





Air Inequity Dashboard:

Insights on Pollution & Socioeconomic Disparities

Statistics Netherlands

Athithya, Chris, Shaya

11-03-2025

Take a deep breath



Air pollution

- Air pollution is an invisible threat



2022

| Pollutant | Premature deaths |
|-----------|------------------|
| PM2.5 | 239,000 |
| O3 | 70,000 |
| NO2 | 48,000 |



Inequality across Europe

- Air quality is not shared equally
- Low-income and marginalized groups often live near:
 - Industrial sites
 - Busy roads
 - Areas with poor air quality
- Higher pollution exposure and worsening health inequalities



**Air pollution isn't just an environmental
issue—it's a social one**



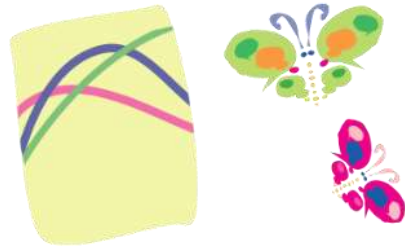
EU Policies for Cleaner Air and Equity

EU policies aim to reduce air pollution and its unequal impacts:

- **Ambient Air Quality Directive**
- **Zero Pollution Action Plan 2030**
- target a **55% reduction in pollution-related premature deaths** by 2030.
- **Other relevant policies:** European Green Deal, Just Transition Mechanism



How can policymakers ensure cleaner air reaches those who need it most?

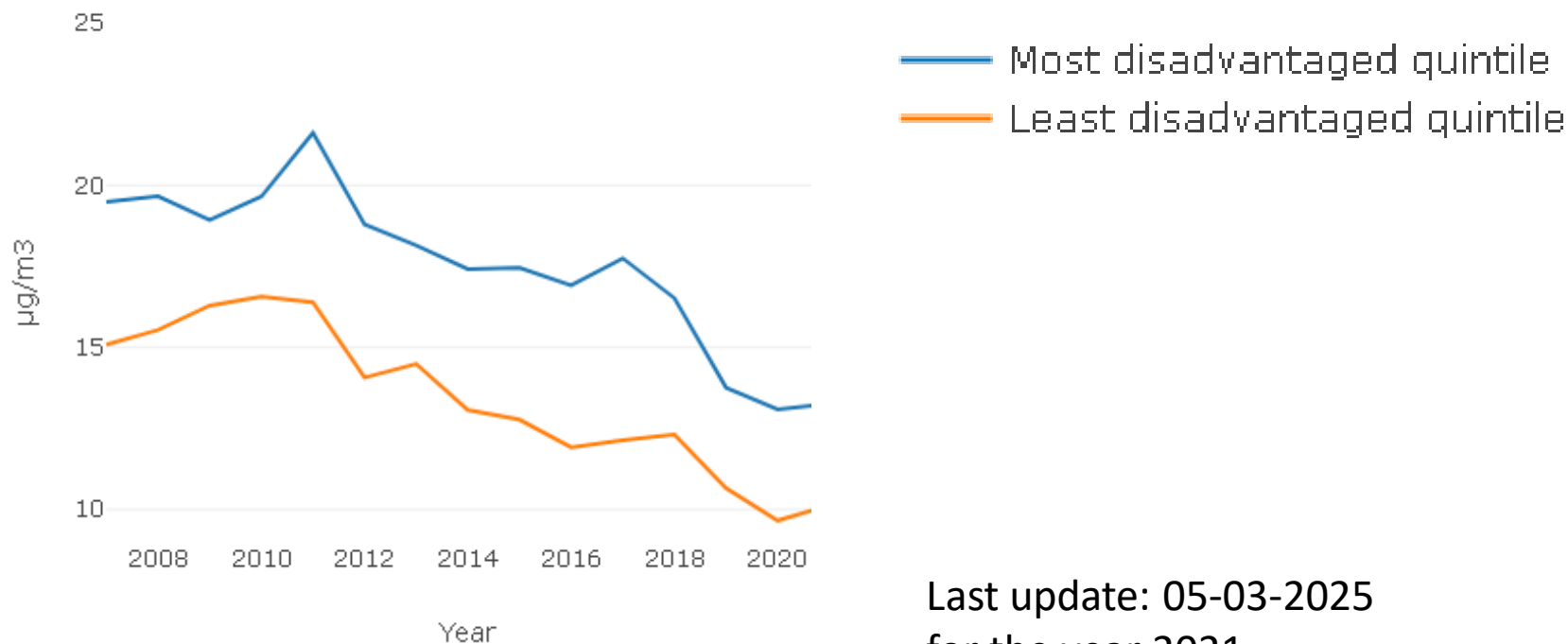


Policymaker
of the Future

Air Inequity Dashboard



Inequity in exposure to air pollution (EEA)



Last update: 05-03-2025
for the year 2021



Improvement

EEA approach

Yearly updates

PM2.5 only

Limited spatially

Static reports

CBS approach

Potential daily updates

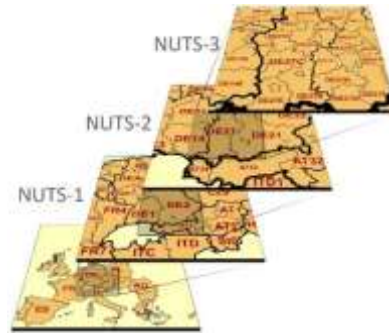
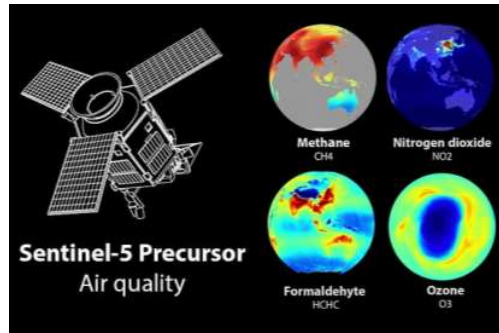
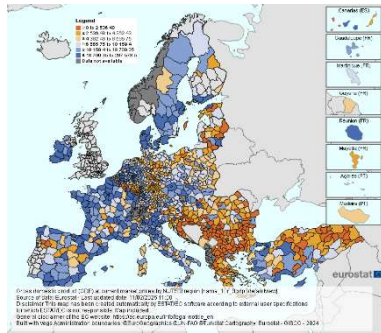
Multiple pollutants

Full NUTS3 coverage

Interactive and on-demand



Datasets



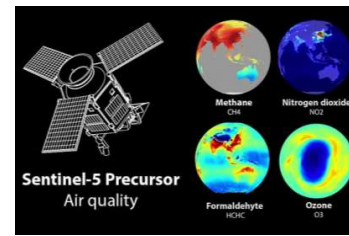
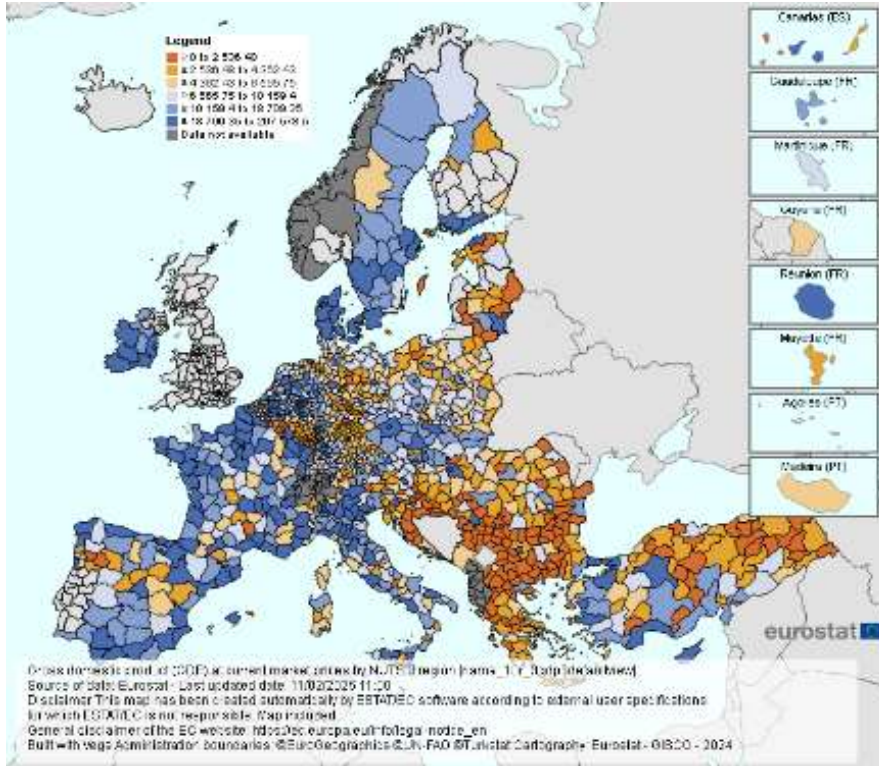
| POLLUTANT | INDEX LEVEL <i>(based on pollutant concentrations in µg/m3)</i> | | | | | |
|--|--|-----------|-------------|-----------|----------------|---------------------|
| | 1 Very good | 2 Good | 3 Medium | 4 Poor | 5 Very Poor | 6 Extremely Poor |
| Ozone (O ₃) | 0-50 | 50-100 | 100-130 | 130-240 | 240-380 | 380-800 |
| Nitrogen dioxide (NO ₂) | 0-40 | 40-90 | 90-120 | 120-230 | 230-340 | 340-1000 |
| Sulphur dioxide (SO ₂) | 0-100 | 100-200 | 200-350 | 350-500 | 500-750 | 750-1250 |
| Particules less than 10 µm (PM ₁₀) | 0-20 | 20-40 | 40-50 | 50-100 | 100-150 | 150-1200 |
| Particules less than 2.5 µm (PM _{2.5}) | 0-10 | 10-20 | 20-25 | 25-50 | 50-75 | 75-800 |

Note: PM10 and PM2.5 values are based on 24-hour running means

| Pollutant | Winter (Dec-Feb) | Spring (Mar-May) | Summer (Jun-Aug) | Autumn (Sep-Nov) |
|-----------------|------------------|------------------|------------------|------------------|
| PM2.5 | 0.40 | 0.36 | 0.25 | 0.35 |
| NO ₂ | 0.25 | 0.22 | 0.15 | 0.23 |
| O ₃ | 0.10 | 0.15 | 0.30 | 0.15 |
| SO ₂ | 0.12 | 0.12 | 0.05 | 0.12 |
| CO | 0.06 | 0.07 | 0.10 | 0.07 |
| HCHO | 0.07 | 0.08 | 0.15 | 0.08 |



Datasets



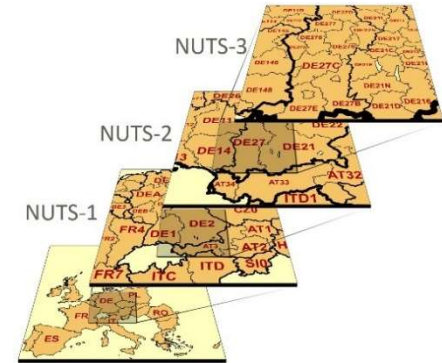
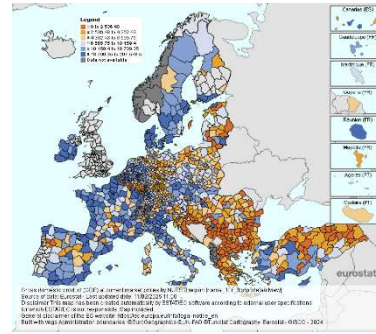
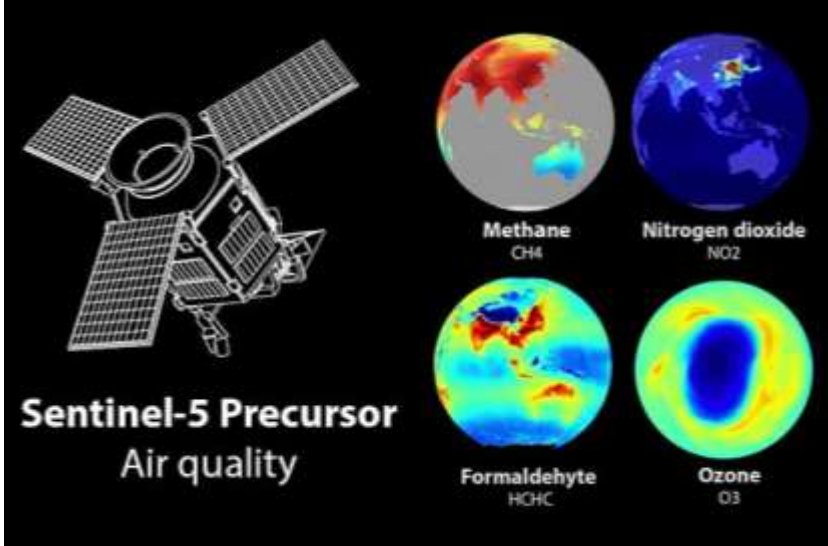
| POLLUTANT | INDEX LEVEL (based on pollutant concentrations in µg/m ³) | | | | | |
|--|--|-----------|-------------|-----------|----------------|---------------------|
| | 1 Very good | 2 Good | 3 Medium | 4 Poor | 5 Very Poor | 6 Extremely Poor |
| Ozone (O ₃) | 0-50 | 50-100 | 100-130 | 130-240 | 240-380 | >380 |
| Nitrogen dioxide (NO ₂) | 0-40 | 40-90 | 90-120 | 120-230 | 230-340 | >340 |
| Sulphur dioxide (SO ₂) | 0-100 | 100-200 | 200-350 | 350-500 | 500-750 | >750 |
| Particulates less than 10 µm (PM ₁₀) | 0-20 | 20-40 | 40-50 | 50-100 | 100-150 | 150-180 |
| Particulates less than 2.5 µm (PM _{2.5}) | 0-10 | 10-20 | 20-25 | 25-50 | 50-75 | 75-80 |

Note: PM₁₀ and PM_{2.5} values are based on 24-hour running means

| Pollut ant | Winter (Dec- Feb) | Spring (Mar- May) | Summer (Jun-Aug) | Autumn (Sep- Nov) |
|-------------------|-------------------|-------------------|------------------|-------------------|
| PM _{2.5} | 0.40 | 0.36 | 0.25 | 0.35 |
| NO ₂ | 0.25 | 0.22 | 0.15 | 0.23 |
| O ₃ | 0.10 | 0.15 | 0.30 | 0.15 |
| SO ₂ | 0.12 | 0.12 | 0.05 | 0.12 |
| CO | 0.06 | 0.07 | 0.10 | 0.07 |
| HCHO | 0.07 | 0.08 | 0.15 | 0.08 |



Datasets



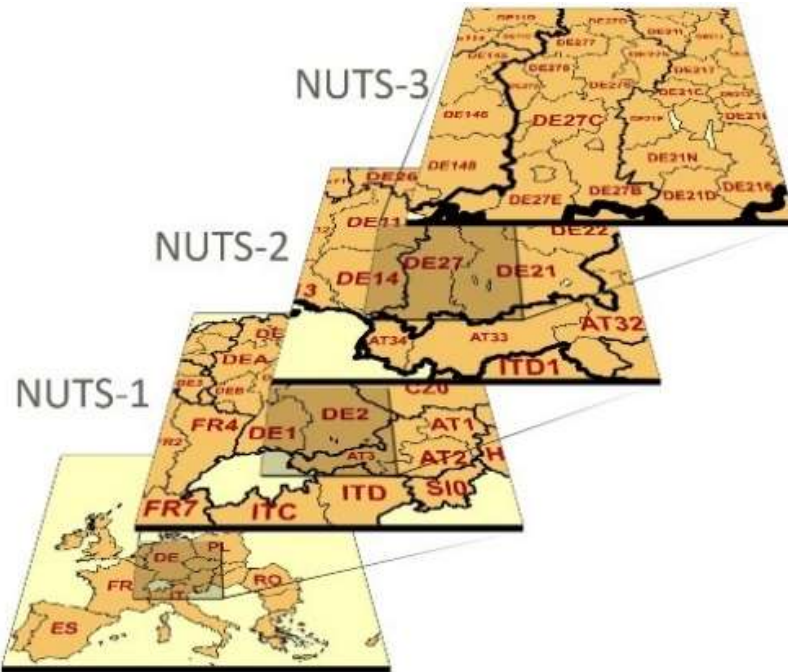
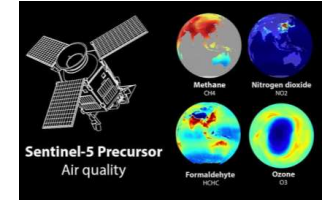
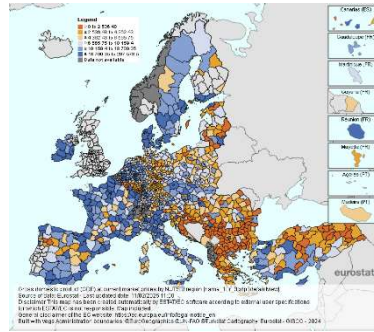
| POLLUTANT | INDEX LEVEL (based on pollutant concentrations in µg/m ³) | | | | | |
|--|--|-----------|-------------|-----------|----------------|---------------------|
| | 1 Very good | 2 Good | 3 Medium | 4 Poor | 5 Very Poor | 6 Extremely Poor |
| Ozone (O ₃) | ≤ 50 | 50-100 | 100-150 | 150-240 | 240-300 | > 300 |
| Nitrogen dioxide (NO ₂) | ≤ 40 | 40-90 | 90-120 | 120-230 | 230-340 | > 340 |
| Sulphur dioxide (SO ₂) | ≤ 100 | 100-200 | 200-300 | 300-500 | 500-700 | > 700 |
| Particulates less than 10 µm (PM ₁₀) | ≤ 20 | 20-40 | 40-50 | 50-100 | 100-150 | > 150 |
| Particulates less than 2.5 µm (PM _{2.5}) | ≤ 10 | 10-20 | 20-25 | 25-50 | 50-75 | > 75 |

Note: PM₁₀ and PM_{2.5} values are based on 24-hour running means.

| Pollutant | Winter (Dec-Feb) | Spring (Mar-May) | Summer (Jun-Aug) | Autumn (Sep-Nov) |
|-------------------|------------------|------------------|------------------|------------------|
| PM _{2.5} | 0.40 | 0.36 | 0.25 | 0.35 |
| NO ₂ | 0.25 | 0.22 | 0.15 | 0.23 |
| O ₃ | 0.10 | 0.15 | 0.30 | 0.15 |
| SO ₂ | 0.12 | 0.12 | 0.05 | 0.12 |
| CO | 0.06 | 0.07 | 0.10 | 0.07 |
| HCHO | 0.07 | 0.08 | 0.15 | 0.08 |



Datasets



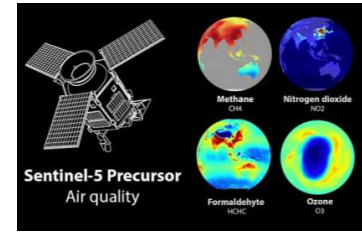
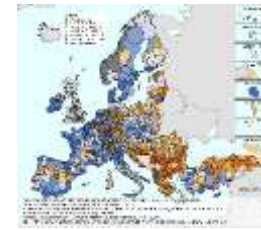
| POLLUTANT | RQCL LEVEL (based on pollutant concentrations in µg/m³) | | | | | |
|--|---|---------|---------|---------|-----------|----------------|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| | Very good | Good | Medium | Poor | Very Poor | Extremely Poor |
| Ozone (O ₃) | 50-60 | 50-150 | 150-120 | 120-240 | 240-360 | 360-600 |
| Nitrogen dioxide (NO ₂) | 5-10 | 40-90 | 90-120 | 120-230 | 230-340 | 340-450 |
| Sulphur dioxide (SO ₂) | 5-100 | 100-150 | 200-100 | 350-500 | 500-750 | 750-1000 |
| Particulates less than 10 µm (PM ₁₀) | 5-10 | 20-40 | 40-50 | 50-100 | 100-150 | 150-200 |
| Particulates less than 2.5 µm (PM _{2.5}) | 5-10 | 10-20 | 20-25 | 25-50 | 50-75 | 75-100 |

Note: Hour and PM_{2.5} values are based on 24-hour running means.

| Pollutant | Winter (Dec-Feb) | Spring (Mar-May) | Summer (Jun-Aug) | Autumn (Sep-Nov) |
|-------------------|------------------|------------------|------------------|------------------|
| PM _{2.5} | 0.40 | 0.36 | 0.25 | 0.35 |
| NO ₂ | 0.25 | 0.22 | 0.15 | 0.23 |
| O ₃ | 0.10 | 0.15 | 0.30 | 0.15 |
| SO ₂ | 0.12 | 0.12 | 0.05 | 0.12 |
| CO | 0.06 | 0.07 | 0.10 | 0.07 |
| HCHO | 0.07 | 0.08 | 0.15 | 0.08 |



Datasets



| POLLUTANT | INDEX LEVEL <i>(based on pollutant concentrations in $\mu\text{g}/\text{m}^3$)</i> | | | | | |
|--|--|-----------|-------------|-----------|----------------|---------------------|
| | 1 Very good | 2 Good | 3 Medium | 4 Poor | 5 Very Poor | 6 Extremely Poor |
| Ozone (O_3) | 0-50 | 50-100 | 100-130 | 130-240 | 240-380 | 380-800 |
| Nitrogen dioxide (NO_2) | 0-40 | 40-90 | 90-120 | 120-230 | 230-340 | 340-1000 |
| Sulphur dioxide (SO_2) | 0-100 | 100-200 | 200-350 | 350-500 | 500-750 | 750-1250 |
| Particules less than $10 \mu\text{m}$ (PM_{10}) | 0-20 | 20-40 | 40-50 | 50-100 | 100-150 | 150-1200 |
| Particules less than $2.5 \mu\text{m}$ ($\text{PM}_{2.5}$) | 0-10 | 10-20 | 20-25 | 25-50 | 50-75 | 75-800 |

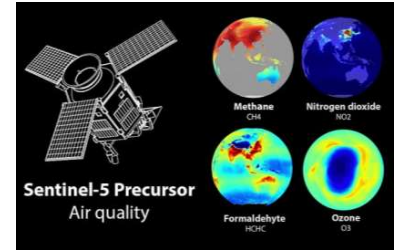
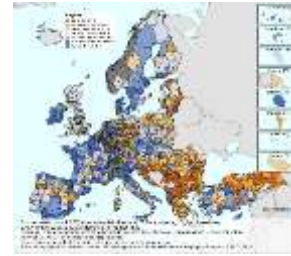
Note: PM_{10} and $\text{PM}_{2.5}$ values are based on 24-hour running means



| Pollutant | Winter (Dec-Feb) | Spring (Mar-May) | Summer (Jun-Aug) | Autumn (Sep-Nov) |
|-------------------|------------------|------------------|------------------|------------------|
| $\text{PM}_{2.5}$ | 0.40 | 0.36 | 0.25 | 0.35 |
| NO_2 | 0.25 | 0.22 | 0.15 | 0.23 |
| O_3 | 0.10 | 0.15 | 0.30 | 0.15 |
| SO_2 | 0.12 | 0.12 | 0.05 | 0.12 |
| CO | 0.06 | 0.07 | 0.10 | 0.07 |
| HCHO | 0.07 | 0.08 | 0.15 | 0.08 |



Datasets



| Pollutant | Winter (Dec-Feb) | Spring (Mar-May) | Summer (Jun-Aug) | Autumn (Sep-Nov) |
|-----------------|------------------|------------------|------------------|------------------|
| PM2.5 | 0.40 | 0.36 | 0.25 | 0.35 |
| NO ₂ | 0.25 | 0.22 | 0.15 | 0.23 |
| O ₃ | 0.10 | 0.15 | 0.30 | 0.15 |
| SO ₂ | 0.12 | 0.12 | 0.05 | 0.12 |
| CO | 0.06 | 0.07 | 0.10 | 0.07 |
| HCHO | 0.07 | 0.08 | 0.15 | 0.08 |



| POLLUTANT | INDEX LEVEL <i>(based on pollutant concentrations in µg/m³)</i> | | | | | |
|--|---|---------|---------|---------|-----------|----------------|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| | Very good | Good | Medium | Poor | Very Poor | Extremely Poor |
| Ozone (O ₃) | 0-50 | 50-100 | 100-130 | 130-240 | 240-380 | 380-800 |
| Nitrogen dioxide (NO ₂) | 0-40 | 40-90 | 90-120 | 120-230 | 230-340 | 340-1000 |
| Sulphur dioxide (SO ₂) | 0-100 | 100-200 | 200-350 | 350-500 | 500-750 | 750-1500 |
| Particules less than 10 µm (PM ₁₀) | 0-20 | 20-40 | 40-50 | 50-100 | 100-150 | 150-1000 |
| Particules less than 2.5 µm (PM _{2.5}) | 0-10 | 10-20 | 20-25 | 25-50 | 50-75 | 75-800 |

Note: PM10 and PM2.5 values are based on 24-hour running means.



Methodology

$$API_{NUTS3} = \sum_{Pollutant} (APSPollutant \times Weight_{season})$$

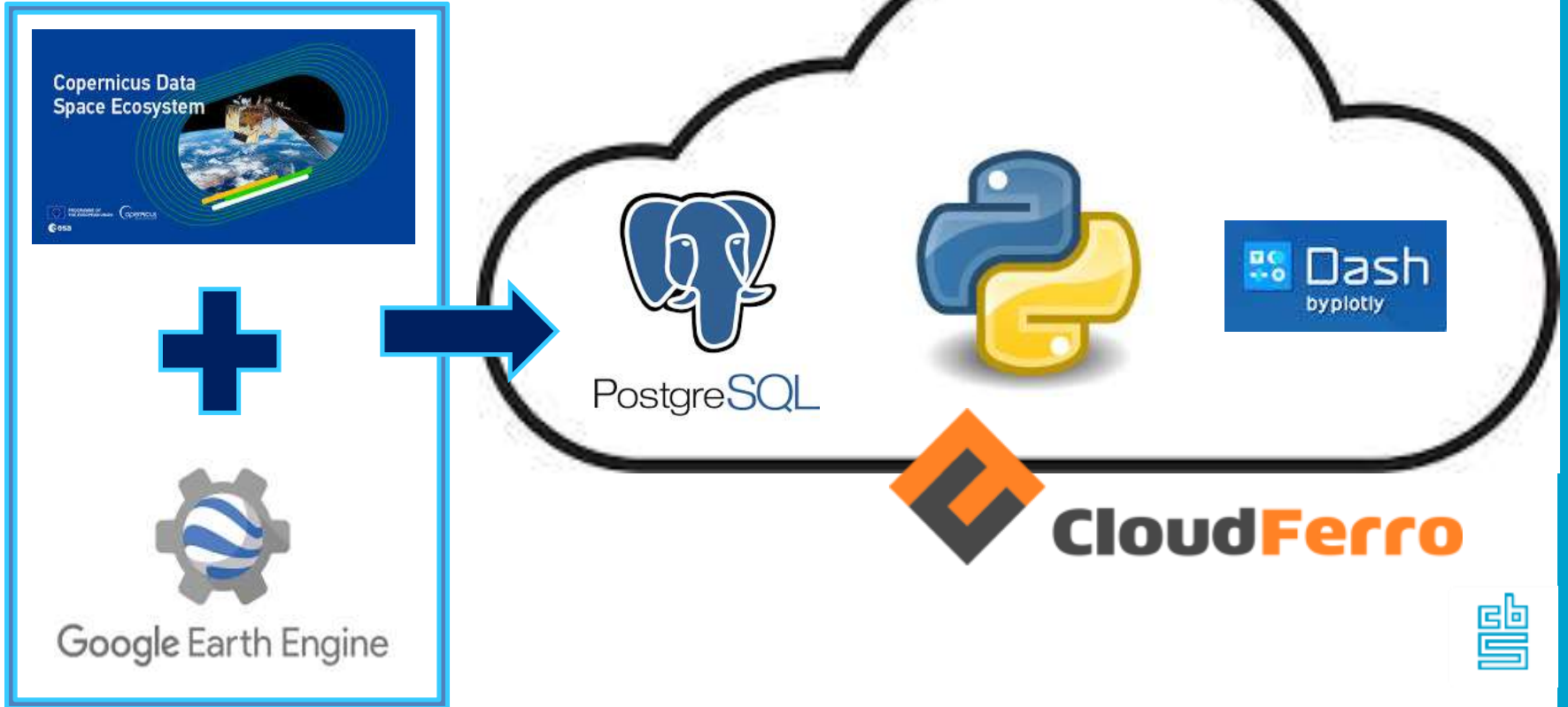
$$GDP'_{NUTS3} = 1 - \frac{GDP_{NUTS3} - GDP_{Min}}{GDP_{Max} - GDP_{Min}}$$

**GDP per capita is used*

$$All_{NUTS3} = API_{NUTS3} \times GDP'_{NUTS3}$$



Production pipeline

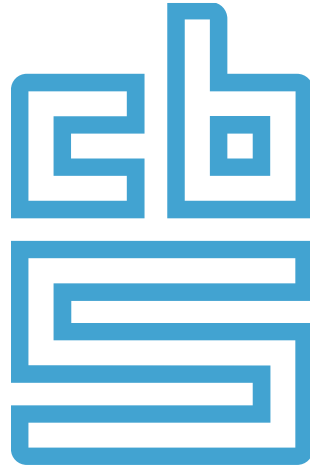


Dashboard demo

[Go to dashboard:](#)



Thank you for listening!



Facts that matter