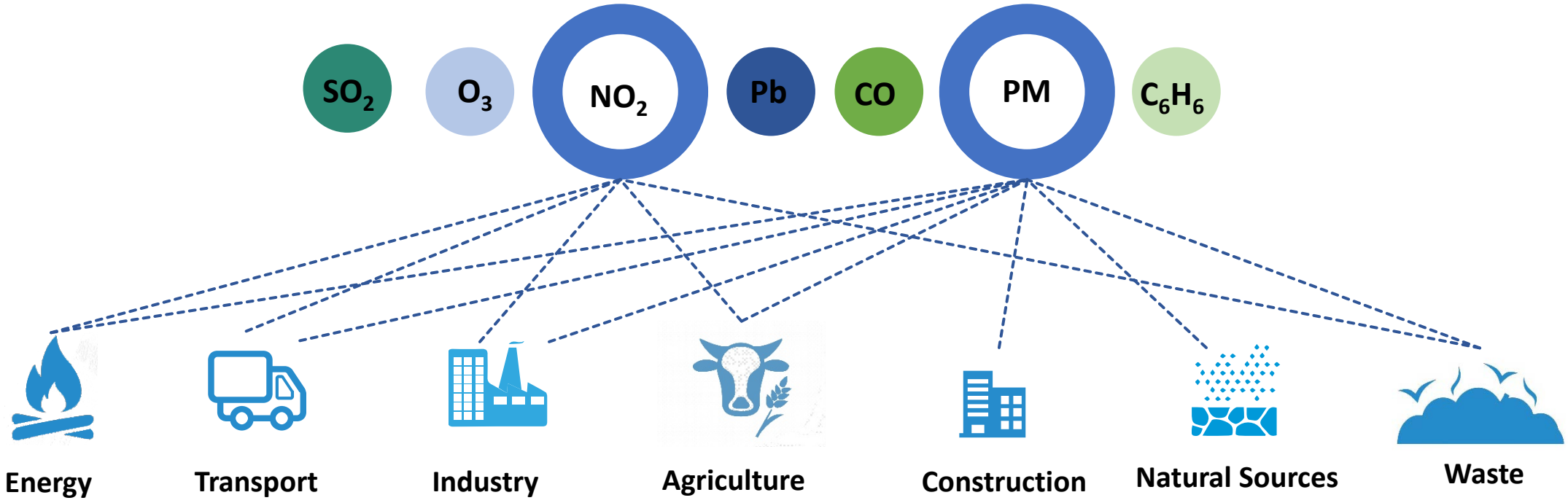
National Environmental Action Programme - mepa.gov.ge



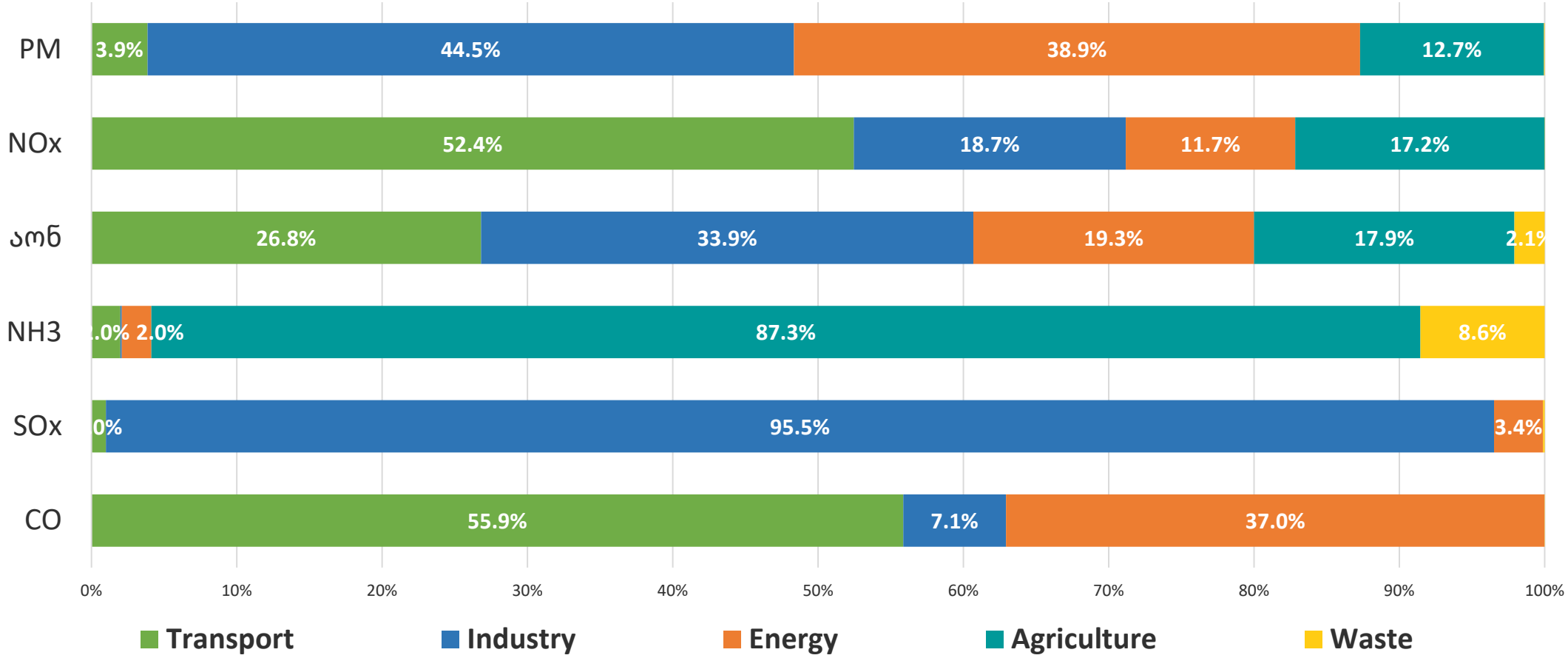
State of Environment Report - mepa.gov.ge



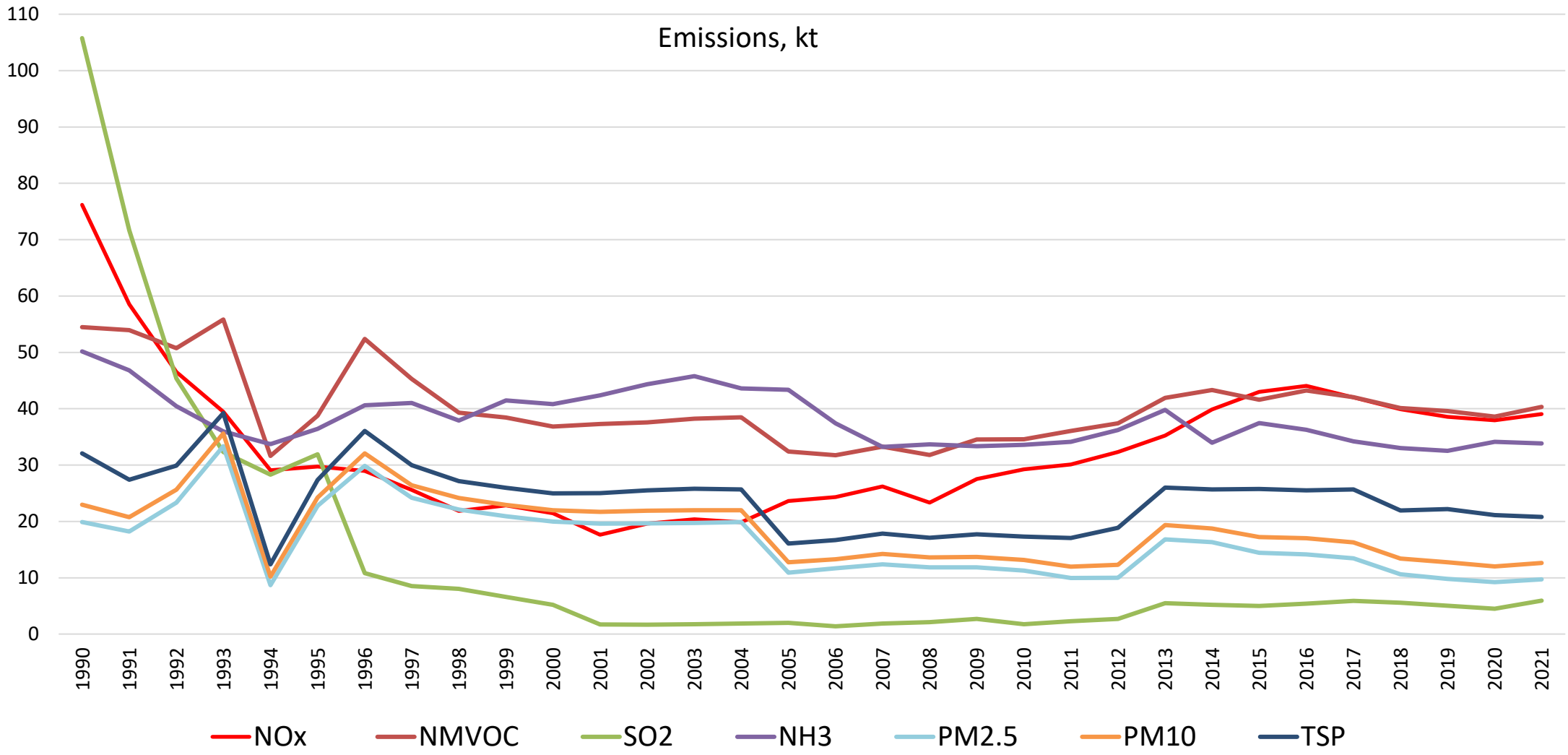
Challenging Pollutants in Georgia



Main Sources of Pollution Based on Inventory

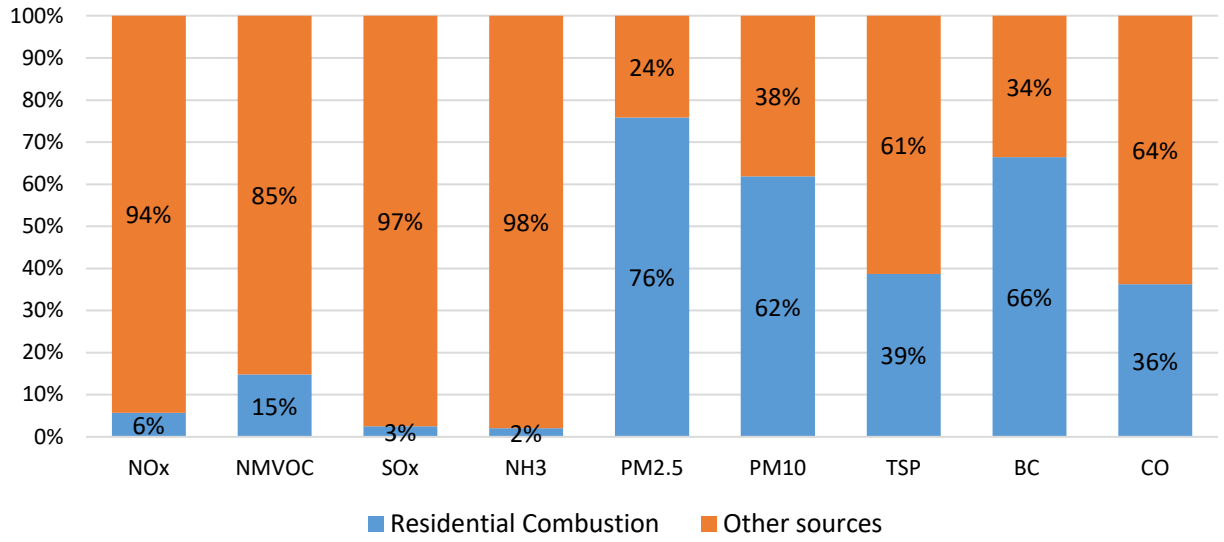


Emission Trend of Main Pollutants



Key Challenges

- Lack of baseline data on stoves in **households** to apply Tier 2 method
- Lack of baseline data on areas where **agricultural residue** and other waste are burn;
- lack of baseline data and human resources to use COPERT for the estimation of air emissions from **transport**;
- Lack of aggregated data on **construction** sector to apply at least Tier 1;



Share of emissions from residential combustion in total emissions in 2021

Ambient Air Quality Monitoring Network

2016
3 monitoring stations installed in Tbilisi
Passive samplings in 16 cities

2017
2 New stations in Batumi and Kutaisi
Passive samplings in 20 cities

2018
First automatic mobile station
Passive samplings in 25 cities

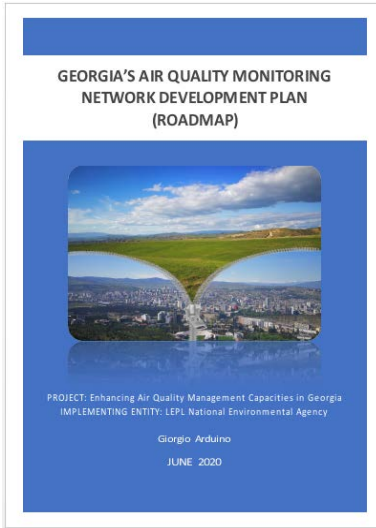
2019
2 new stations in Tbilisi and Rustavi
Passive samplings in 25 cities

2020
New Division for AQM and Tech. Maintenance
AQM Network Development Plan
Passive samplings in 25 cities

2021
Introduction of modelling system
3 gravimetric equipment
Passive samplings in 25 cities

2022
New mobile automatic station
Passive samplings in 25 cities

2023
8 stationary and 1 mobile stations
4 gravimetric equipment
Passive samplings in 30 cities



List of Monitored Substances

Stations	Passive Samplings	Gravimetric Equipments
PM10, PM2.5 – Particulate Matters	NO_2 – Nitrogen Dioxide	Cd - Cadmium
NOx – Nitrogen Oxides	O_3 - Ozone	Ni - Nikel
SO_2 – Sulphur Dioxide	C_6H_6 - Benzene	As - Arsenic
O_3 - Ozone		$C_{20}H_{12}$ - Benzo(a)pyrene
CO – Carbon Monoxide		Pb – Lead
TSP, MnO_2 – Manganese Dioxide (non-automatic)		

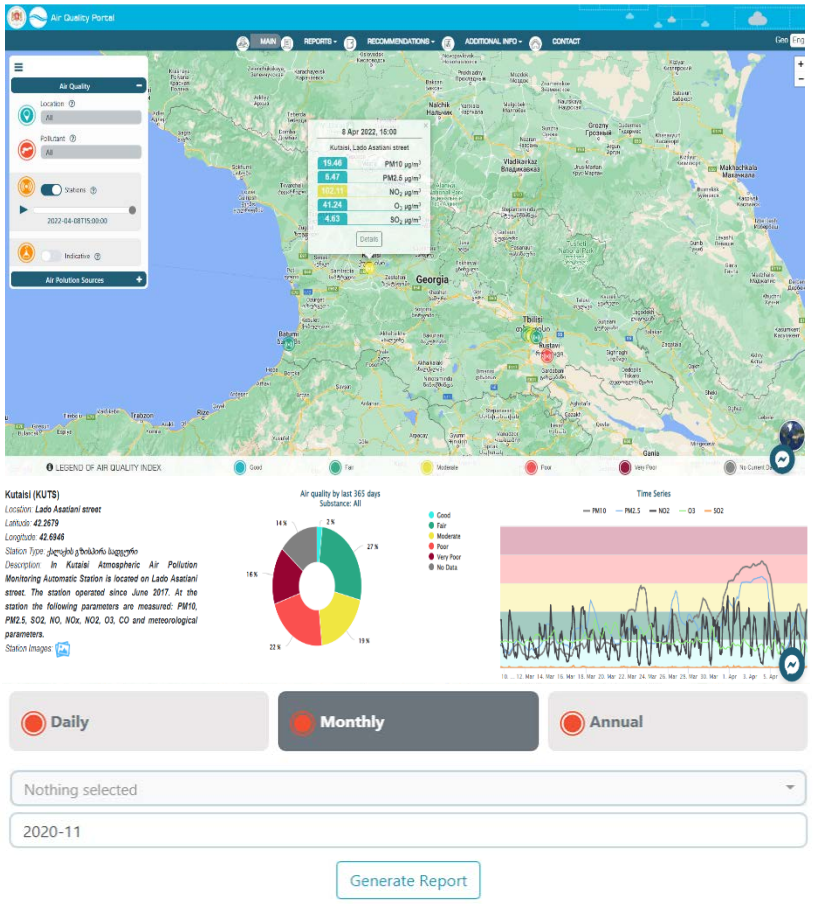
Zones & Agglomerations	Population	n° St. today	Min n° St.	NOx	SOx	CO	O3	PM10 & PM2,5	Lead, HMet, BaP	BTX	Optim n° St.
Agglomeration of Tbilisi	1.108.717	4	5	5	3	4	3	5	5	2	6
Black Sea Zone	635.480	1	4	5	3	3	5	5	5	1	5
West Zone	431.834	1	3	4	1	2	3	4	3	1	4
Central Zone	743.019	1	4	5	2	2	3	5	5	1	5
East Zone	287.122	0	2	2	1	1	2	2	2	1	3
High Zone	806.494	0	3	3	1	1	3	3	3	0	5
	4.012.666	7	21	24	11	13	19	24	23	6	28

Monitoring Data Availability

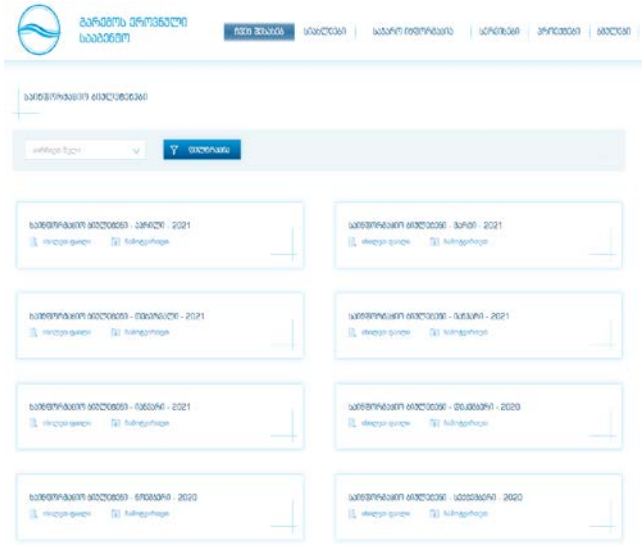
Stations	Pollutants	Period
Tbilisi, Varketili (automatic+gravimetric)	PM10, PM2.5, NO_2, SO_2, CO, O_3 Cd, Ni, As, Pb, $C_{20}H_{12}$	2017-2023 2023-
Tbilisi, Tsereteli Av. (automatic+gravimetric)	PM10, PM2.5, NO_2, SO_2, CO, O_3 Cd, Ni, As, Pb, $C_{20}H_{12}$	2017-2023 2022-2023
Tbilisi, Kazbegi Av. (automatic+gravimetric)	PM10, PM2.5, NO_2, SO_2, CO, O_3 Cd, Ni, As, Pb, $C_{20}H_{12}$	2017-2023 2023-
Tbilisi, Ilia's Garden (automatic+gravimetric)	PM10, PM2.5, NO_2, SO_2, CO, O_3 Cd, Ni, As, Pb, $C_{20}H_{12}$	2017-2023 2022-2023
Rustavi, Batumi str. (automatic+gravimetric)	PM10, PM2.5, NO_2, SO_2, CO, O_3 Cd, Ni, As, Pb, $C_{20}H_{12}$	2017-2023 2023-
Batumi, Abuseridze str. (automatic+gravimetric)	PM10, PM2.5, NO_2, SO_2, CO, O_3 Cd, Ni, As, Pb, $C_{20}H_{12}$	2017-2023 2023-
Kutaisi, Asatiani str. (automatic+gravimetric)	PM10, PM2.5, NO_2, SO_2, CO, O_3 Cd, Ni, As, Pb, $C_{20}H_{12}$	2017-2023 2023-
Zestaponi (non-automatic)	TSP, MnO_2, NO_2, SO_2, CO	2013-2023
Passive Sampling on 30 cities	NO_2 – Nitrogen Dioxide	2015-2023
Passive Sampling on 29 cities	O_3 – Ozone	2015-2023
Passive Sampling on 13 cities	C_6H_6 - Benzene	2015-2023

Public Access to Ambient Air Quality Data

Air Quality Portal - Air.gov.ge

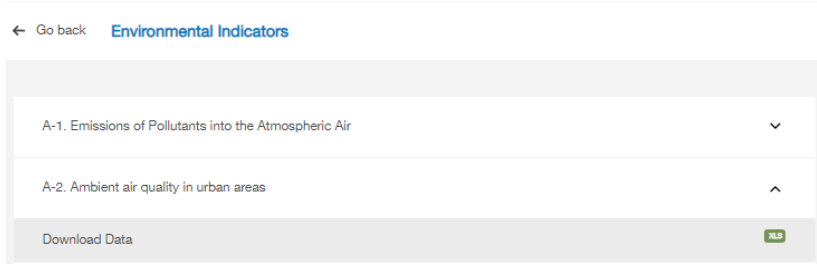


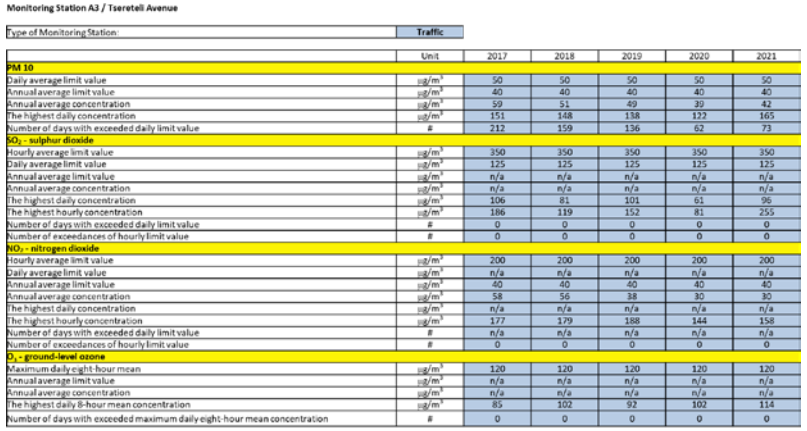
Monthly&Annual Bulletins - Nea.gov.ge



State of Environment Report - mepa.gov.ge

A-2. Ambient air quality in urban areas - **UNECE environmental indicators at geostat.ge**





Monitoring Station A3 / Tsereteli Avenue

Type of Monitoring Station: Traffic

	Unit	2017	2018	2019	2020	2021
PM 10						
Daily average limit value	µg/m³	50	50	50	50	50
Annual average limit value	µg/m³	40	40	40	40	40
Annual average concentration	µg/m³	59	51	49	39	42
The highest daily concentration	µg/m³	151	148	138	122	165
Number of days with exceeded daily limit value	#	212	159	136	62	73
SO_2 - sulphur dioxide						
Hourly average limit value	µg/m³	350	350	350	350	350
Daily average limit value	µg/m³	125	125	125	125	125
Annual average limit value	µg/m³	n/a	n/a	n/a	n/a	n/a
Annual average concentration	µg/m³	n/a	n/a	n/a	n/a	n/a
The highest daily concentration	µg/m³	106	81	101	61	96
The highest hourly concentration	µg/m³	186	119	152	81	255
Number of days with exceeded daily limit value	#	0	0	0	0	0
Number of exceedances of hourly limit value	#	0	0	0	0	0
NO_2 - nitrogen dioxide						
Hourly average limit value	µg/m³	200	200	200	200	200
Daily average limit value	µg/m³	n/a	n/a	n/a	n/a	n/a
Annual average limit value	µg/m³	40	40	40	40	40
Annual average concentration	µg/m³	58	56	38	30	30
The highest daily concentration	µg/m³	n/a	n/a	n/a	n/a	n/a
The highest hourly concentration	µg/m³	177	179	188	144	158
Number of days with exceeded daily limit value	#	n/a	n/a	n/a	n/a	n/a
Number of exceedances of hourly limit value	#	0	0	0	0	0
O_3 - ground-level ozone						
Maximum daily eight-hour mean	µg/m³	120	120	120	120	120
Annual average limit value	µg/m³	n/a	n/a	n/a	n/a	n/a
Annual average concentration	µg/m³	n/a	n/a	n/a	n/a	n/a
The highest daily 8-hour mean concentration	µg/m³	85	102	92	102	114
Number of days with exceeded maximum daily eight-hour mean concentration	#	0	0	0	0	0

Thank you!

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