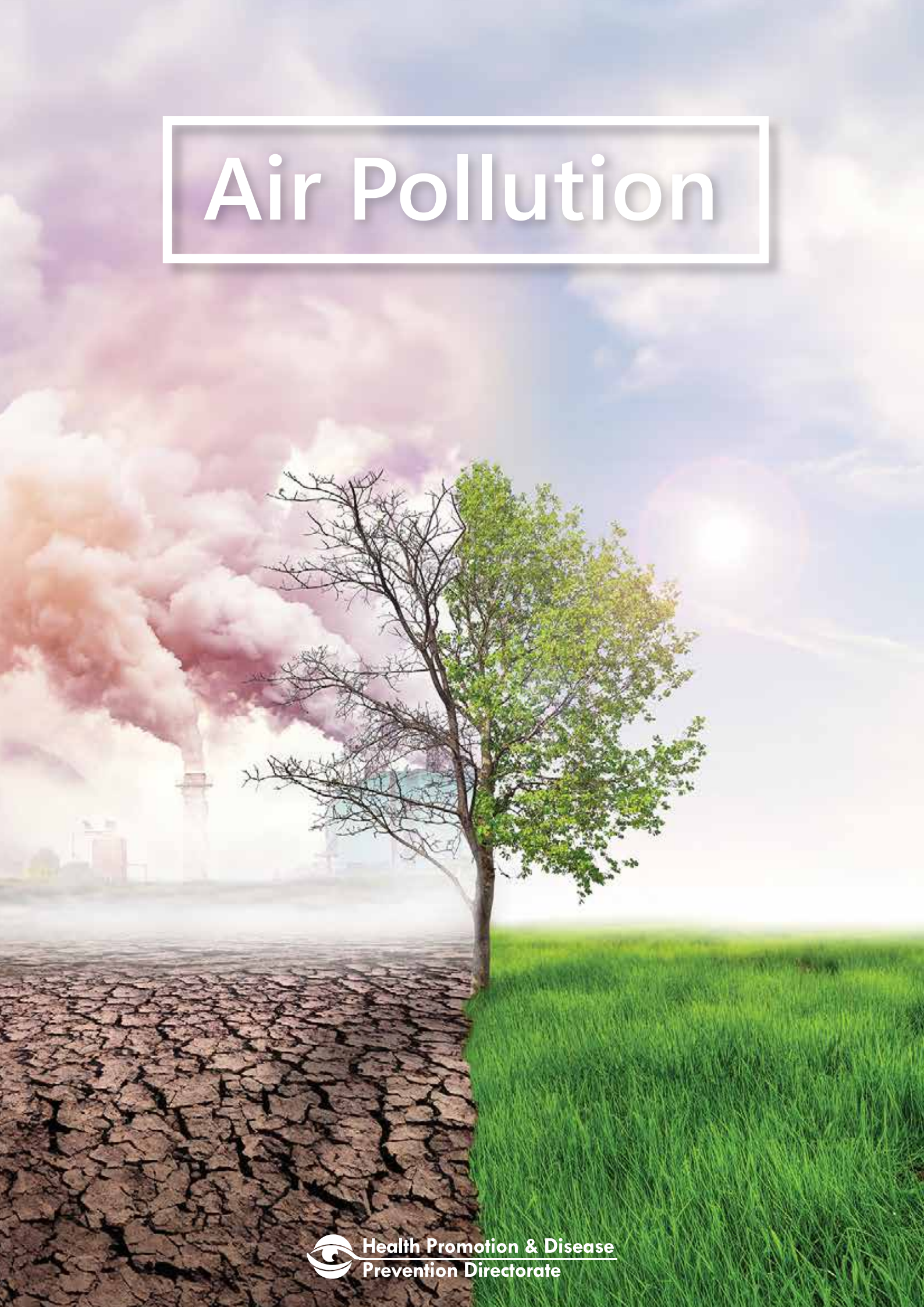
Air Pollution



Health Promotion & Disease Prevention Directorate

What is air pollution?

After tobacco, air pollution is the second highest risk factor for noncommunicable disease. It is defined as the contamination of outdoor and indoor pollution by any chemical, physical or biological agent that modifies the natural characteristics of the atmosphere.

The combined effects of ambient (outdoor) and household (indoor) air pollution are associated with 6.7 million premature deaths annually worldwide.

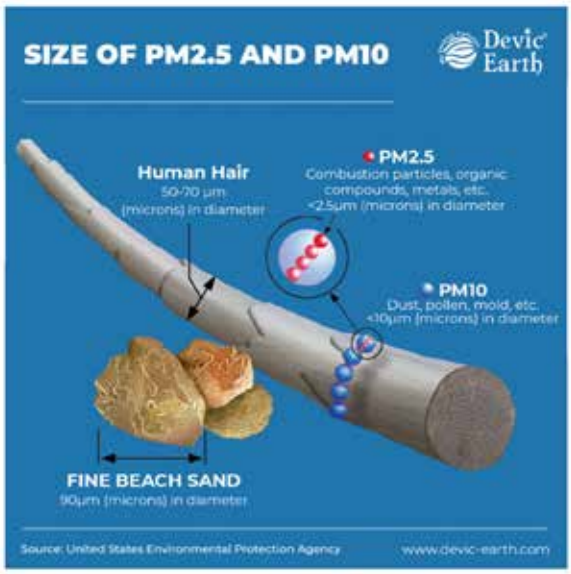
Air pollution is an invisible health threat.

What constitutes outdoor air pollution?

Pollutants in outdoor pollution include particulate matter, nitrogen dioxide, sulphur dioxide and other toxins. When mixed with water, oxygen and other chemicals, nitrogen dioxide and sulphur dioxide are responsible for the acid rain which causes harmful effects to the soil and trees.

Airborne particulate matter (PM) is a complex mixture of solids and aerosols composed of small droplets of liquid, dry solid fragments, and solid cores with liquid coatings. Particles are defined by their diameter for air quality regulatory purposes. Those with a diameter of 10 microns or less are known as (PM_{10}) and fine particulate matter is defined as particles that are 2.5 microns or less in diameter ($PM_{2.5}$).

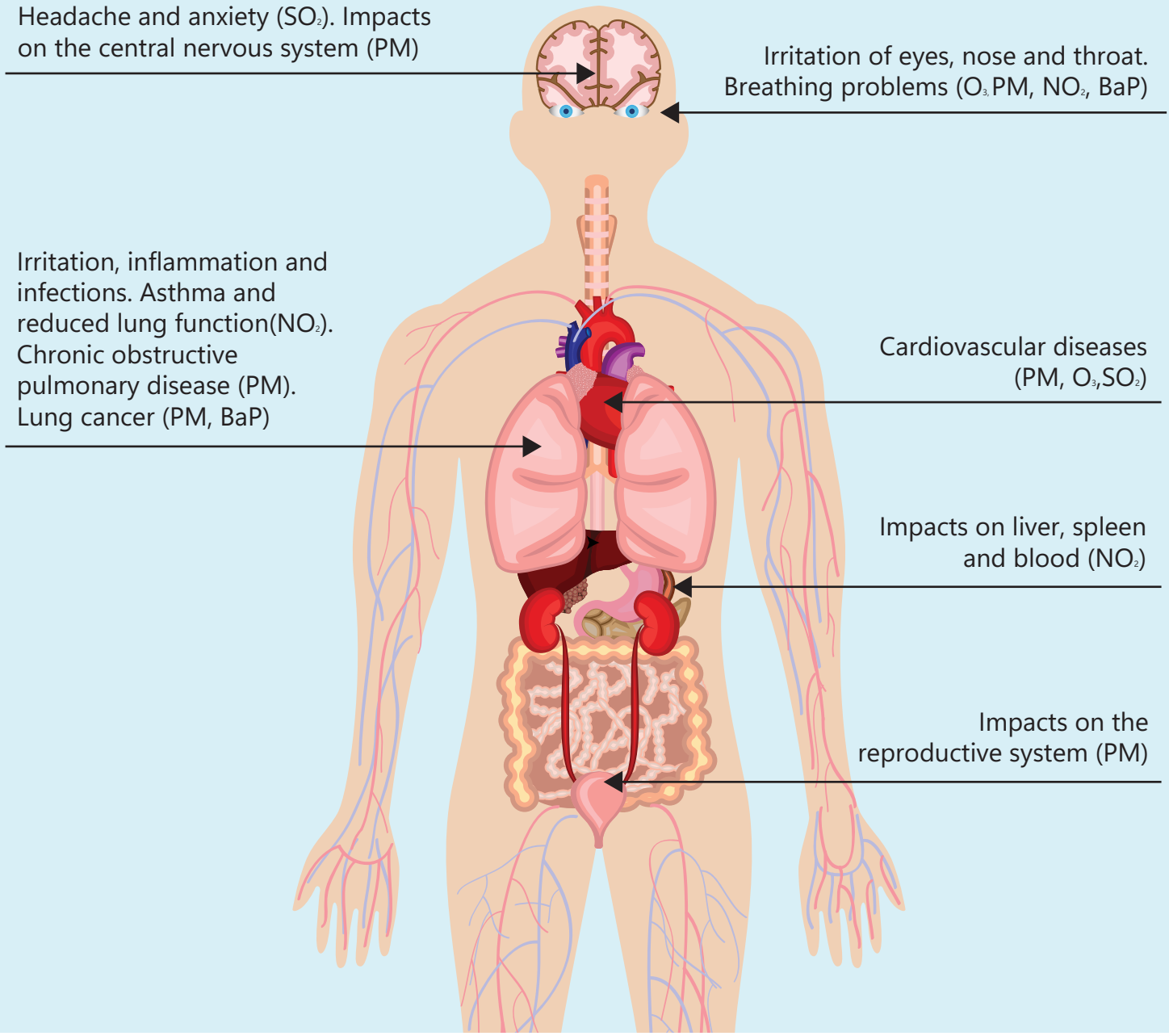
Emissions from combustion of gasoline, oil, diesel fuel or wood produce much of the $PM_{2.5}$ pollution found in outdoor air, as well as a significant proportion of PM_{10} also includes dust from construction sites, landfills and agriculture, wildfires and brush/waste burning, industrial sources, wind-blown dust from open lands, pollen and fragments of bacteria.



What are the main harmful effects of particulate matter on human health?

The International Agency for Research on Cancer (IARC) concluded that fine particulate matter is one of the main causes of lung cancer. Both $PM_{2.5}$ and PM_{10} are inhalable into the lungs but $PM_{2.5}$ can even enter the bloodstream, primarily resulting in cardiovascular and respiratory impacts, and also affecting other organs[1].

Short-term exposures to PM_{10} have been associated primarily with worsening of respiratory diseases, including asthma and chronic obstructive pulmonary disease (COPD). Long-term exposure to $PM_{2.5}$ has been linked to premature death, particularly in people who have chronic heart or lung diseases, and reduced lung function growth in children.



cc: EEA, "Healthy environment, healthy lives ," 2019 [2]

Note: Particulate matter with a diameter of 2.5 µm or less (PM2.5), particulate matter with a diameter of 10 µm or less (PM10), ozone (O_3), nitrogen dioxide (NO_2), benzo[a]pyrene (BaP) and sulphur dioxide (SO_2)

Air Quality Monitoring in Malta

The WHO Air quality guidelines are a set of evidence-based recommendations of limit values for specific air pollutants developed to help countries achieve air quality that protects public health. The WHO Air quality guidelines recommend levels and interim targets for common air pollutants: PM, O_3, NO_2, and SO_2.[3]

Malta has four automated near real-time monitoring stations. They are sited in fixed locations with varied territorial characteristics, demography and emission sources.

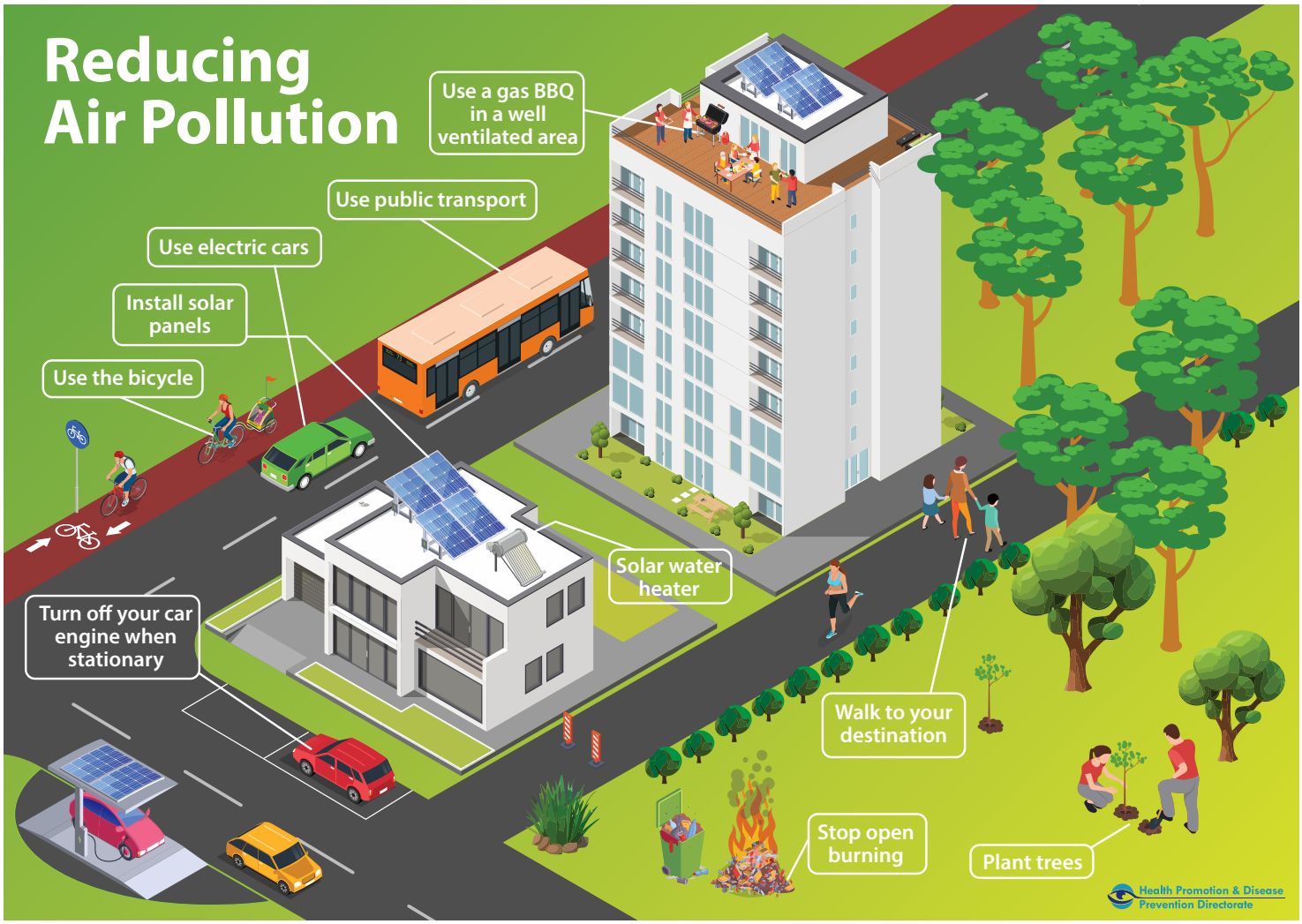
Health Impacts

Country	Avg. Population (x1000)	Population - weight annual mean ($PM_{2.5}$)	Attribute deaths ($PM_{2.5}$)	Population - weight annual mean (NO_2)	Attributable deaths (NO_2)	Population - weight SOMO35 (O_3)	Attributable deaths (O_3)
Malta	516	116	190	10.3	10	6.649	30
EU27	442.519	11.4	253.000	14.4	52.000	3.794	22.000
Total*	**558.768**	**11.6**	**293.000**	**16.1**	**69.000**	**4.020**	**27.000**

Retrieved from the European Environment Agency: https://www.eea.europa.eu/themes/air/country-fact-sheets/2023-country-fact-sheets/malta-air-pollution-country

***Refers to all EEA countries**

How can we reduce outdoor air polution?



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2. https://www.eea.europa.eu/en/topics/in-depth/air-pollution/eow-it-affects-our-health
3. https://iris.who.int/bitstream/handle/10665/345329/9789240034228-eng.pdf

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