Dynamic Evaluation using Forecast Simulations

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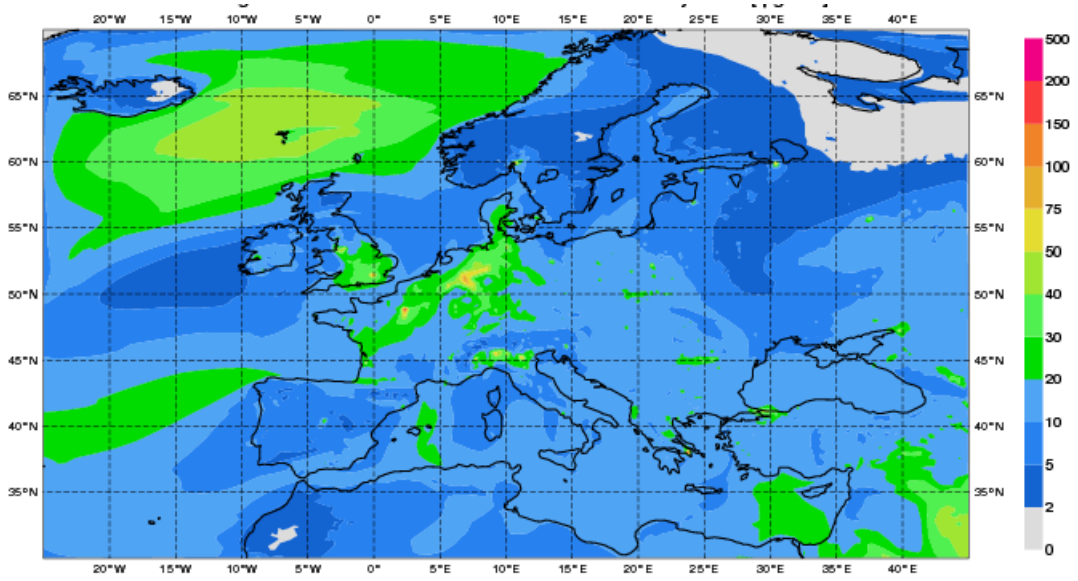
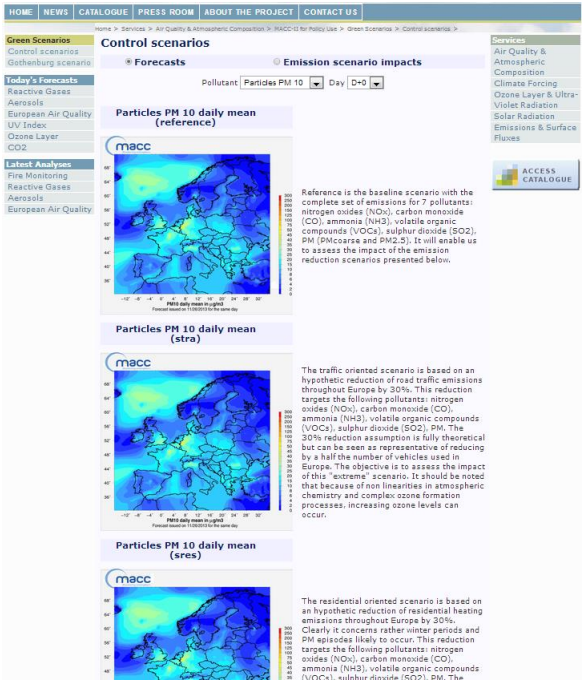
Green scenarios: Context

- MACC-II regional services produce daily air quality forecasts allowing to inform up to four days ahead about the ambient concentrations of ozone, nitrogen dioxide and particulate matter (PM10 and PM2.5) for the whole of Europe.

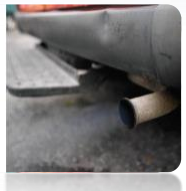


Green scenarios: Objectives



- The MACC-II green scenario products are intended to help policy users in the design of relevant policy responses to prevent severe air pollution episodes.
- The toolbox provides daily regular information on the expected effect that
  - short term measures on various emission sources may have on the forecasted pollution episodes (**control scenario**).
  - long-term measures linked to the Gothenburg emission reduction commitments may have on air quality (**Gothenburg scenario**).

Control scenarios



- Four control scenarios have been designed that target various emission sectors:
  - road traffic
  - residential heating
  - Agriculture
  - Industrial activities
- a theoretical abatement of a certain percentage of emissions is applied on these emissions sectors
- Theoretical abatements mean no real measures behind these scenarios even if the magnitude of these emission reductions has been designed as feasible.

Monitoring atmospheric composition & climate – II

Control scenarios definitions:

Traffic (stra)

Residential heating (sres)

Agricultural (sagr)

Industrial (sind)

SNAP sectors

- **S1 - Combustion in energy and transformation industries – 30 %**
- **S2 - Non-industrial combustion plants – 30 %**
- **S3 - Combustion in manufacturing industry - 30%**
- **S4 - Production processes -30%**
- S5 - Extraction and distribution of fossil fuels and geothermal energy
- S6 - Solvent use and other product use
- **S7 - Road transport – 30 %**
- S8 - Other mobile sources and machinery
- S9 - Waste treatment and disposal
- **S10 – Agriculture – 30%**
- S11 - Other sources and sinks

Relative Potential

Emission reduction of α%: $$\pi = \frac{C_{E_\alpha} - C_{E_{0\%}}}{\alpha C_{E_{0\%}}}$$

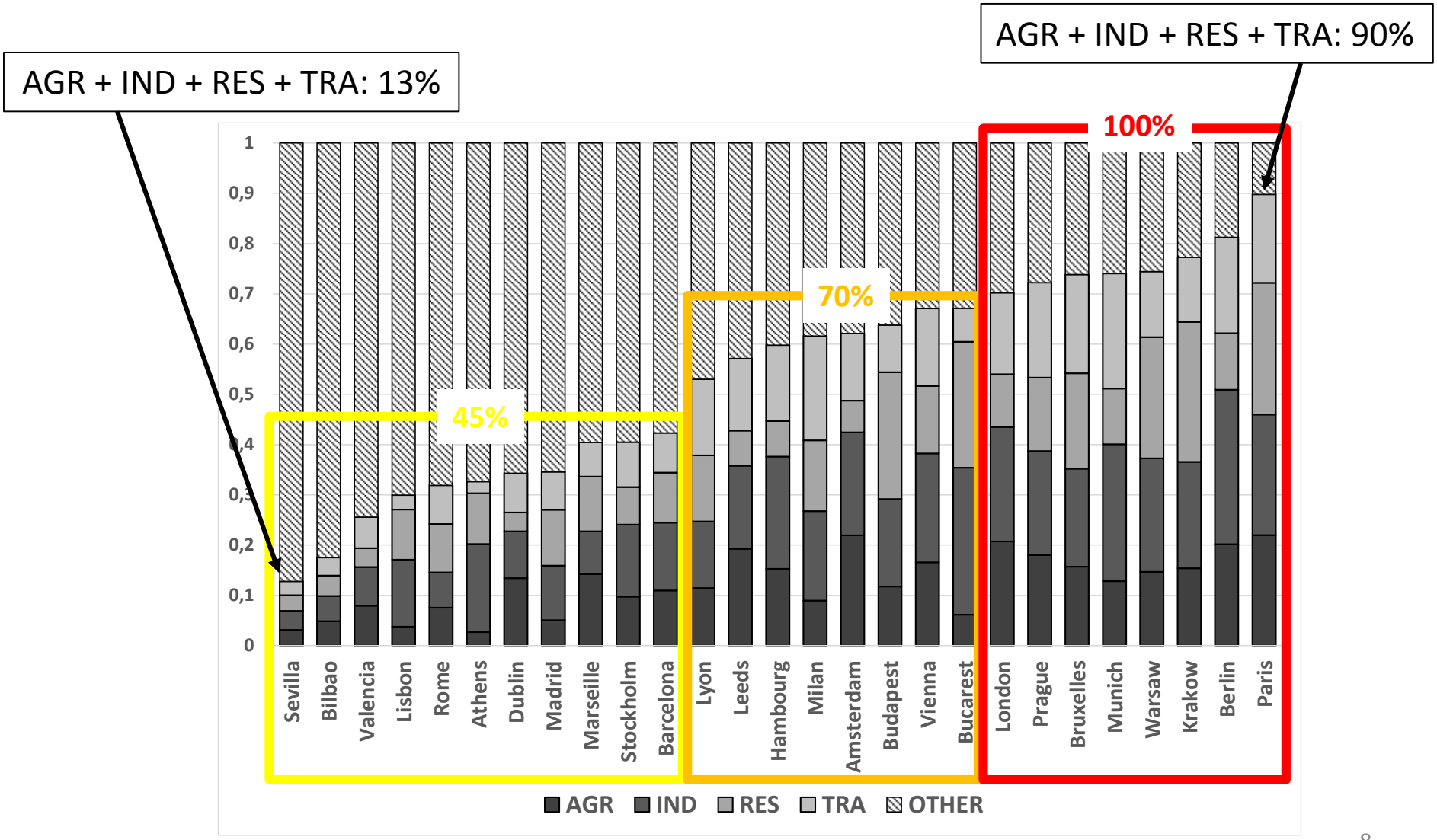
Calculation of relative potentials for 4 aggregated activity sectors:

- Industry (IND), α=10%
- Transport (TRA),), α=30%
- Residential (RES)), α=30%
- Agriculture (AGR)), α=30%

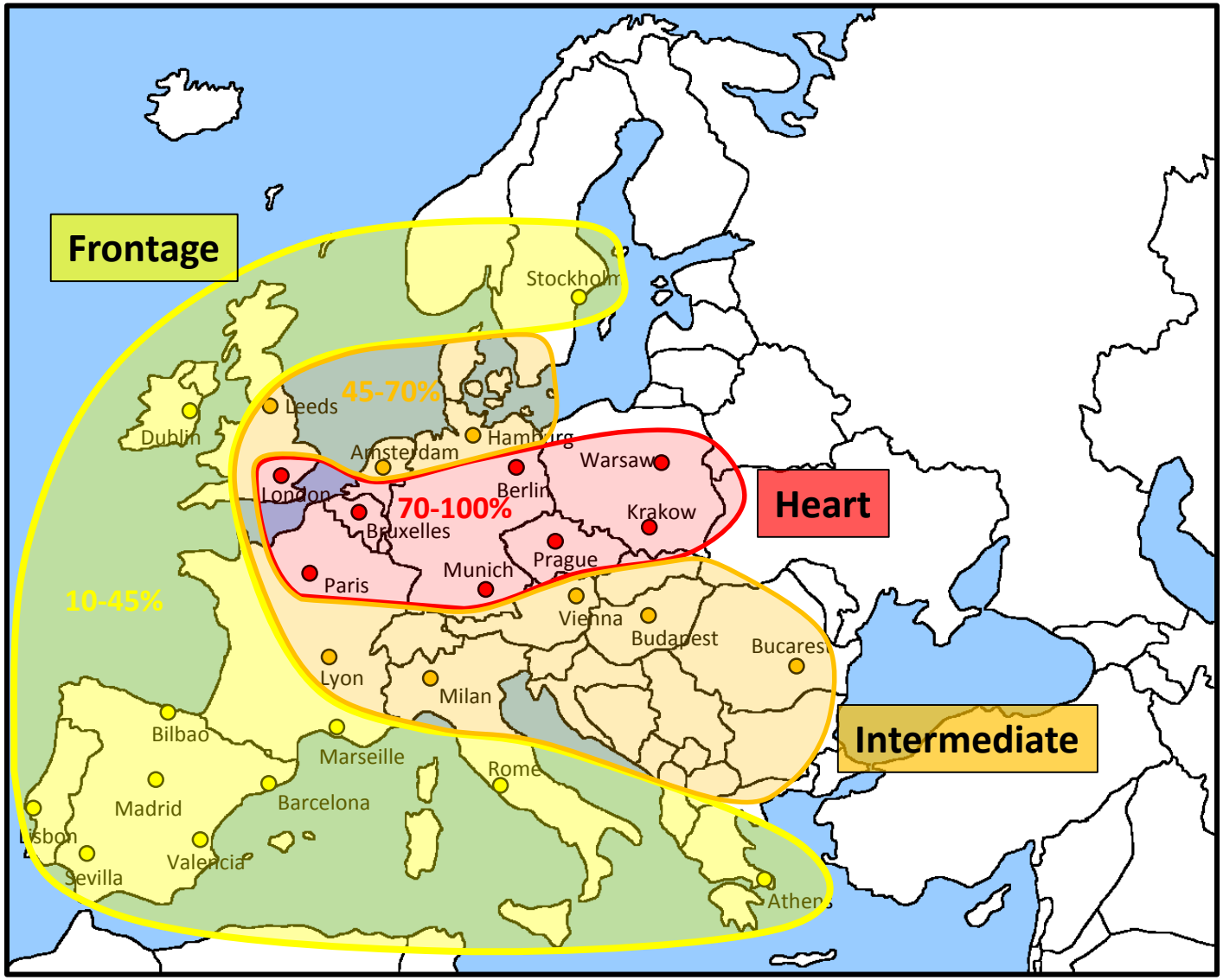
Different European Cities

Calculation of relative potentials for **27 European cities**.

Relative Potential

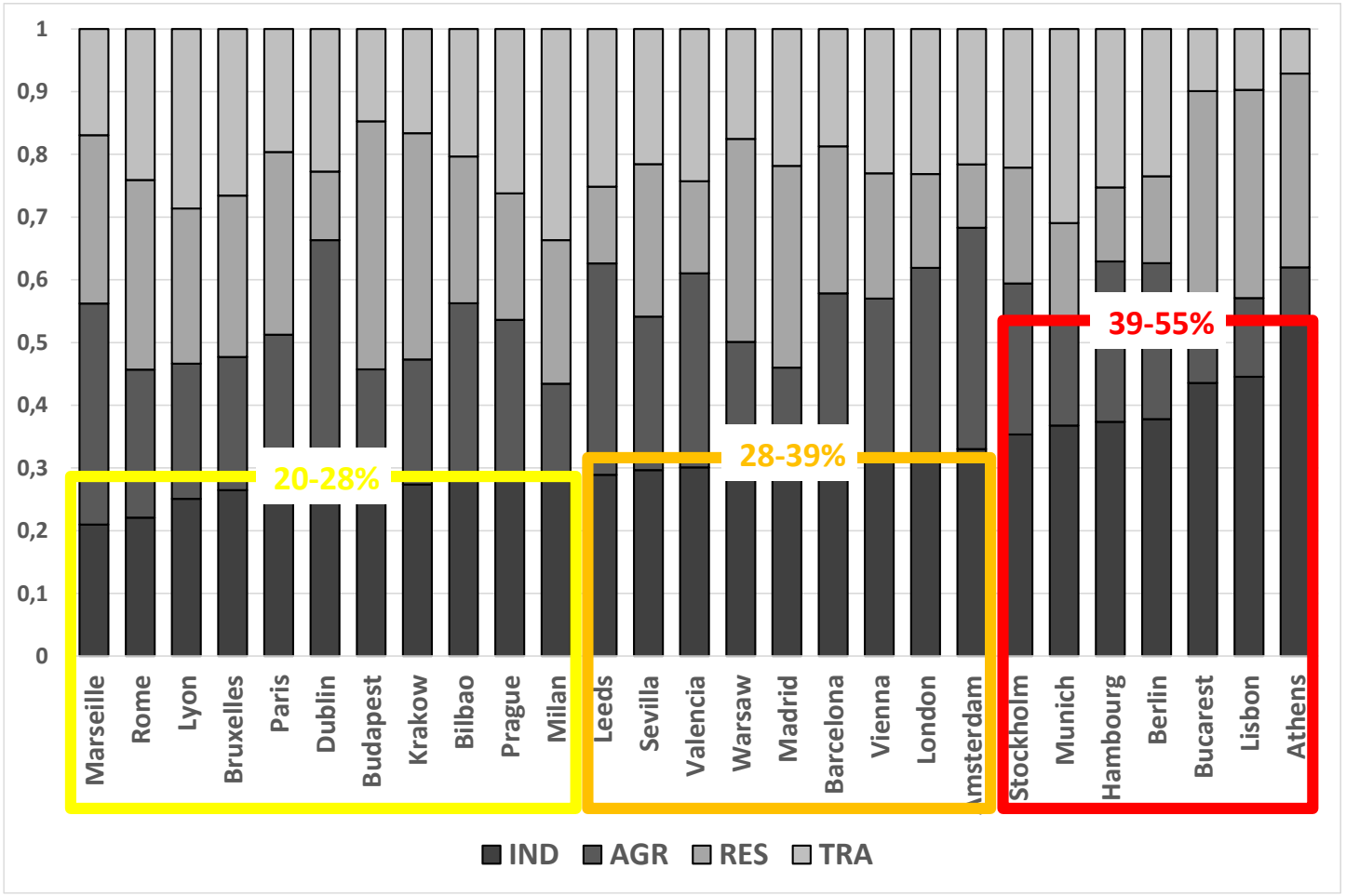


Contribution: ALL (=1-OTHER)

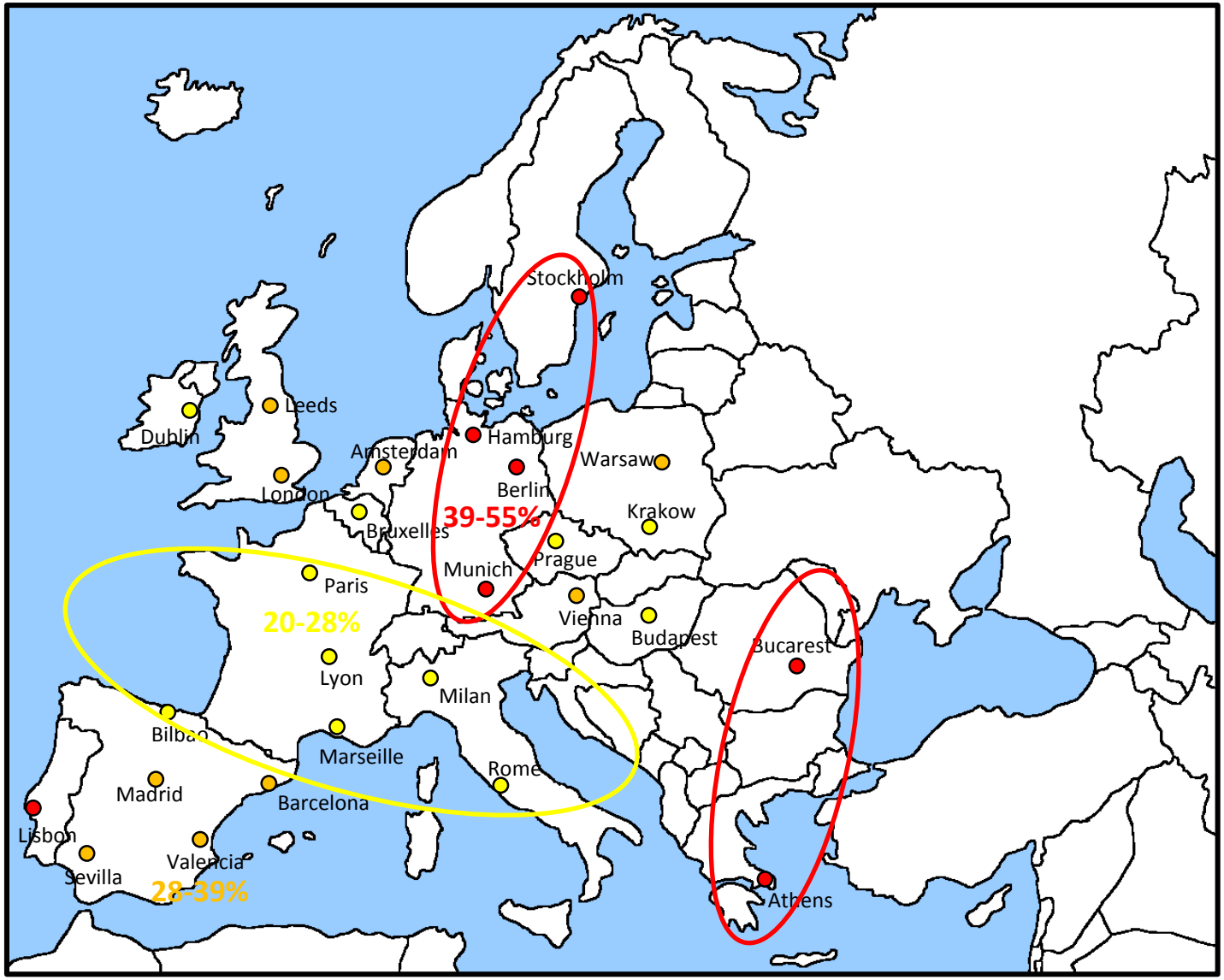


Contribution: IND

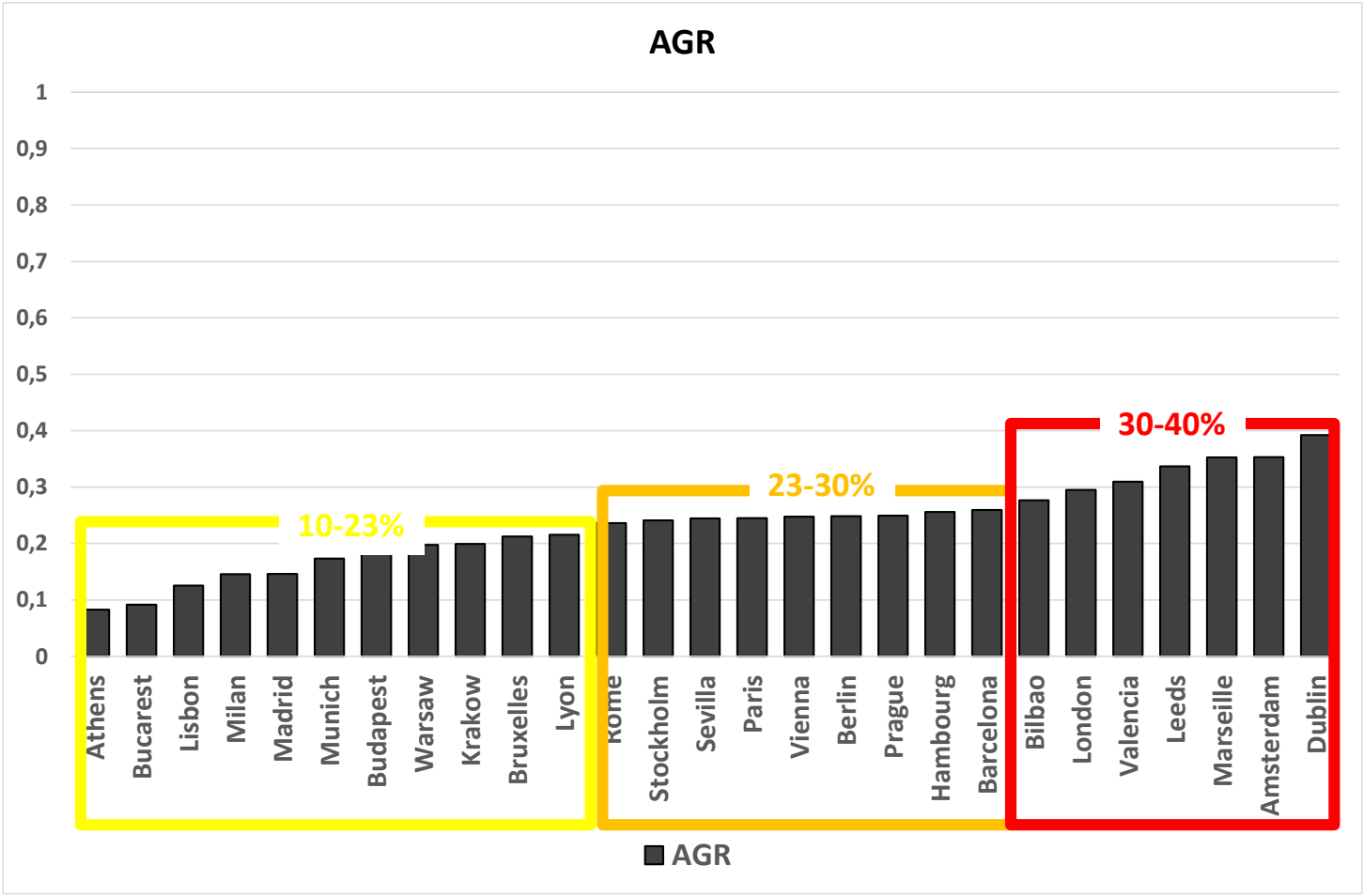
In average; IND: 32% ; AGR 23% ; RES 23% ; TRA 21%



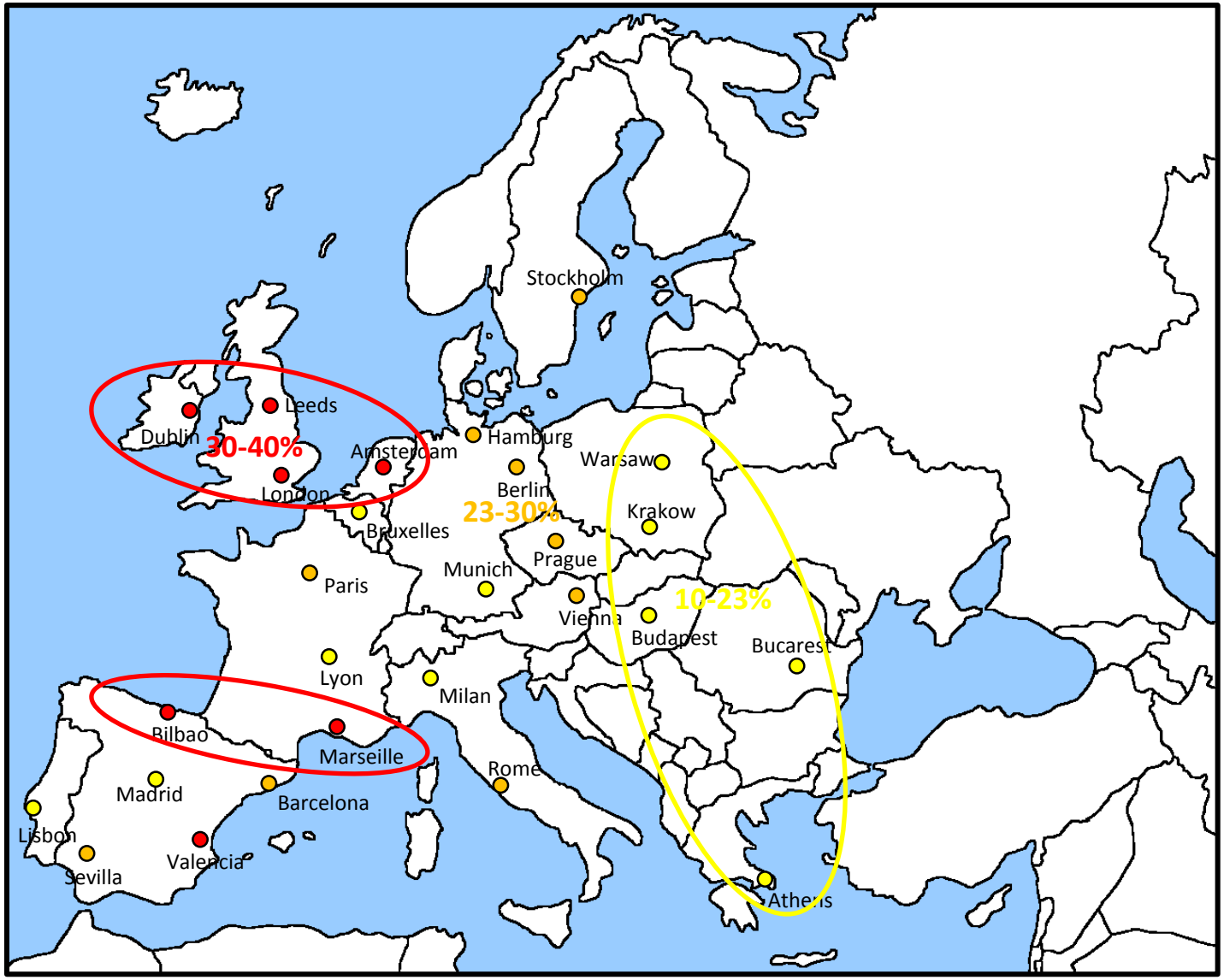
Contribution: IND



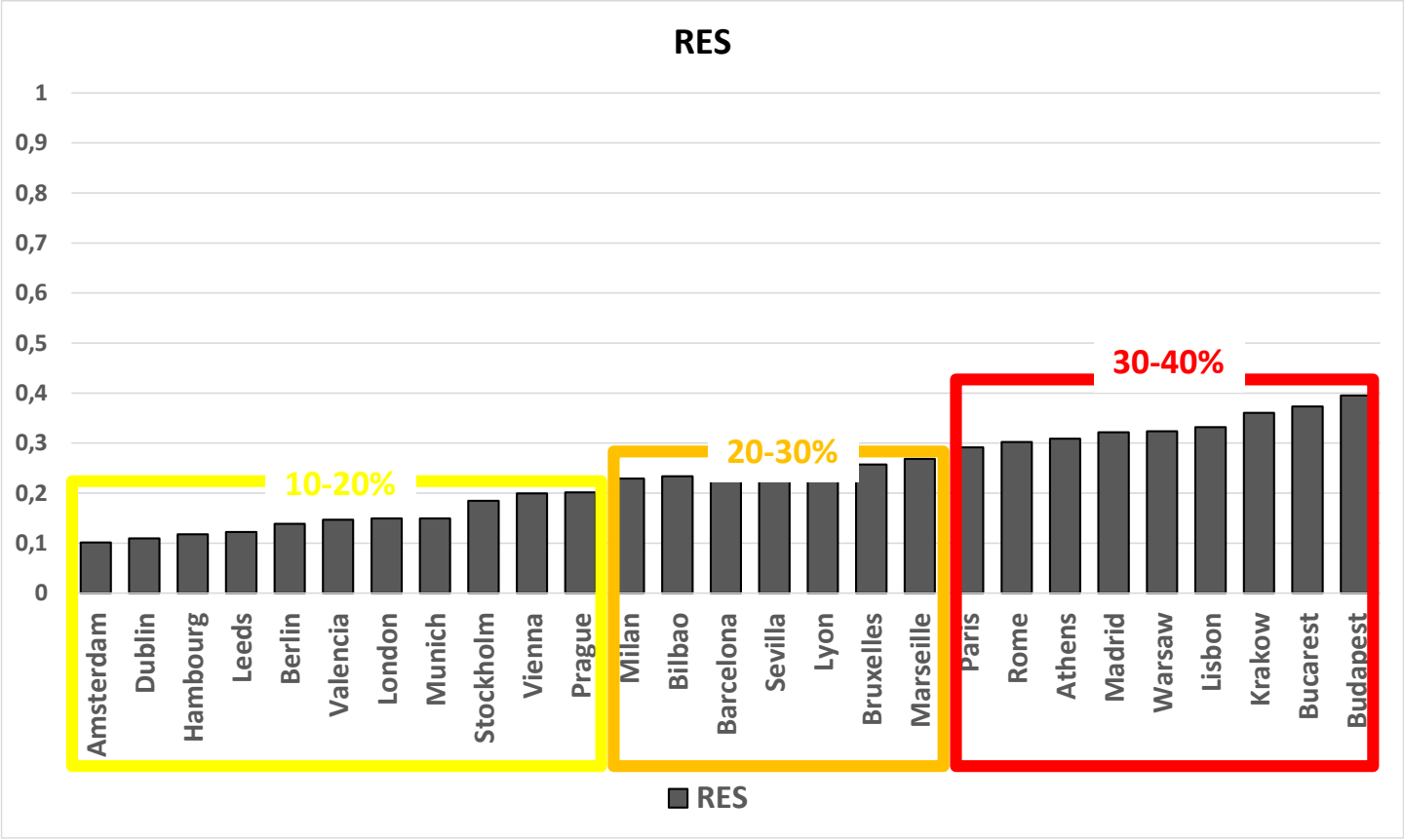
Contribution: AGR



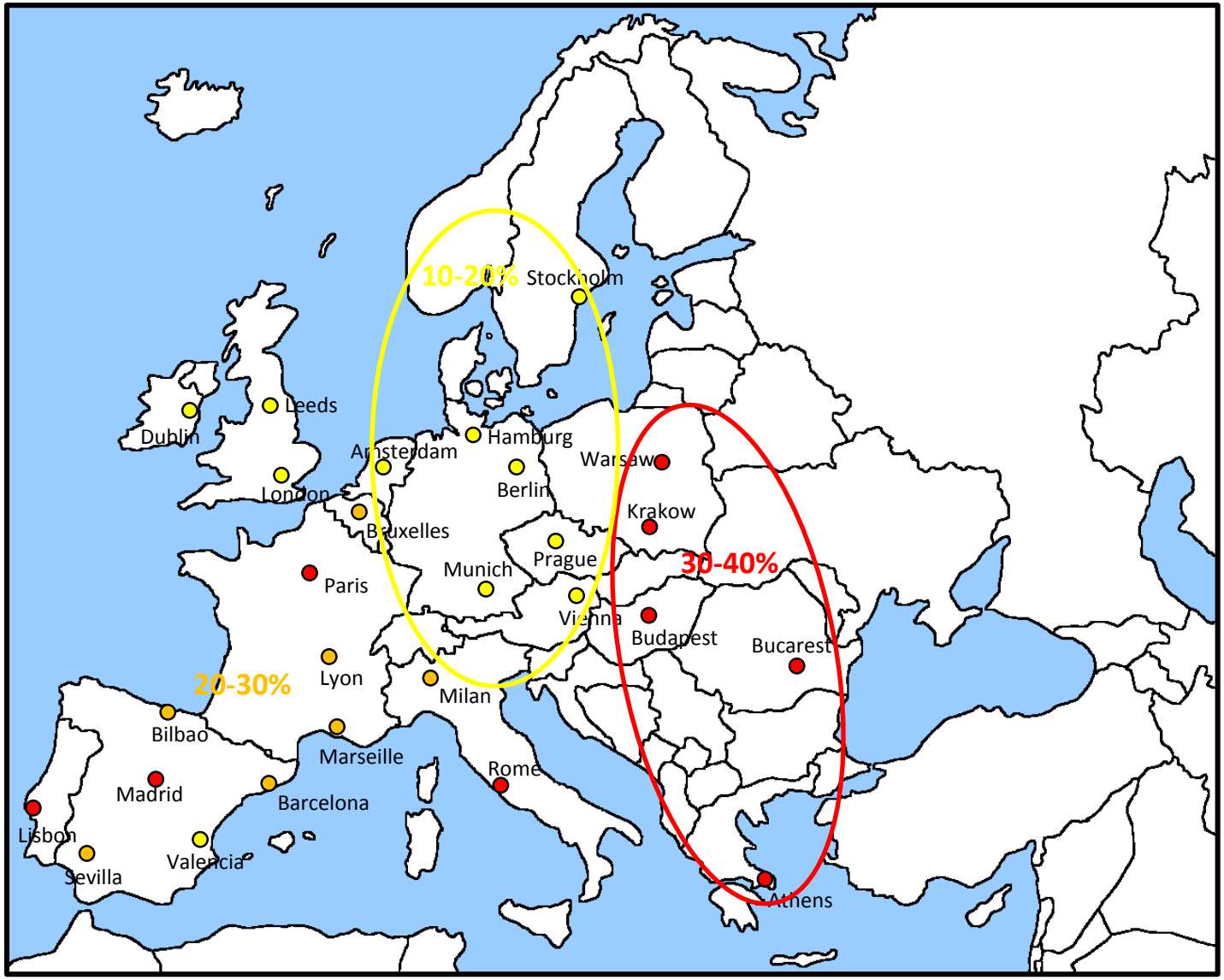
Contribution: AGR



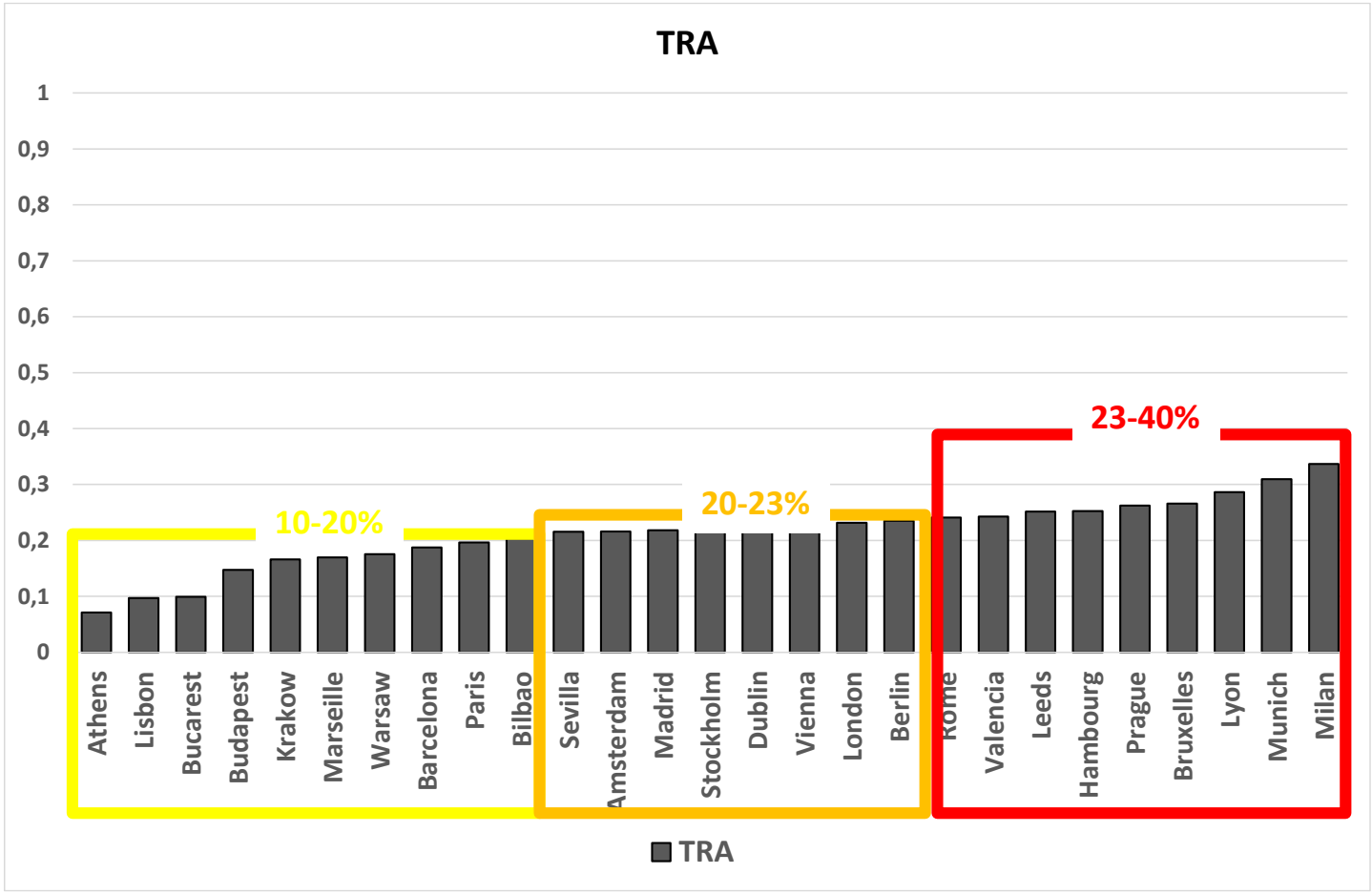
Contribution: RES



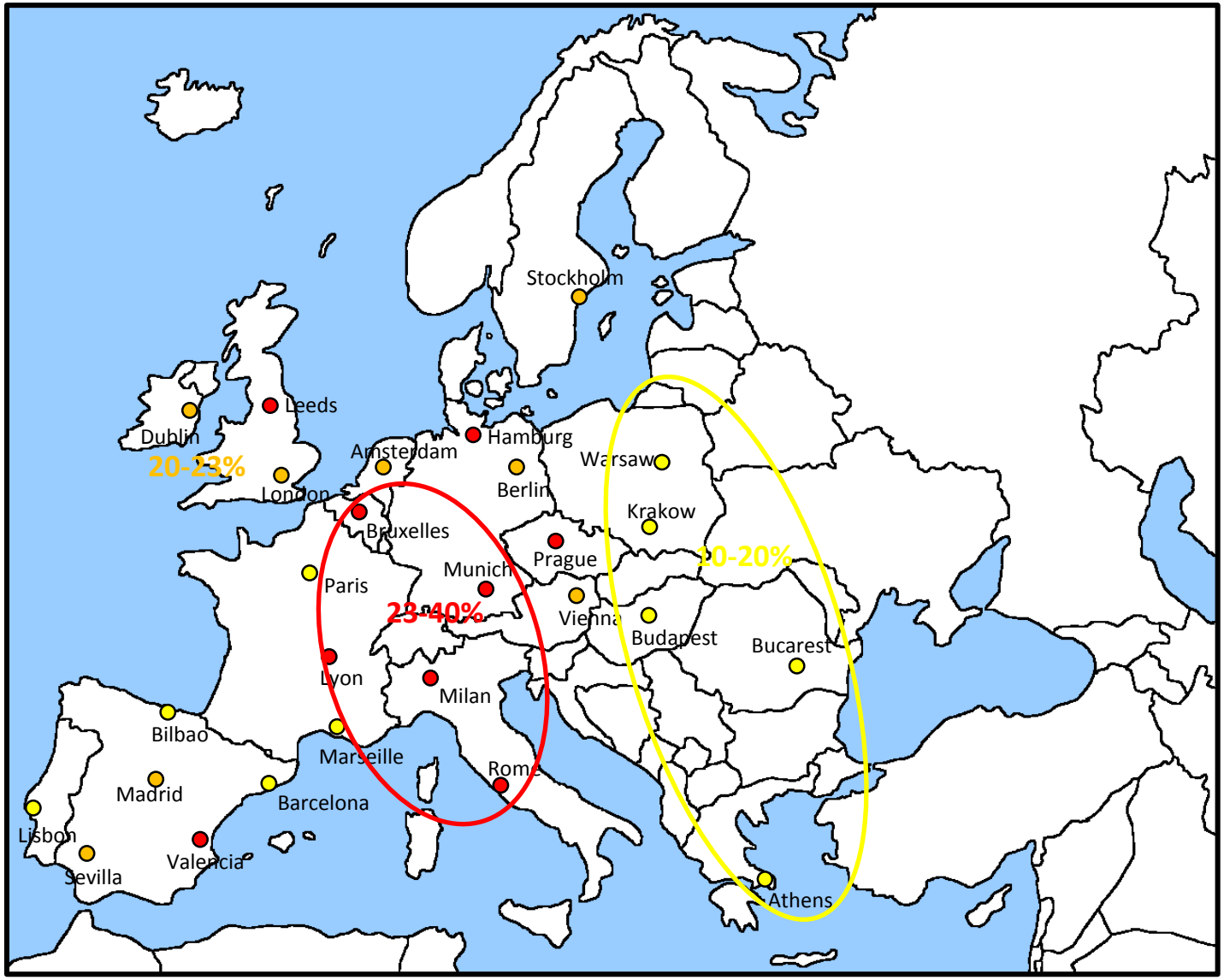
Contribution: RES



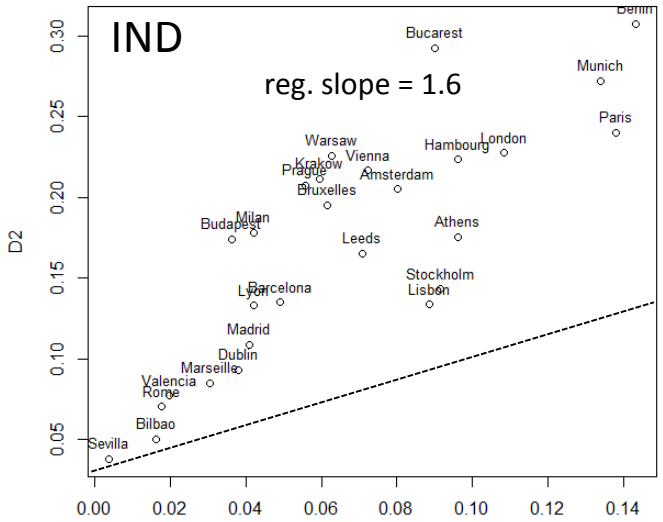
Contribution: TRA

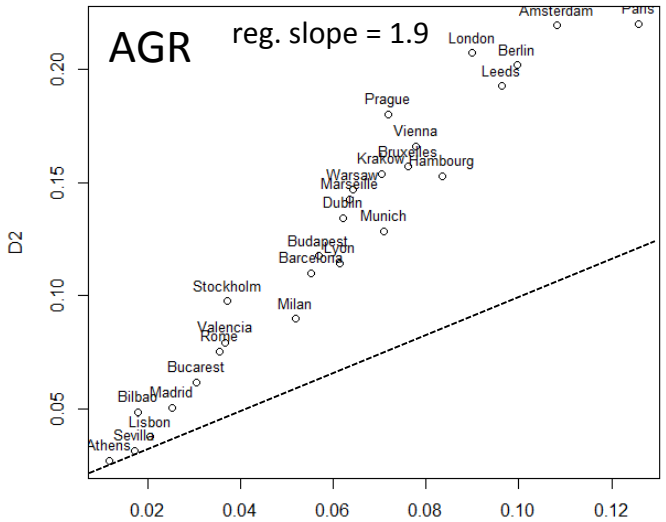


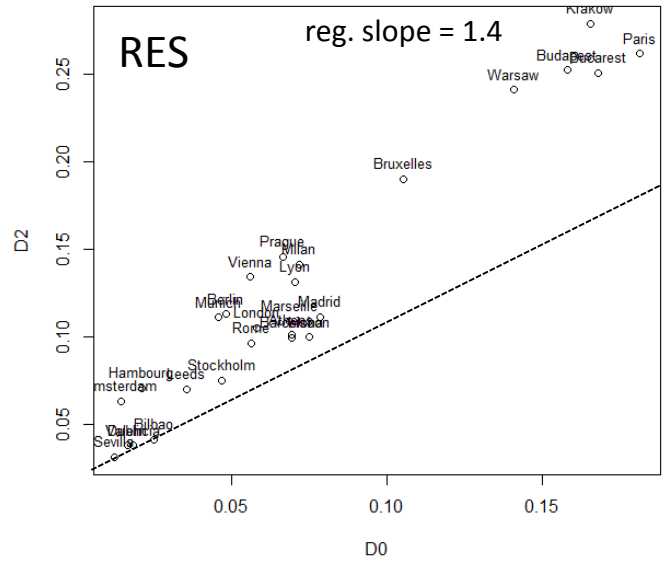
Contribution: TRA

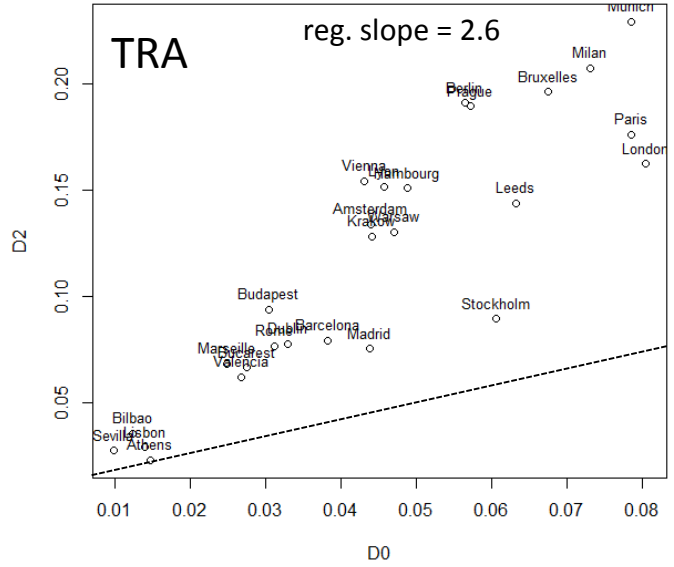


D0 vs. D2


IND
reg. slope = 1.6
D2
0.00 0.02 0.04 0.06 0.08 0.10 0.12 0.14
0.05 0.10 0.15 0.20 0.25 0.30
Bucarest
Munich
Paris
Warsaw
Krakow
Vienna
Prague
Hamburg
London
Amsterdam
Bruxelles
Budapest
Milan
Athens
Leeds
Stockholm
Lisbon
Barcelona
Lyon
Madrid
Dublin
Marseille
Valencia
Rome
Bilbao
Sevilla


AGR
reg. slope = 1.9
D2
0.02 0.04 0.06 0.08 0.10 0.12
0.05 0.10 0.15 0.20
Amsterdam
Paris
London
Berlin
Leeds
Prague
Vienna
Bruxelles
Krakow
Hamburg
Warsaw
Marseille
Dublin
Munich
Budapest
Lyon
Barcelona
Stockholm
Milan
Valencia
Rome
Bucarest
Bilbao
Madrid
Lisbon
Sevilla
Athens


RES
reg. slope = 1.4
D2
D0
0.05 0.10 0.15
0.05 0.10 0.15 0.20 0.25
Krakow
Paris
Budapest
Bucarest
Warsaw
Bruxelles
Prague
Milan
Vienna
Lyon
Madrid
Marseille
Rome
Stockholm
Hamburg
Leeds
Bilbao
Sevilla


TRA
reg. slope = 2.6
D2
D0
0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08
0.05 0.10 0.15 0.20
Milan
Bruxelles
Paris
London
Vienna
Hamburg
Leeds
Amsterdam
Krakow
Budapest
Stockholm
Barcelona
Madrid
Marseille
Valencia
Bilbao
Sevilla
Lisbon
Athens


Thank you for your attention