Ministry of Environmental Protection

The State of the Environment in Israel: Selected Indicators

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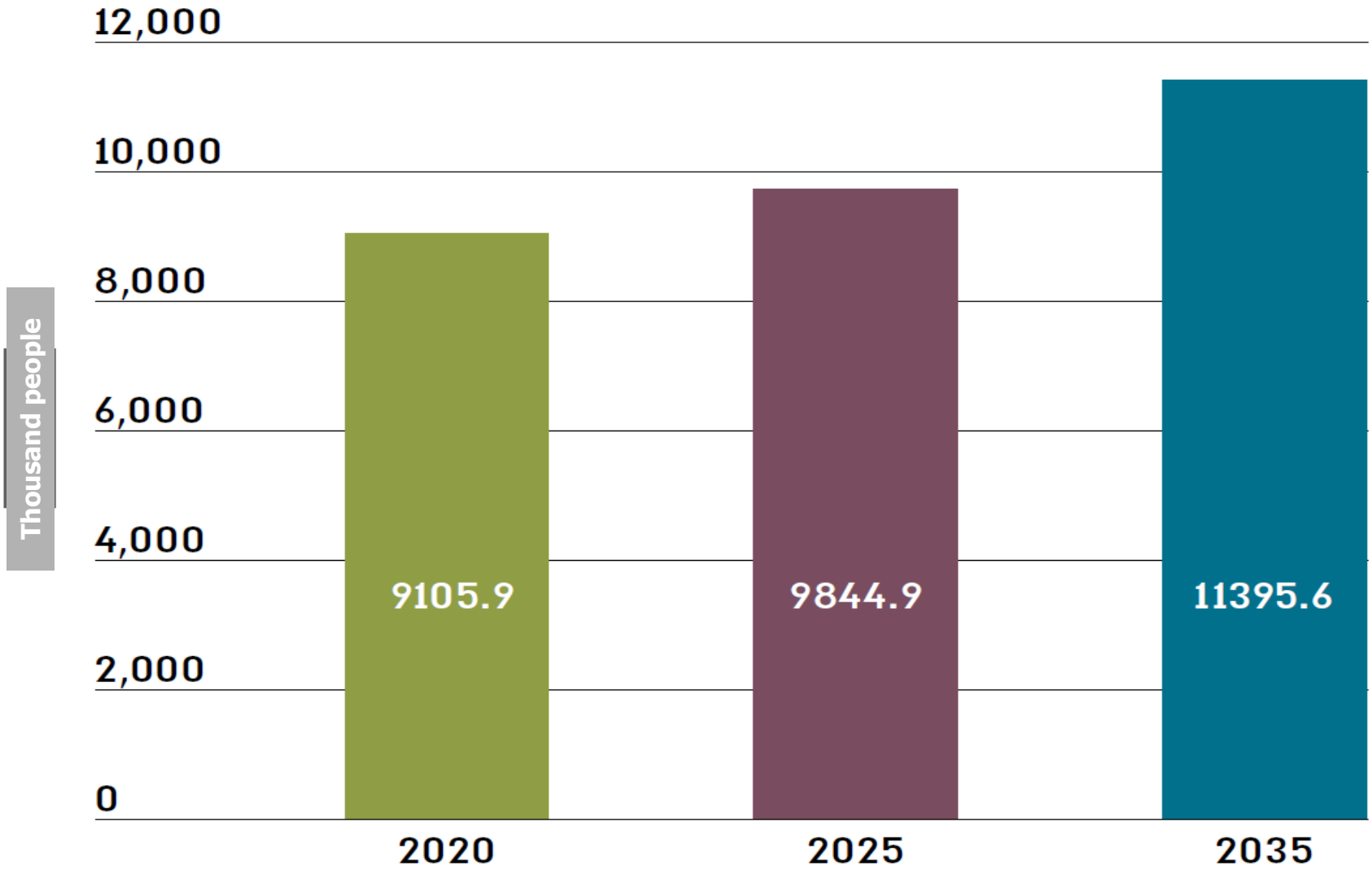
EEA – UNEP – IMOEP – ICBS Meeting – SEIS Program
Jerusalem, March 2018

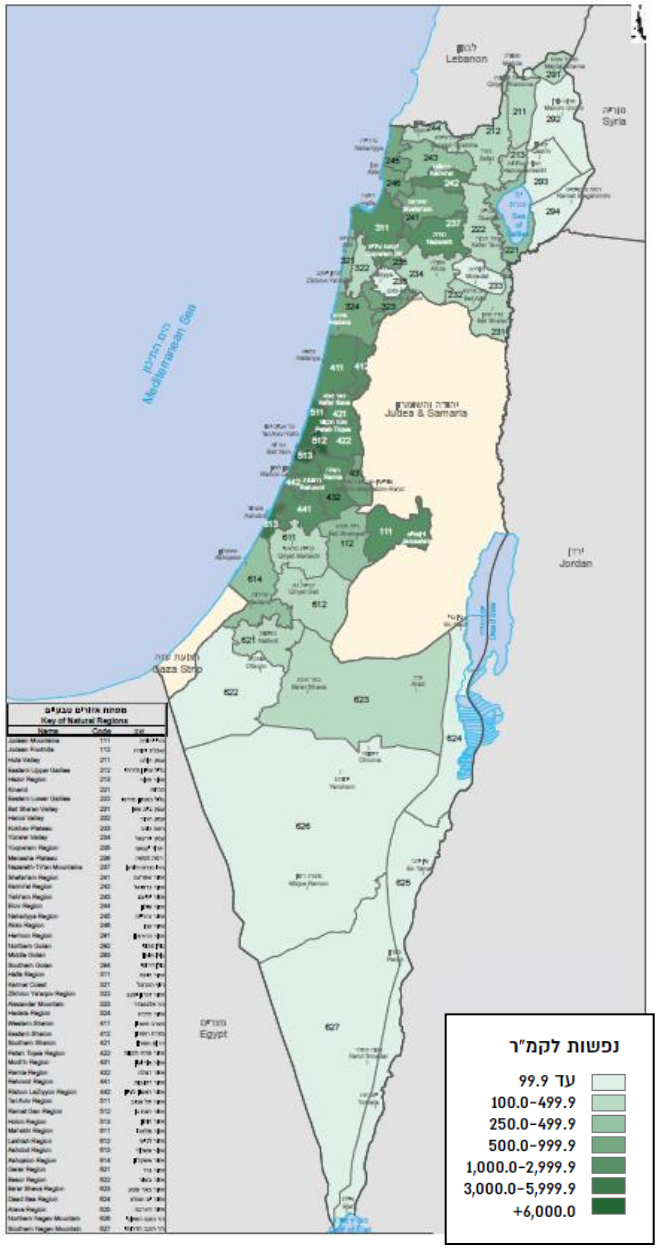
Population: forecasts for years 2020, 2025, 2035



Population Density in Israel by District, 2014

- **The Tel Aviv District is the most densed district in the country (7,841.4 persons per square kilometer).**

- **The density in the Southern District is the lowest in years.**



Changes in recent years with a significant environmental impact

- Joining the **OECD** & hence adapting new environmental regulations + signatory to numerous international **conventions/agreements**
- Discovering the **sea** and its natural resources

  (gas, water for desalination, fish cages, corridors of infrastructures, deepening ports, etc.)
- Increasing quantities of **waste** (…increase in consumption of goods)

Changes in recent years with a significant environmental impact

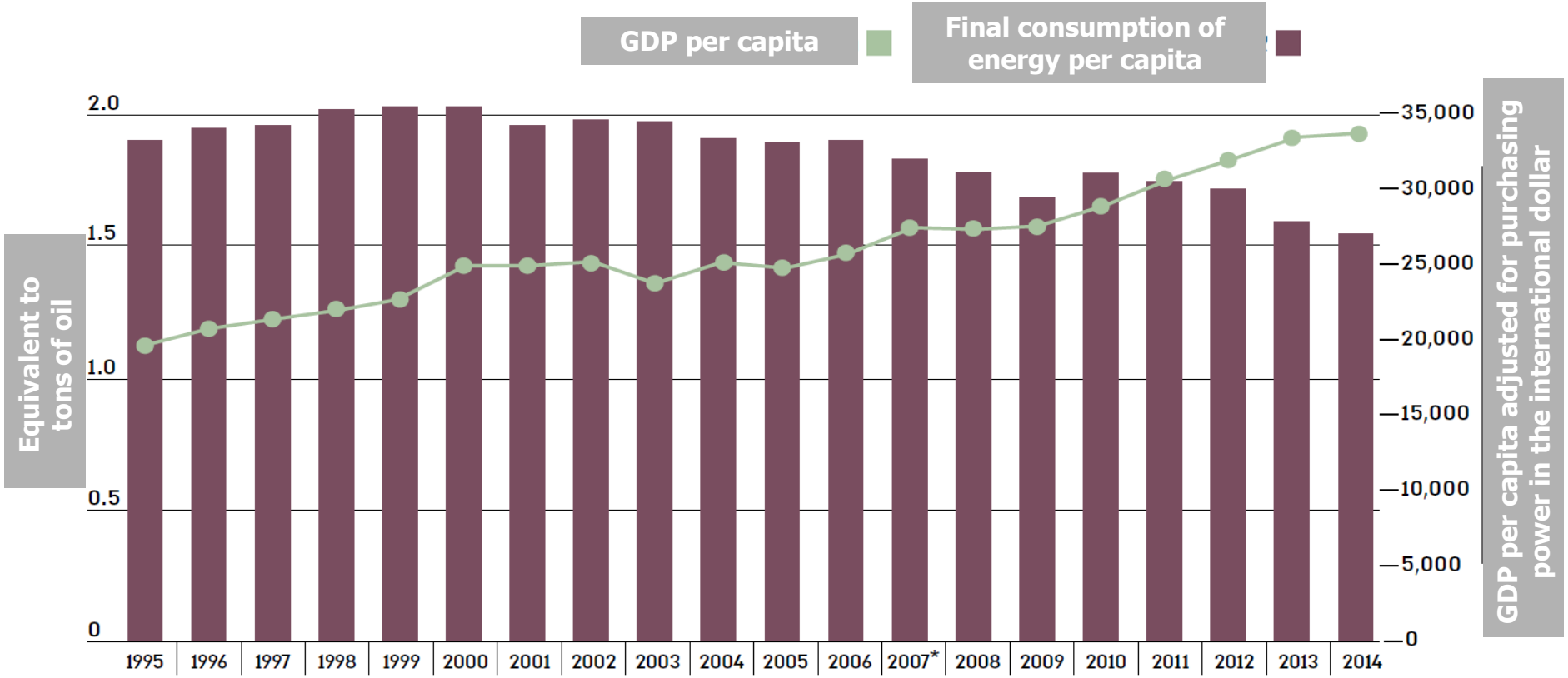
- Striving for **independence** in:
  - Water production (desalination and WWT&R)
  - Energy production (natural gas)
  - Alternative fuels for transportation

- Increasing **land use** conflicts & an urgent need to increase the stock of apartments & hence infrastructure.

Decoupling economic growth from energy consumption?

Final consumption of energy per capita and per capita GDP, 1995-2014

- In 1995-2000, there was an increase in per capita energy consumption in Israel.
- Starting in the year 2000, the final consumption of energy per capita is on a downward trend, which may reflect an improvement in the efficiency of energy use in Israel.

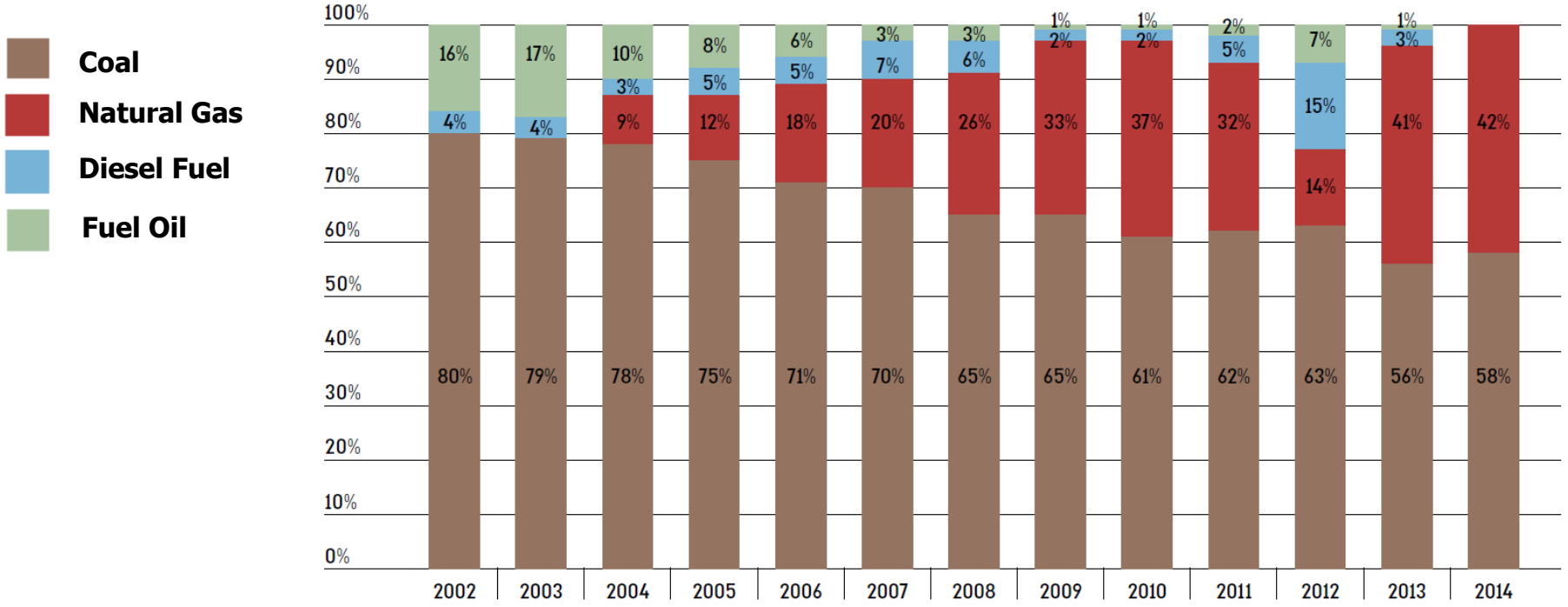


Air pollution reduction due to increased use of natural gas

- Increased use of natural gas for electricity generation (reducing use of coal/diesel fuel/mazut)
- Implementation of reduction measures initiated by MOEP
- Significant reduction in emissions of nitrogen oxides, sulfur oxides and carbon dioxide from power plants and industry (last 4 years, up to 2016)
- The amount of carbon dioxide emissions in electricity generation did not decline further in 2015-16 despite increased use in natural gas due to a 10% rise in electricity production in the last two years.

Distribution of Types of Fuels for Electricity Generation in the Israel Electric Corporation, 2002-2014

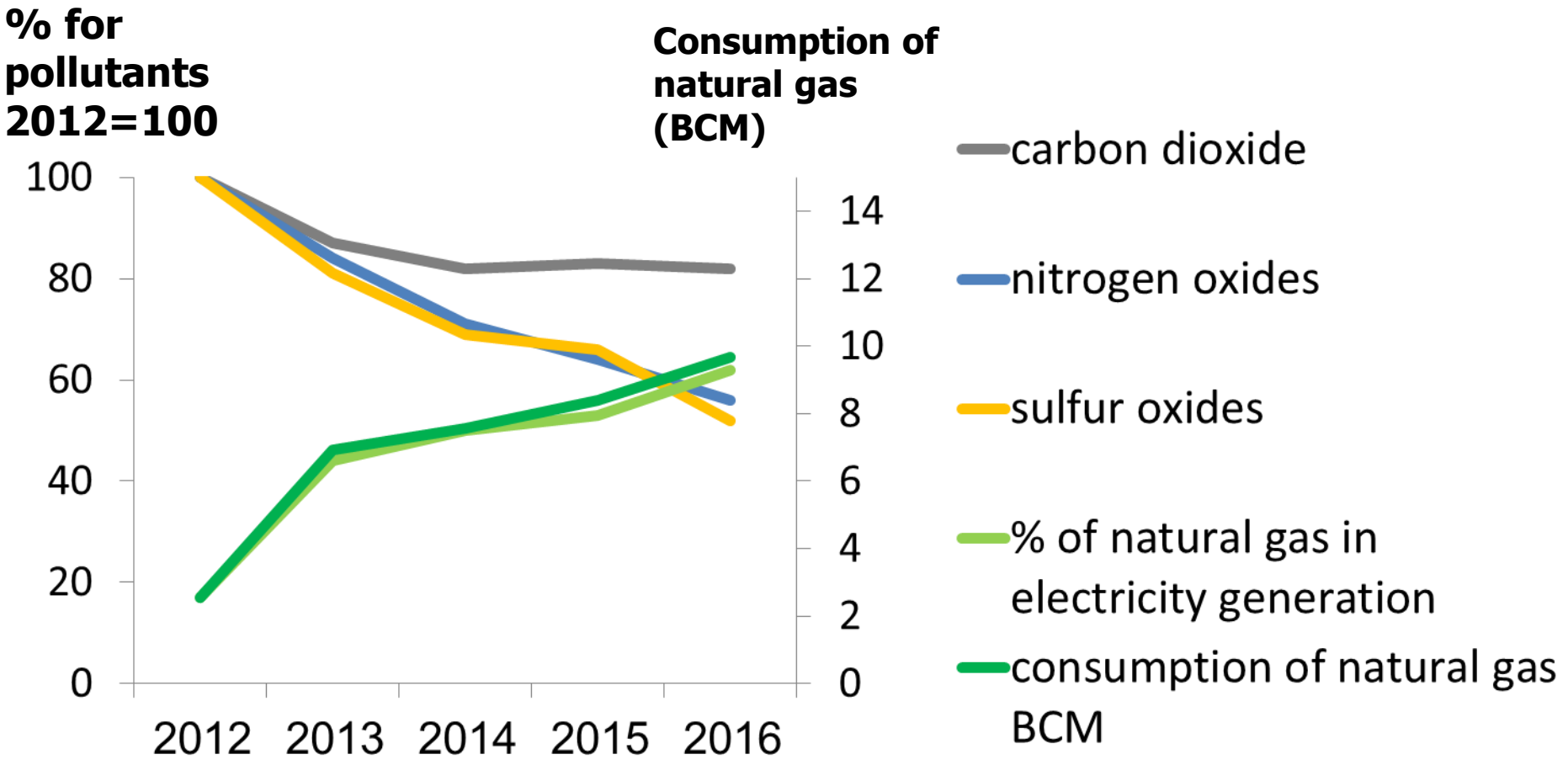
- The use of coal and fuel oil decreases and the use of natural gas increases.
- The use of natural gas in EG increased significantly in 2013 (41%) and 2014 (42%), with "Tamar" field starting to pump gas (April 2013)



Source of Data: Statistical Report, 2011-2014, Israel Electric Corporation

PRTR -
Pollutant Release and Transfer Register

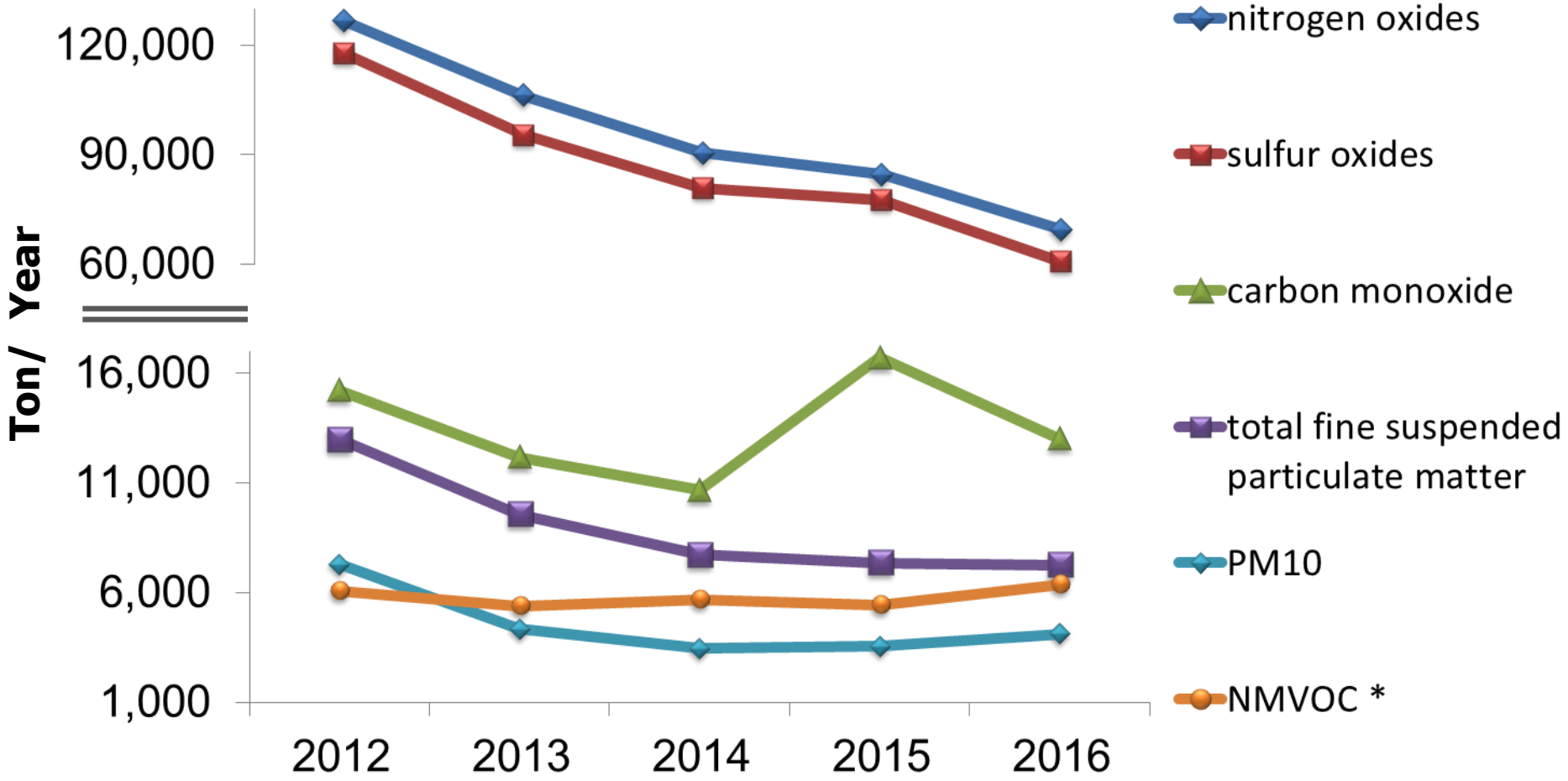
Air pollution reduction due to increased use of natural gas (PRTR)



Source of natural gas consumption data: Reports of the Natural Gas Authority and the Electricity Authority for 2016

Source: Pollutant Release and Transfer Register, 2016

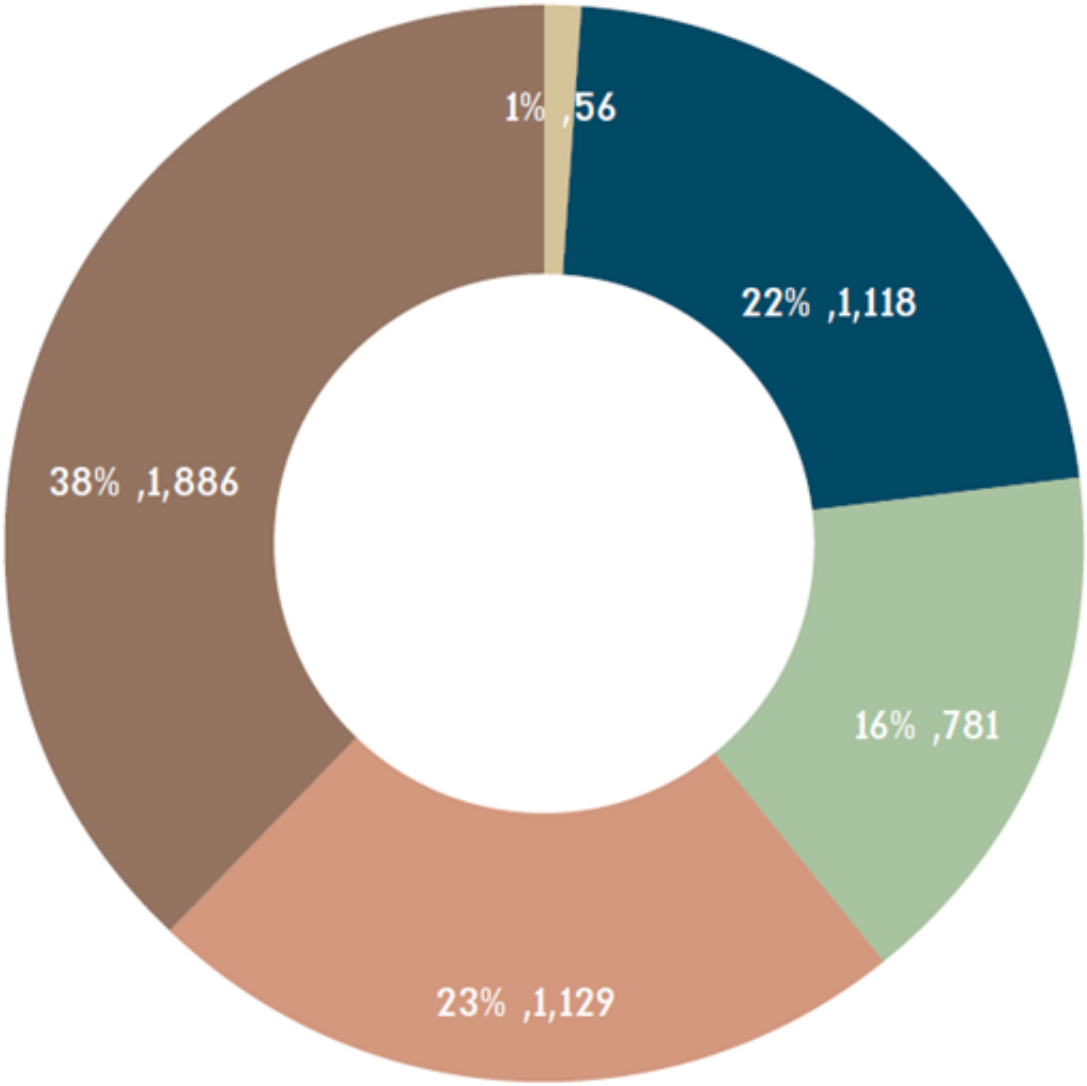
Trends in Air Emissions of Pollutants Emitted in Large Quantities according to PRTR (Pollutant Release and Transfer Register)



* Not including natural gas platforms of Noble Energy Mediterranean since they are located in the maritime space

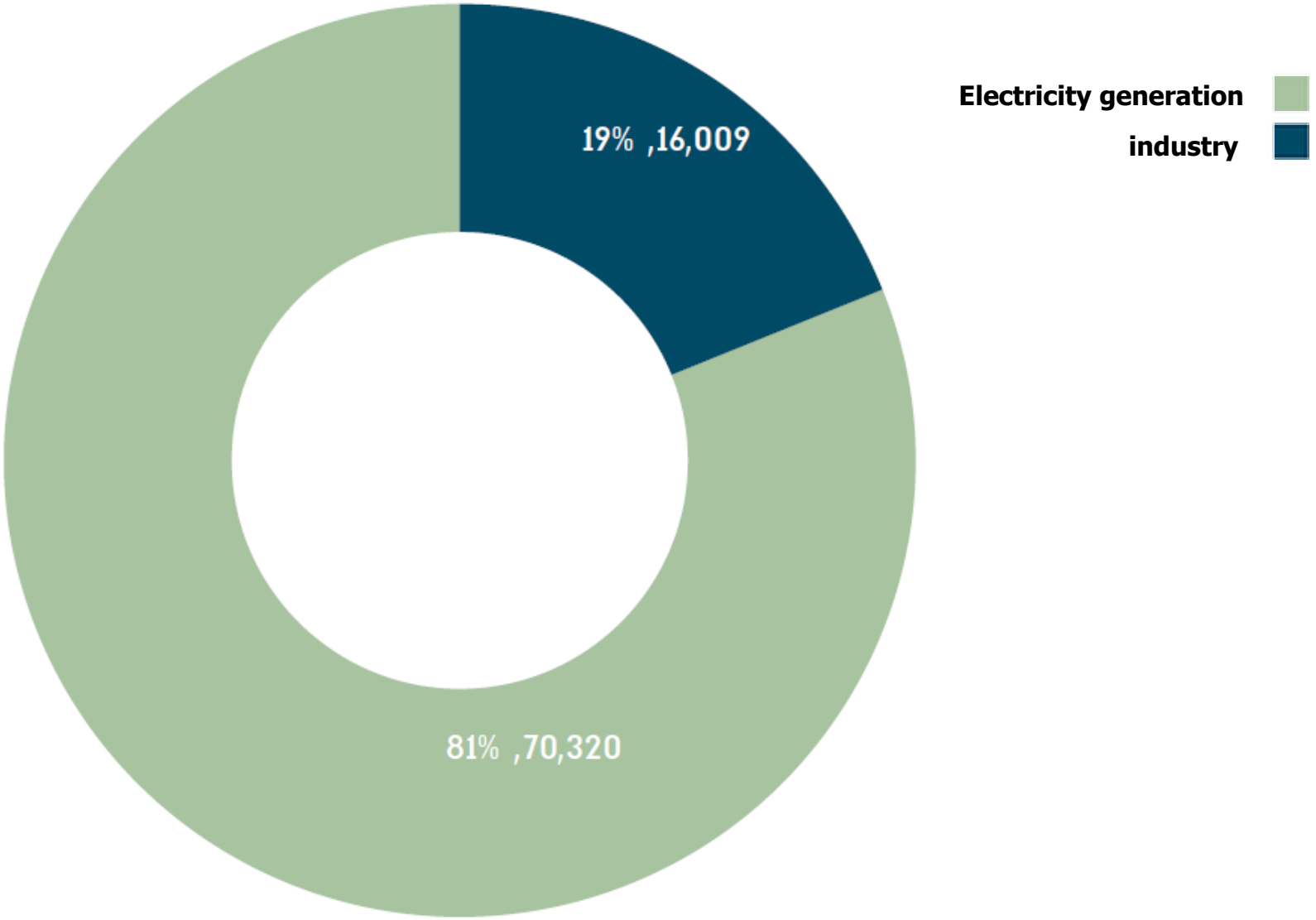
Source: Pollutant Release and Transfer Register, 2016

PM2.5, 2014 (ton/year)

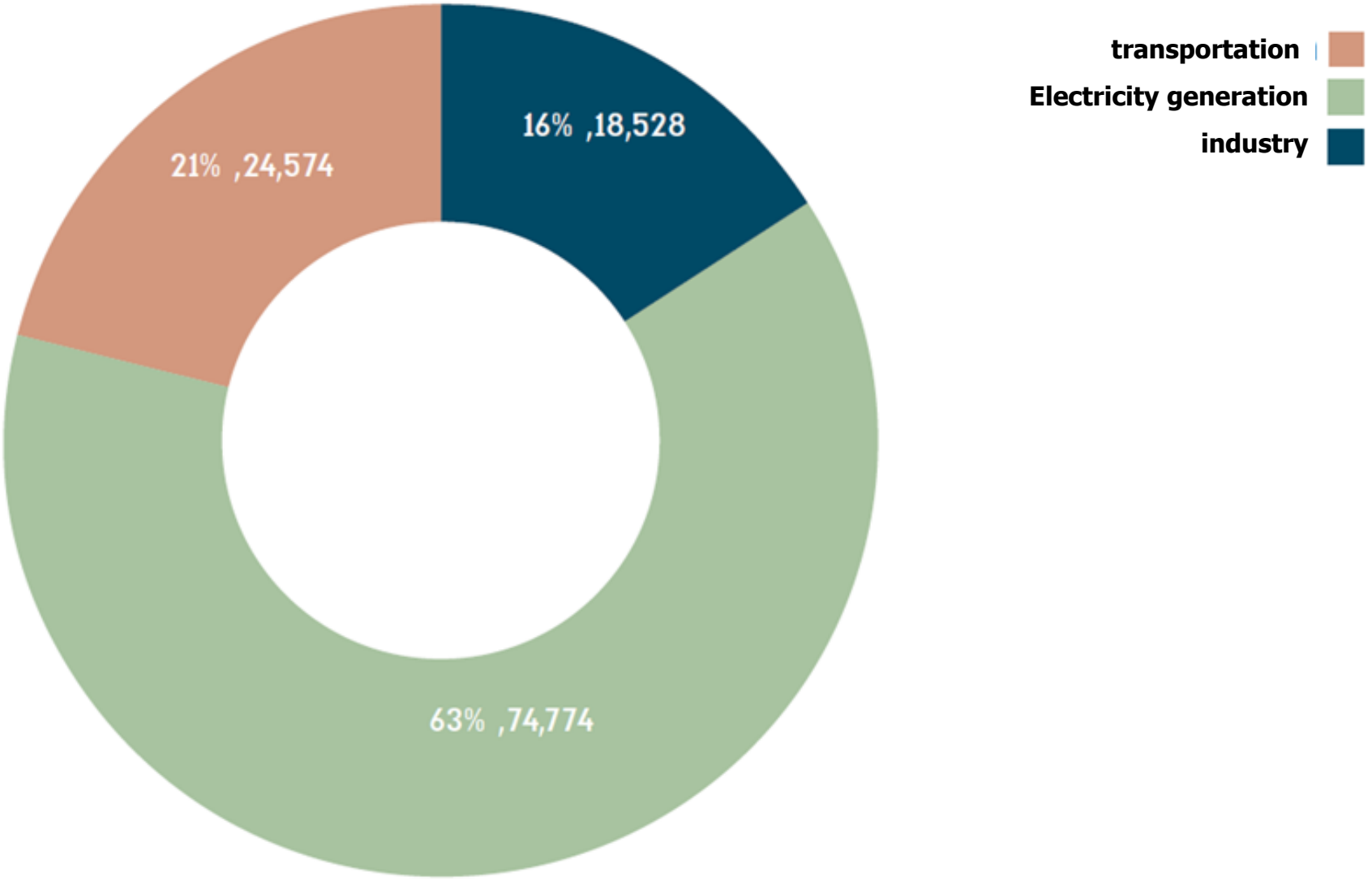


Burning of biomass waste
transportation
Electricity generation
industry
quarries

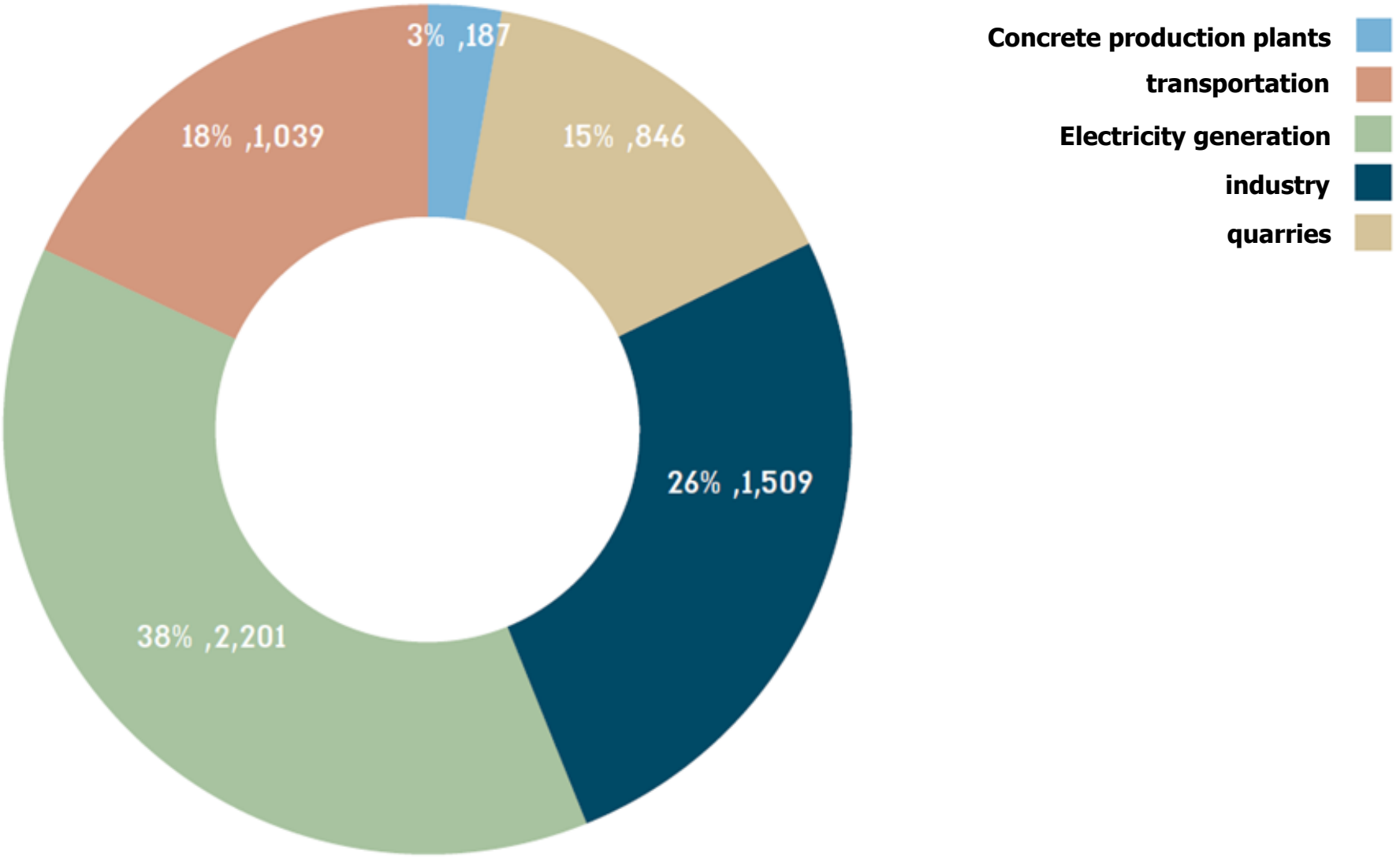
Sulfur Oxide (SOx), 2014 (ton/year)



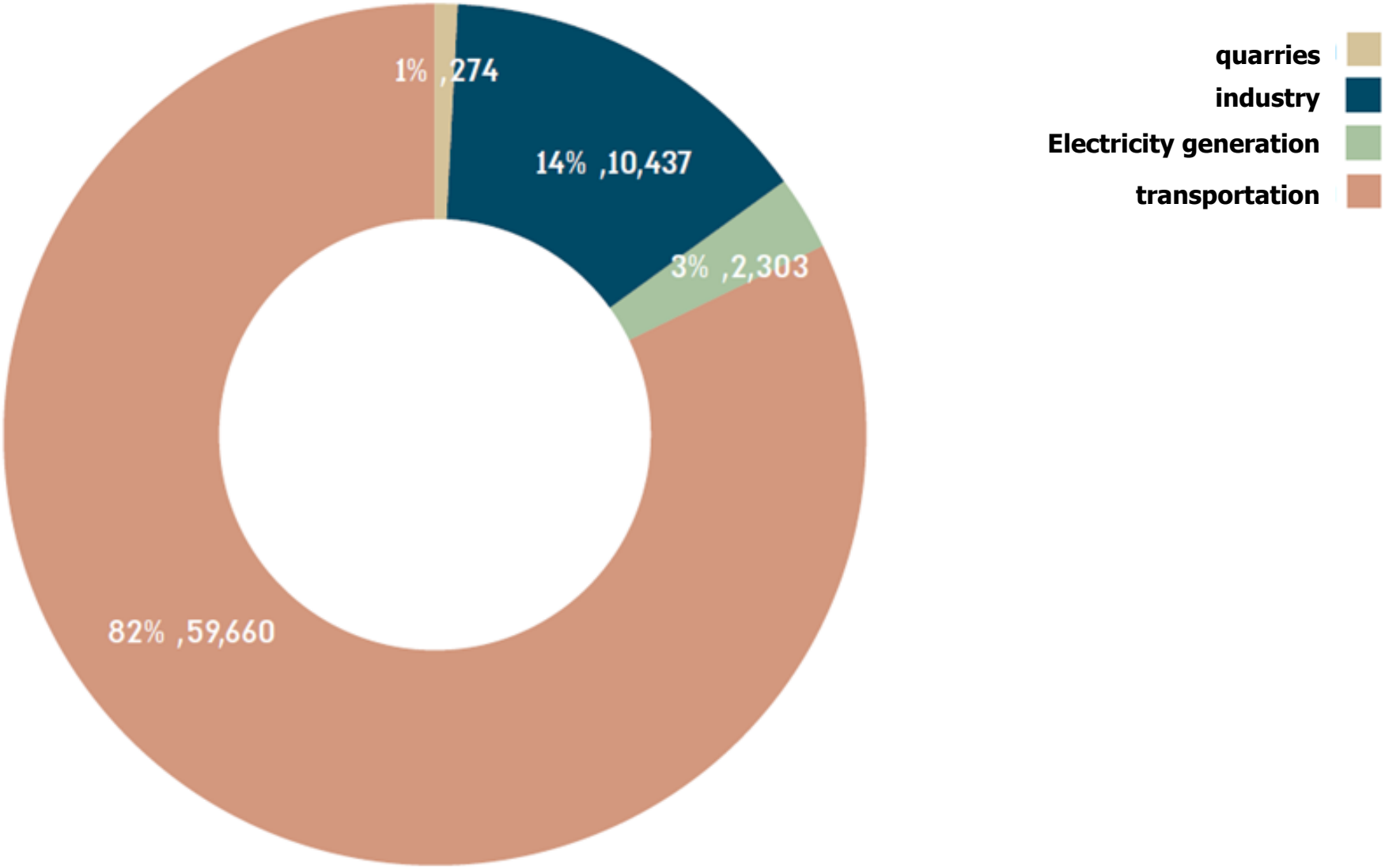
Nitrogen oxide (NOx), 2014 (ton/year)



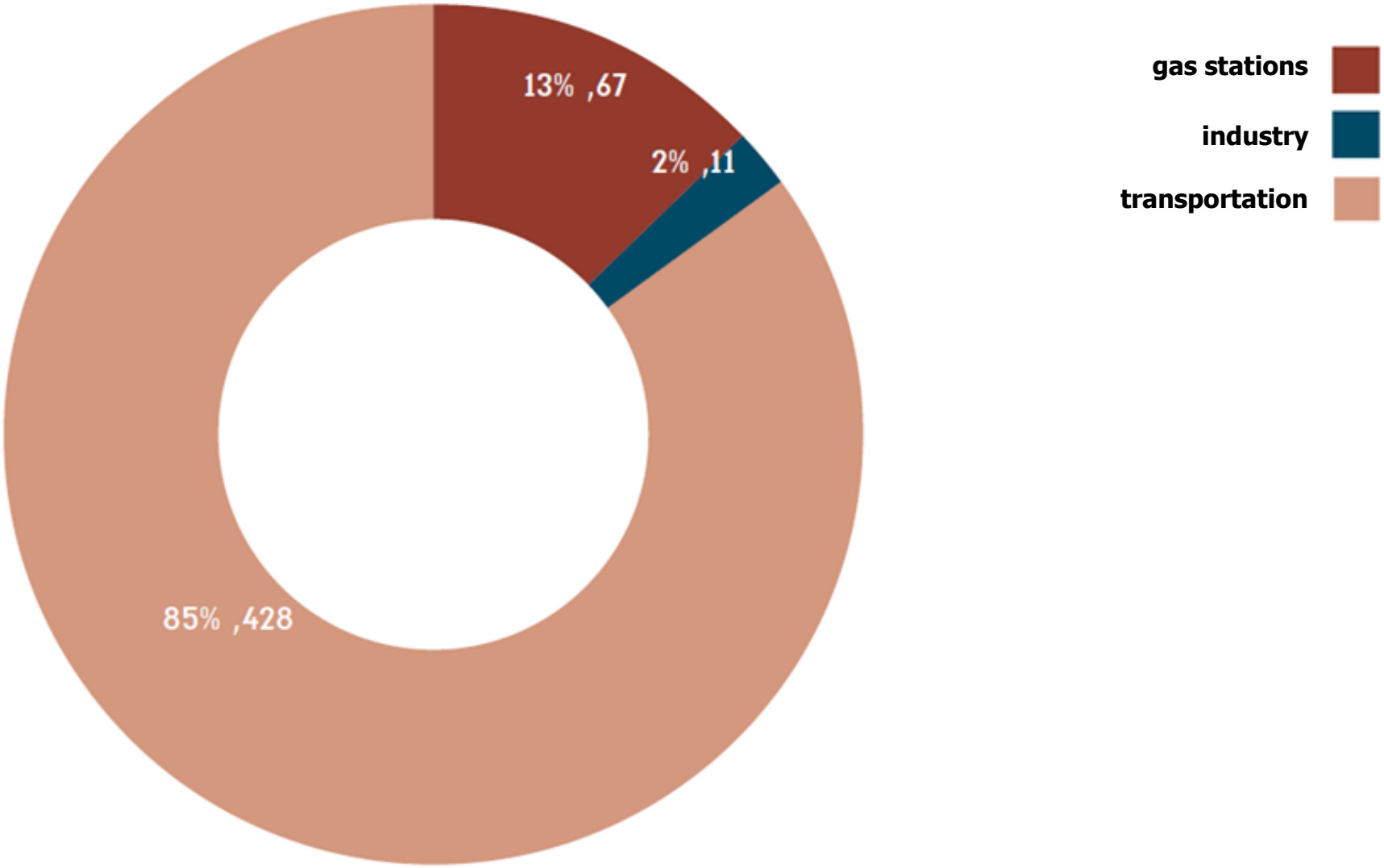
PM10, 2013 (ton/year)



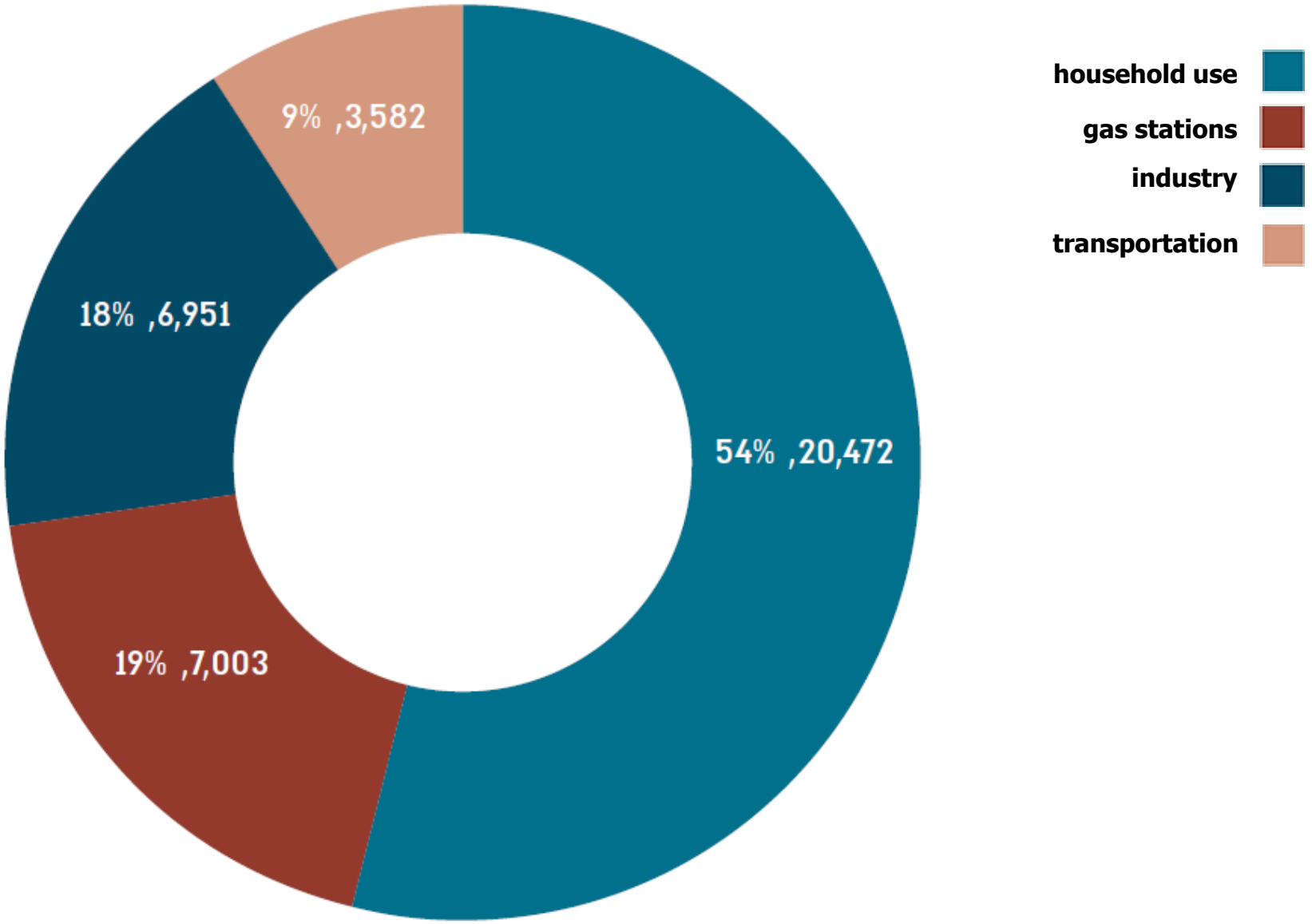
Carbon monoxide (CO), 2013 (ton/year)



Benzene, 2013 (ton/year)



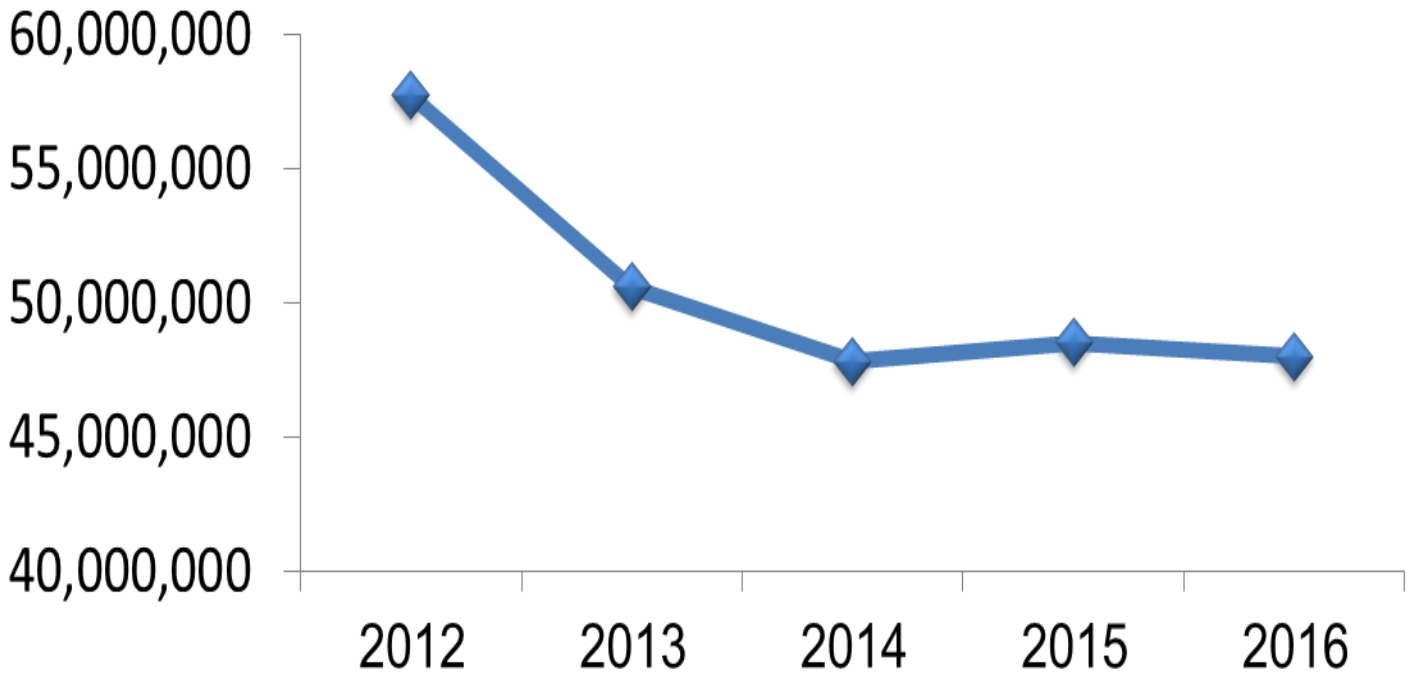
NMVOCs, 2014 (ton/year)



Greenhouse Gas Emissions

Since 2012 there has been a 17% decrease in GHG emissions (PRTR)

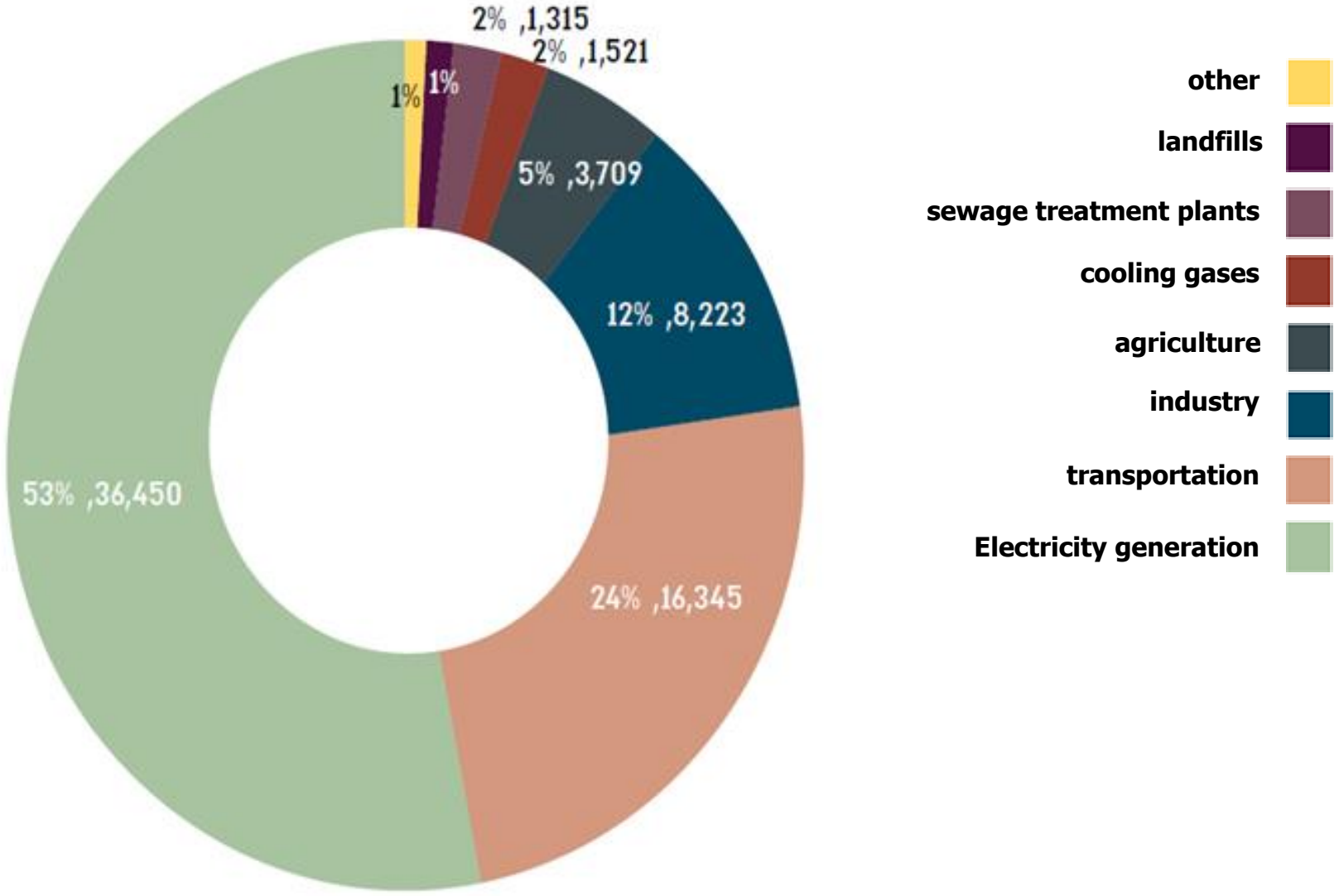
CO_2eq / year



Greenhouse gases include: carbon dioxide, methane, nitrous oxide, HFCs, PFCs, SF_6

Source: Pollutant Release and Transfer Register, 2016

Greenhouse Gases (equivalent to carbon dioxide), 2014 (thousand tons/year)



Air Quality Monitoring

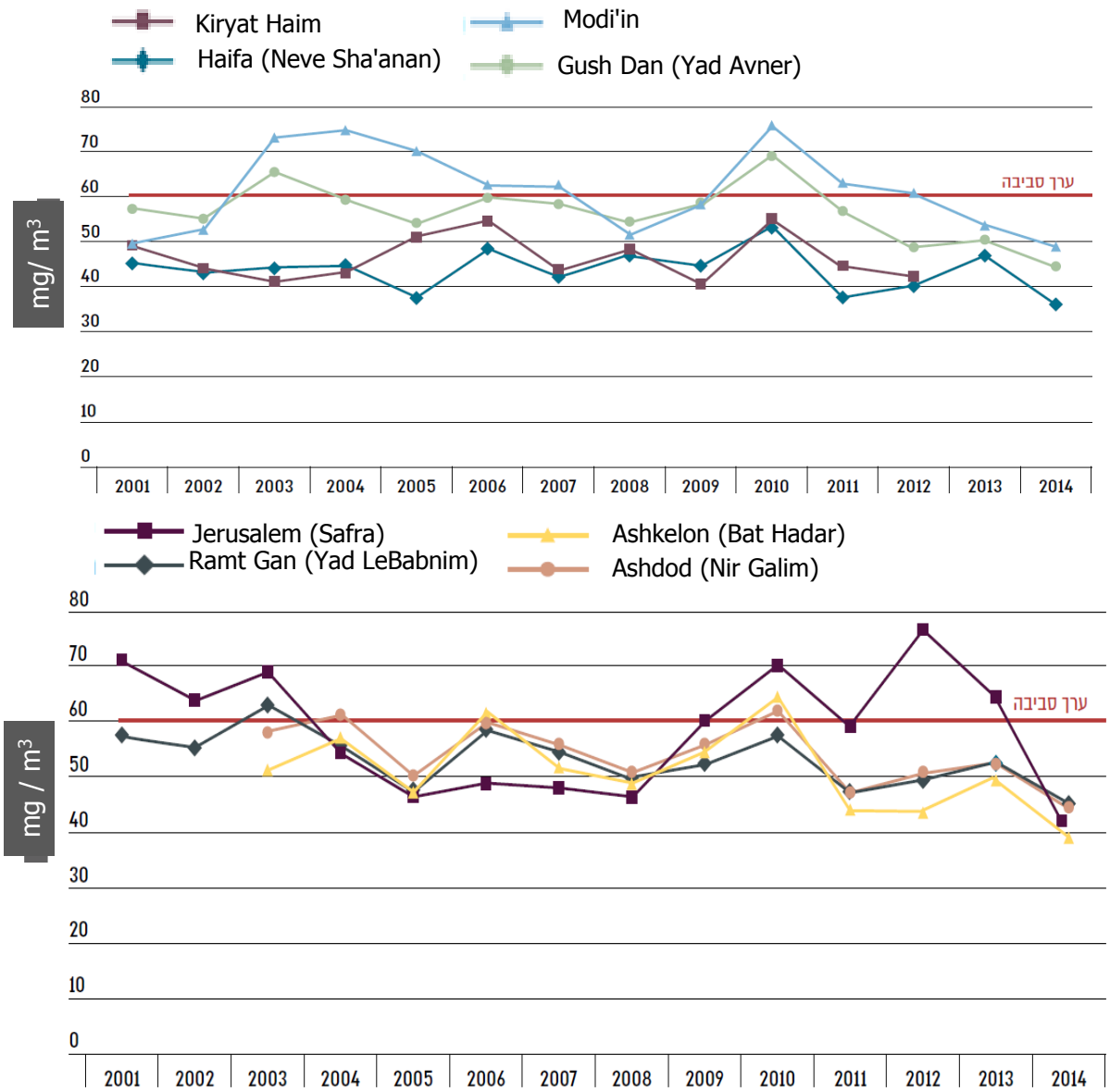
Concentration of PM_{10} at General Monitoring Stations - Annual averages, 2001-2014

What The Data Show:

* The general national trend is not significant when looking at the period between 2001 and 2014.

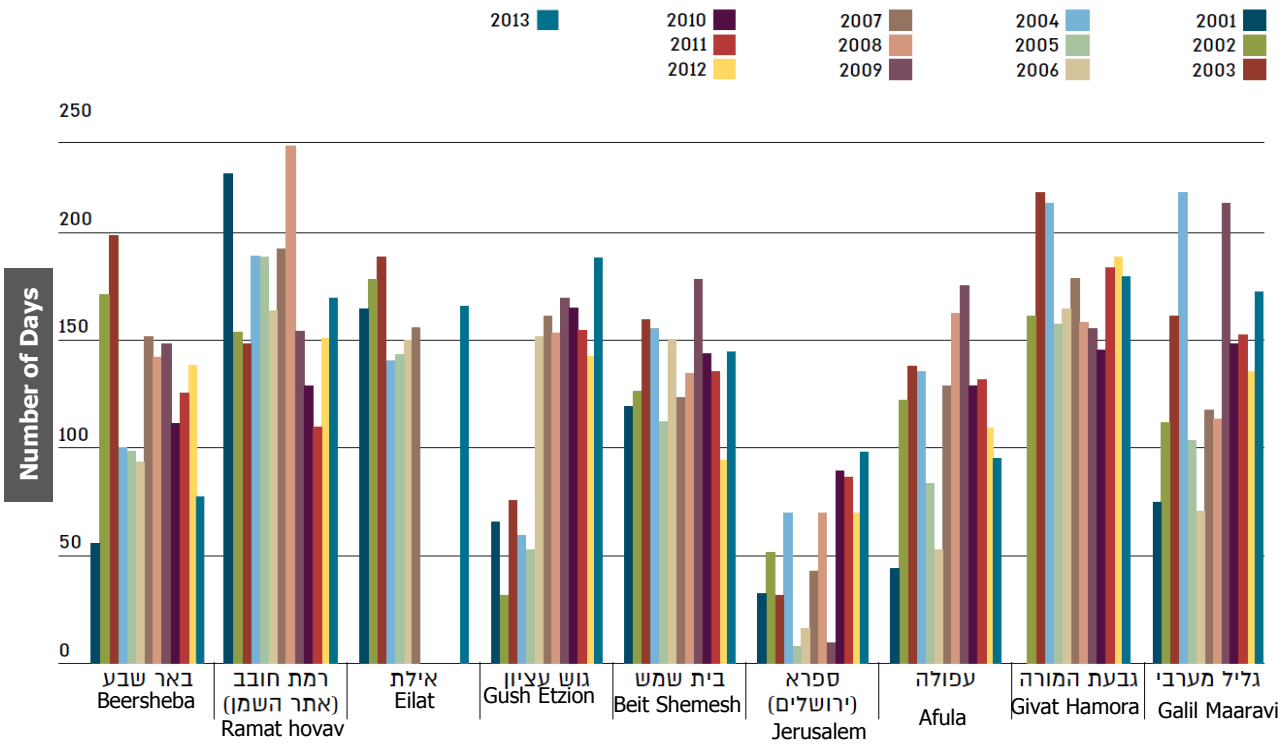
* It can be seen that, **in several cases, the concentration of particles in Israel is high and even exceeded the annual environmental standard**.

* One of the reasons for that, is the **high background concentrations originating from dust storms carried to Israel from the Arab deserts** and the surrounding area.



The Number of Days in a Year in which 8-hours-Air Concentrations Ozone Exceeded the Target Values (100 mg / m3), 2001-2013

- In 110-130 days of the year there are deviations from the eight-hour target (100 mg/m^3).
- Between 2002 and 2014 - a moderate increase in some of the monitoring stations in Israel. In others, there isn't a clear general trend.



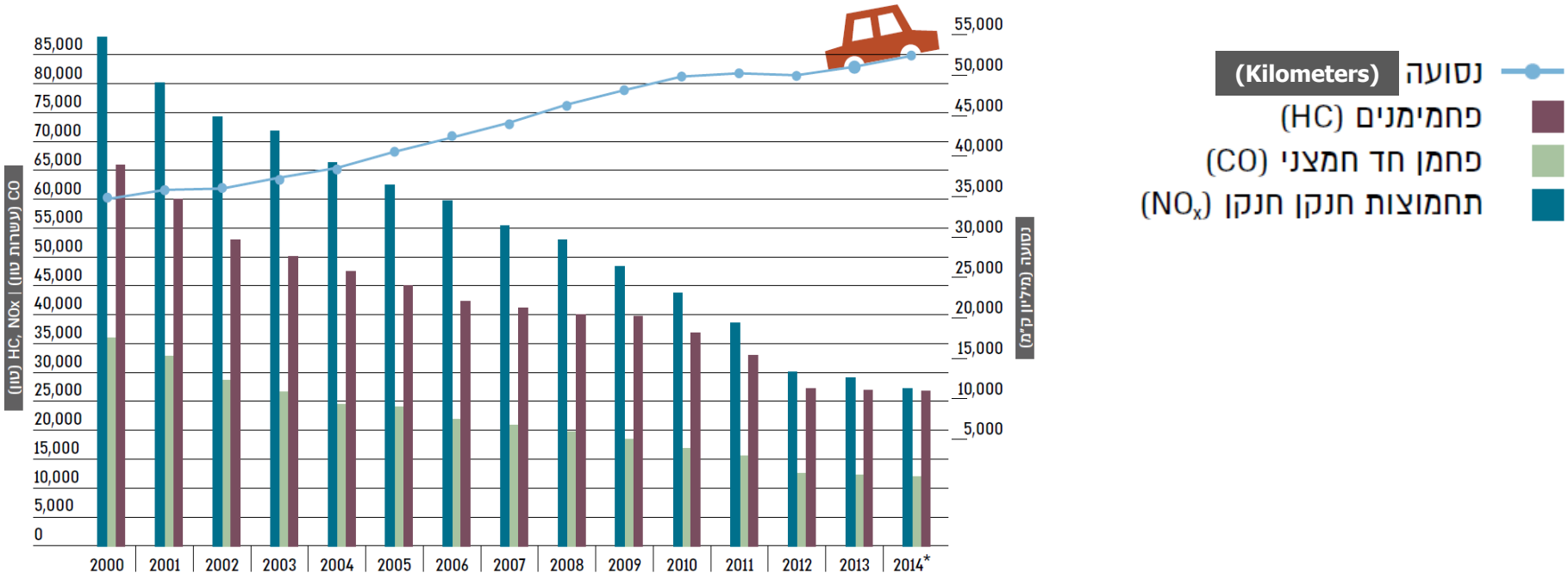
* **Most of the stations in the country received 110-130 days of deviations per year** (30-35% of the year).

Source of Data: Division of Air Quality and Climate Change, Ministry of Environmental Protection

The Transportation Pollution Race

Fuel Combustion of Nitrogen Oxides (NOx), Carbon Monoxide (CO) and Hydrocarbons (HC), From Vehicles vs. Kilometers 2000-2014

- From 2000 to 2014 - an increase of approx. 44% in kilometers traveled.
- Despite this increase, pollutant emissions went down: Hydrocarbons (59%), Carbon monoxide (67%), Nitrogen oxides (69%) and Suspended Dust particles (72%).
- Since 1994 - a catalytic converter reduces pollutants

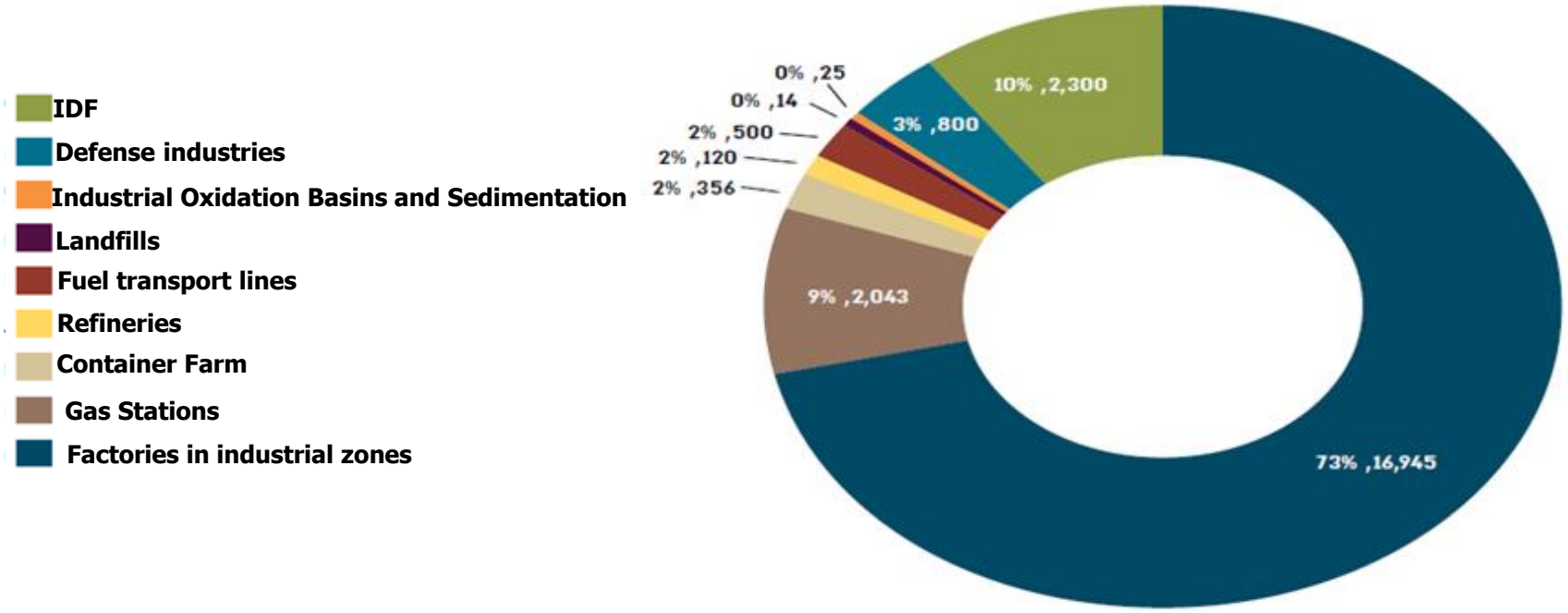


Source of Data: "Transport - Physical Data" and "Emissions from Fuel Combustion, by Consumer Fuel", 2000-2014, Central Bureau of Statistics

Contaminated Sites

Number of Suspected Contaminated Sites, By Sector, 2014

- In 2014, 23,100 suspected contaminated sites were mapped as a result of past and present activities.
- About 73% of the polluted sites are from **industrial plants** (the type of pollutions: oils, solvents, fuels, metals, pesticides, toxins, acids and bases). The next major sites are **army installations** and **gas stations**.

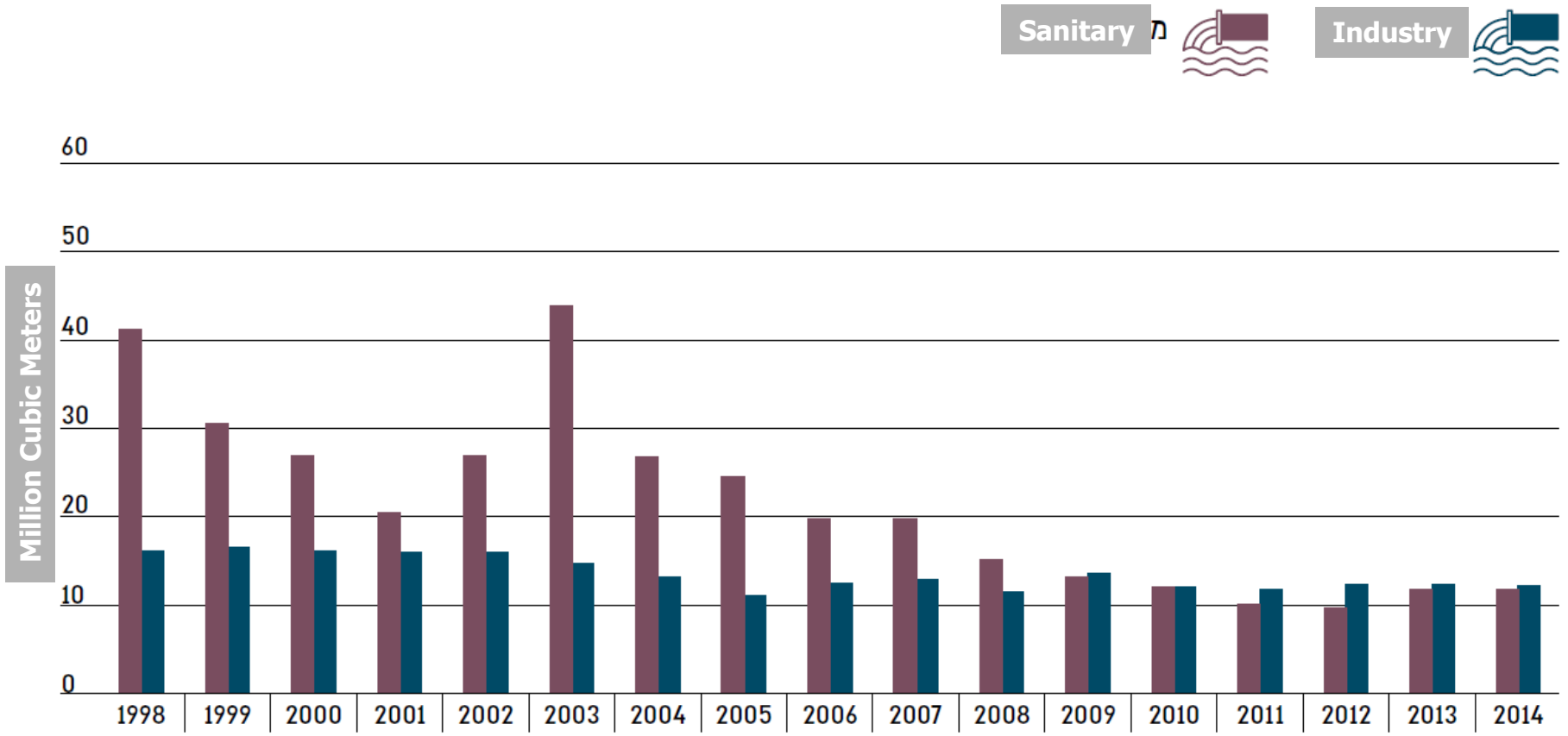


Data Source: National Cost Assessment Report of Land Survey and Treatment, 2014, by *LDD*, submitted to the Division of Polluted Land, Industrial Waste and Fuel, Ministry of the Environment

Wastewater & Sludge

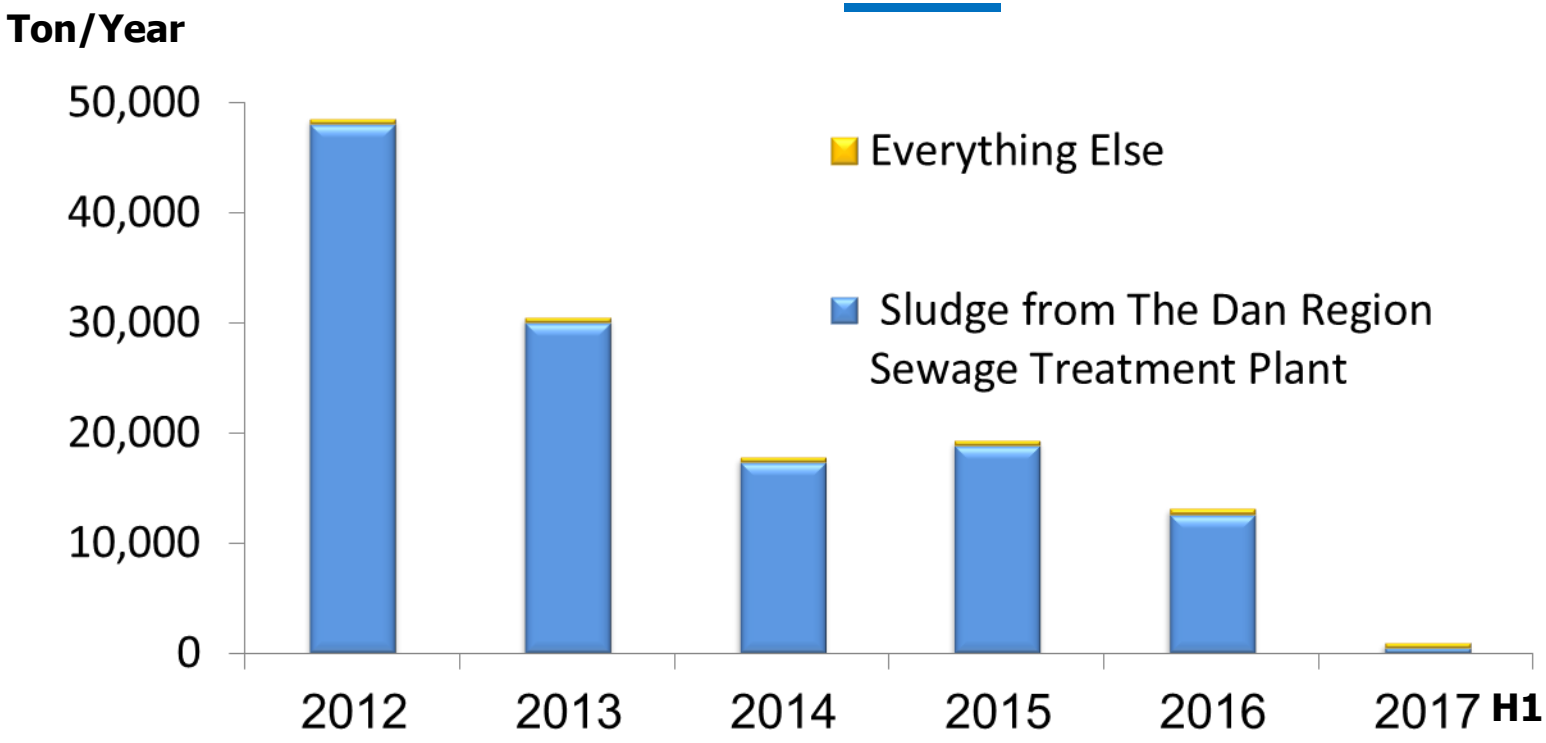
Wastewater discharge into the sea, 1998-2014

- The overall industrial discharge into the sea has been stable over the years with a moderate reduction trend.
- The capacity of the municipal wastewater treatment plants is gradually decreasing.



Source of Data: The National Marine Environmental Protection Unit, Ministry of Environmental Protection

Sludge emissions to the Mediterranean Sea



The main source of emissions to the Mediterranean Sea (the Dead Sea, the Haifa Bay and the Kishon River) of general organic carbon in 2016 is the discharge of the Dan Region Sewage
Treatment Plant sludge (over 95%).

his flow stopped at 6.2.17, with the sludge being transferred to the new anaerobic digestion facility and the An-Viro facility, for distribution as agricultural fertilizer.

Municipal Solid Waste

Municipal waste, 2009-2014

- In 2014 - 5.4 million tons of municipal waste or approx. 1.8 kg per capita