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I.E.S. PUNTA DEL VERDE

W.E.E. and Air Quality

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Residuos Eléctricos y Electrónicos y Calidad del Aire

Air quality
Informative session

Authors:
The American College of Sofía, Bulgaria.
Second Vocational High School of Chania. Grecia,
I.E.S Punta del Verde de Sevilla. España

We breathe

Human beings breathe 1 time every 5 seconds, and we inhale about 6 liters of air per minute.

Every day we inhale 8640 liters of air.

Main air pollutants

NO_2

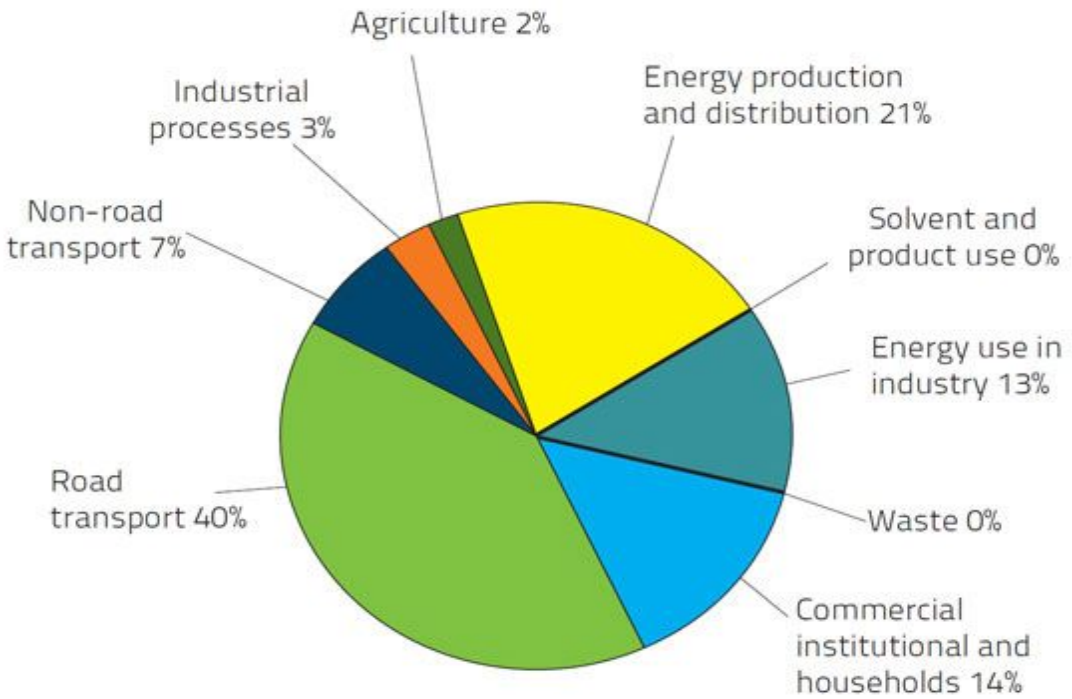
O_3

PM_{10} y $PM_{2,5}$

Others (CO, CO_2, CH_4, SO_2)

Nitrogen Dioxide (NO_2)

Occurrence



http://www.icopal-noxite.co.uk/~/media/NoxiteUK/charts/Chart-share-of-emissions-by-sector-group-2011.jpg

- 40% from road transportation
- Results from burning fossil fuels both for energy and in engines

Nitrogen Dioxide (NO_2)

Affecting Health

- Increased likelihood of respiratory problems
- Reduced immunity to lung infections
- Wheezing, coughing, colds, flu and bronchitis
- People with asthma and older people with heart disease are most at risk
- Can result in more frequent and more intense asthma attacks

Nitrogen Dioxide (NO_2)

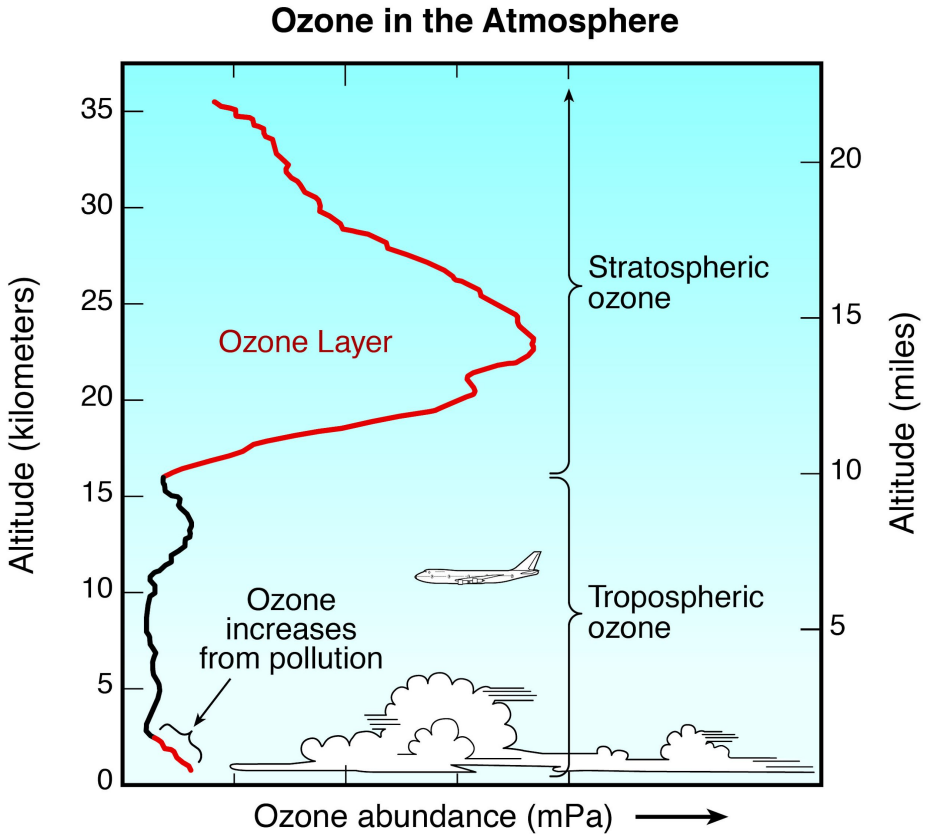
Ways to reduce the amount of Nitrogen Dioxide

- Fuel switching: switch to a fuel with reduced nitrogen content like natural gas
- Use your car less: try to use bicycle instead, since most of the nitrogen dioxide in cities comes from motor vehicle exhaust

Ozone (O_3)

Ozone in the atmosphere

- Upper layer
  - 6 to 30 miles above Earth's surface
  - Occurs naturally
  - Protective layer - absorb ultraviolet rays
  - Man-made chemicals destroy it
- Ground level
  - Formed by pollutants
  - Harmful



https://atmosphere.copernicus.eu/sites/default/files/inline-images/ozone.jpg

Ozone (O_3)

People at Risk

- People with asthma
- Children
- Older adults
- People who are active outdoors, especially outdoor workers

Health Risks

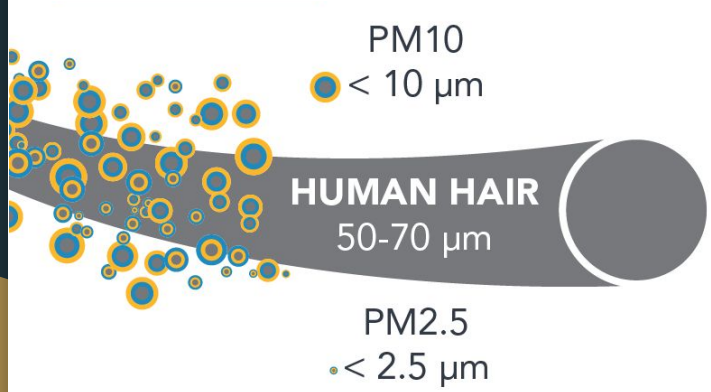
- More difficult to breathe deeply and vigorously
- Cause shortness of breath and pain when taking a deep breath
- Cause coughing and sore or scratchy throat
- Inflame and damage the airways
- Asthma, emphysema, and chronic bronchitis
- Increase the frequency of asthma attacks
- Lungs are more susceptible to infection
- Continue to damage the lungs even when the symptoms have disappeared
- Cause chronic obstructive pulmonary disease

Ozone (O_3)

How to reduce your health risk

- Be aware of ozone air quality levels, especially in the summer or when outdoor temperatures are high
- Avoid exercising or working outdoors when ozone levels are high
- If you are elderly, or have asthma or any other respiratory diseases, avoid being outdoors when ozone levels are high
- Use websites as World Air Quality that provide daily reports on air pollution

Particles PM2.5 and PM10



Main Characteristics

- Particulate matter is a mixture of aerosol particles (solid and liquid) covering a wide range of sizes and chemical compositions
- PM2.5 is particulate matter 2.5 micrometers or less in diameter, while PM10 is 10 micrometers

Particles PM2.5 and PM10

Occurrence

- Directly emitted as primary particles or form in the atmosphere from emissions of certain precursor pollutants such as SO_2, NO_2, NH_3, and NMVOCs.
- Emitted from anthropogenic sources: burning of fossil fuels in electricity generation, transport, industry and households
- Emitted also during industrial processes and solvent use (in the chemical and mining industries) and as a product of agriculture and waste treatment

Particles PM2.5 and PM10

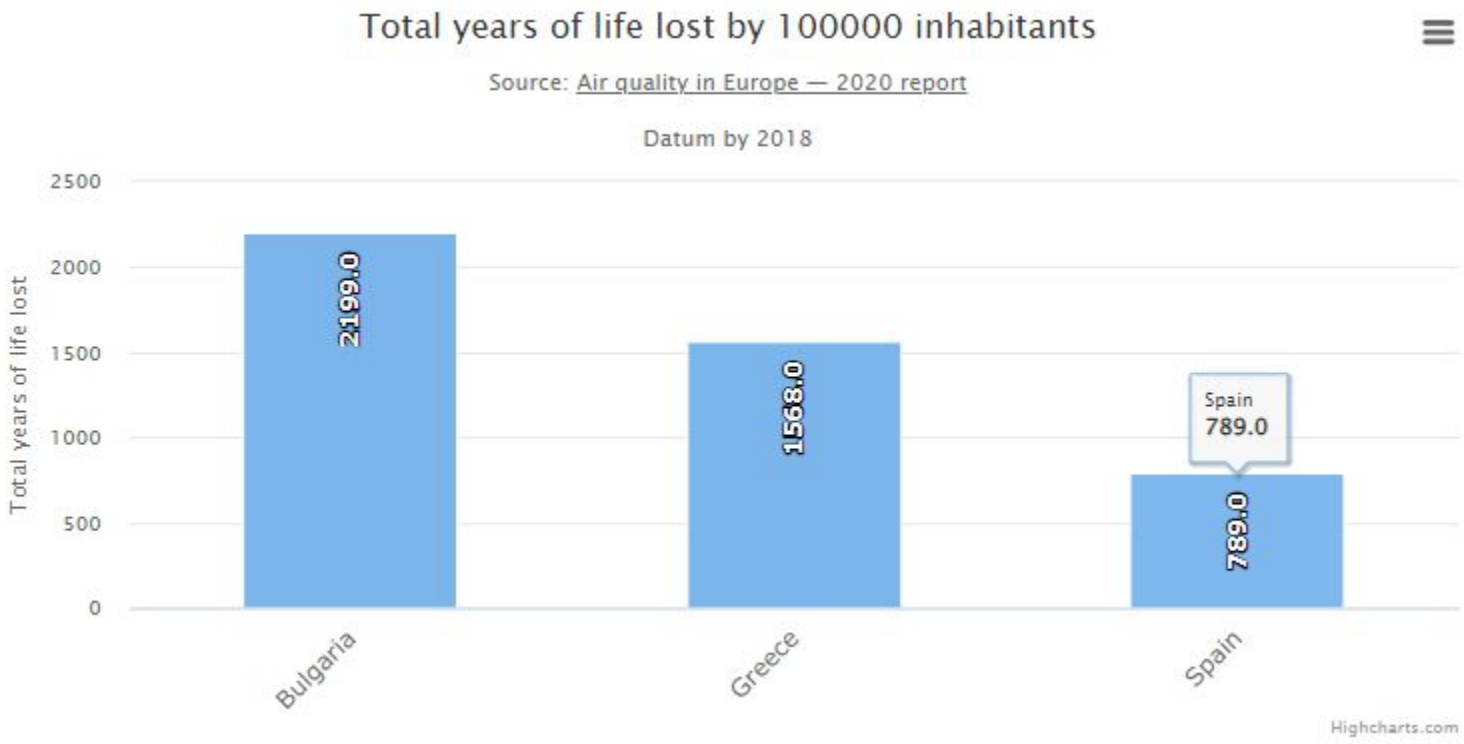
Affecting Health

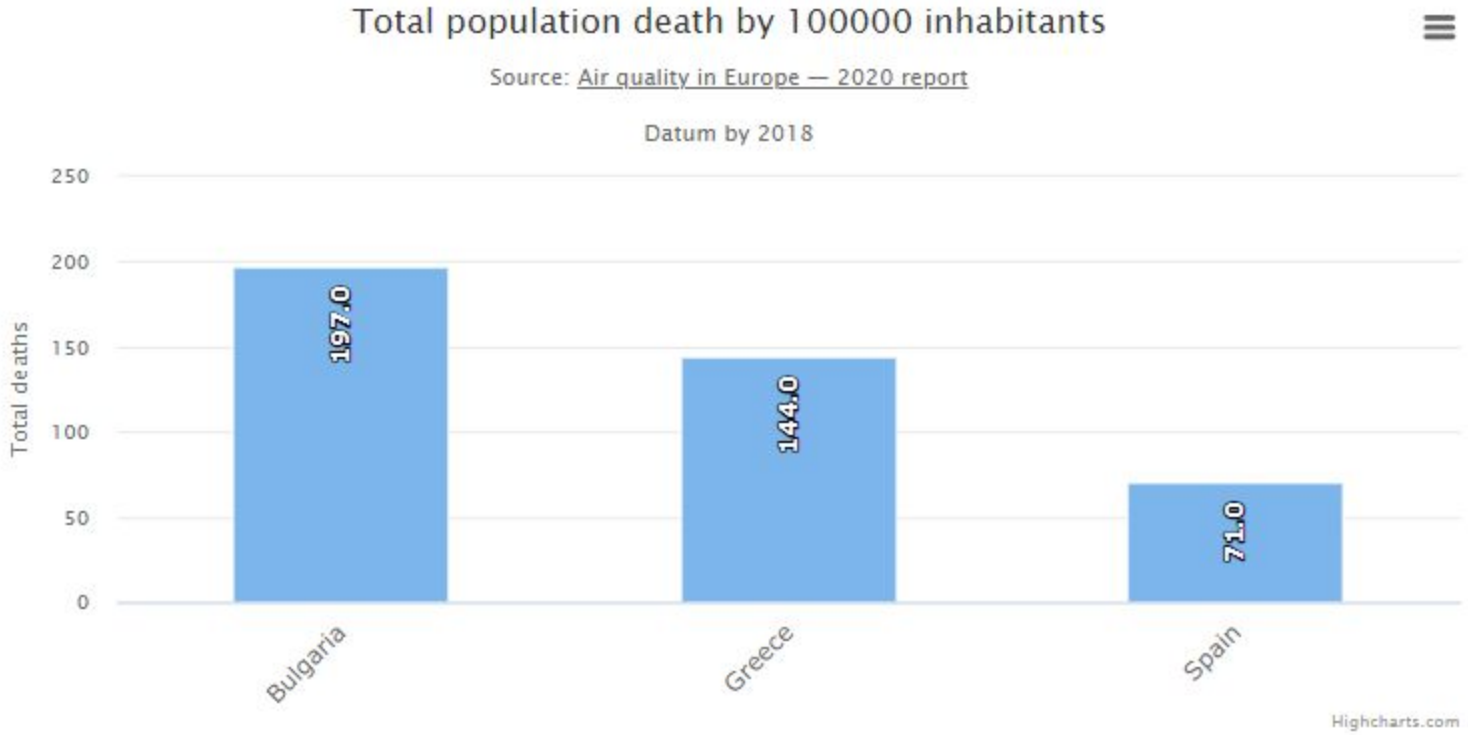
- Causes or aggravates cardiovascular and lung diseases, heart attacks and arrhythmias.
- Affects the central nervous system and the reproductive system, can cause cancer.
- One outcome of exposure to PM can be premature death

Particles PM2.5 and PM10
How to reduce pollution?

- The government should encourage the use of public transport through initiatives like the green tickets.
- Social support should be given to people to go back to central heating and gasification.
- Changes in the legislation are necessary in order to force citizens to use newer cars

APPLICATION




Total population death by 100000 inhabitants
Source: Air quality in Europe — 2020 report
Datum by 2018
Total deaths
250
200
150
100
50
0
197.0
144.0
71.0
Bulgaria
Greece
Spain
Highcharts.com

Personal actions to improve air quality

- Get around on foot, by bicycle or by public transport.
- Eat Seasonal and local Foods.
- Avoid food waste.
- Use “ecosia” as a search engine on the web.
- Infórmate del estado de la calidad del aire en tu entorno.
    - Plugin. App.
    - Web1. Web2. Web3.
- Design a device to measure air quality.
- Air Pollution. National Geographic

Bibliography:

Air Particles and Pollution in Sofia

What to eat in order to harm the environment less?

Why Should We Eat Seasonal Foods?

¿Cómo el desperdicio de alimentos impacta el medio ambiente en Bulgaria y en particular la calidad del aire?.

El desperdicio de alimentos. Opiniones personales.

European emission standards - EURO

Plugin air quality

App Air quality

Historical air quality data

Air quality in Europe — 2020 report

Air quality, deaths and life expectancy. Graphic and statistical analysis.

Design a device to measure air quality.

Air Pollution. National Geographic

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