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### **SDG GROUPS UPDATE & PARTNER ENGAGEMENT:** INDICATOR 11.6.2



https://ec.europa.eu/regional policy/sources/docgener/focus/2012 01 citv.pdf



# What is SDG Indicator 11.6.2 & the SMURBS approach?

- Indicator 11.6.2: "Annual mean levels of fine particular matter (e.g. PM<sub>2.5</sub> and PM<sub>10</sub>) in cities (population weighted)"
- Tier 1: conceptually clear, established methodology, standards available, & data regularly produced by countries. Custodian Agency: WHO
- UN approach produce an aggregated mean for **each country**:

Annual mean levels = 
$$\frac{\sum C_n \times P_n}{\sum P_n}$$



- Applies to an entire geographic area (country), C = estimated annual mean concentration of PM<sub>2.5</sub> and P = population
- SMURBS aims at cities adopting the Functional Urban Area (FUA) concept [OECD & EC]
- FUA = the urban centre (at least 50,000 inhabitants) + it's commuting zone

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OBSERVATIONS

- **SMURBS city-scale algorithm**: If the country has 10 cities,  $(C_1xP_1 + C_2P_2 + ... + C_{10}P_{10}) / (P_1 + P_2 + ... P_{10})$ , where  $C_1$  is the annual concentration average of a city (mean concentration value of pixels within the FUA) and  $P_1$  is the FUA<sub>1</sub> population
- Produces equivalent, directly comparable numbers to the official reported values for Indicator 11.6.2
- SMURBS added-value: beyond simply monitoring, identification of cities hot-spots enables targeted mitigation measures to lower the actual indicator







### Calculation of SDG Indicator 11.6.2

- Copernicus Atmospheric Monitoring Service (CAMS) & Copernicus Land Monitoring Service (CLMS)
- CAMS regional ensemble reanalysis (includes PM<sub>2.5</sub> conc.) masked using CLMS FUA shapefile (includes boundaries & population)





- Create subset of original array. Then average across all values to derive the C<sub>1</sub> & multiply with FUA shapefile P<sub>1</sub>
- Repeat for remaining FUAs in a country for the additional C & P of each FUA





 $\frac{(C_{FUA1}P_{FUA1} + C_{FUA2}P_{FUA2} + \dots + C_{FUAn}P_{FUAn})}{(C_{FUA1}P_{FUA1} + C_{FUA2}P_{FUA2} + \dots + C_{FUAn}P_{FUAn})}$ Annual mean levels = P<sub>total</sub>



Output





Input



## SMURBS SDG 11.6.2 Platform: Data Visualization & City View



Horizon 2020 Call: H2020-SC5-2015-one-stage Topic: SC5-IS-2015 Type of action: ERA-NET-Cofund Grant agreement no: 689443 Proposal acronym: ERA-PLANET







#### Next Steps



- Platform development, targeting the GEO Ministerial
- SDG 11.6.2 Technical Document in production
- Utilize European in-situ network (EEA)
- Utilize city-scale modeling (& satellites?)
- Continuous collaboration with GEOEssential, VLAB, JRC, U-TEP, EO4SDGs, and others



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### SDG 11.6.2: SMURBS Approach



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