

Modelling the Effects of Megacity Emissions on Atmospheric Chemistry

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Motivation

- Global Model / Global Emissions Inventory
 - Combined effect of all megacities
 - Long range transport of pollutants

Outline

- Part One: The Emissions
 - Background on emissions inventories
 - Identification of megacities
 - Differences between inventories
- Part Two: The Effects
 - Methodology
 - Effect of cities
 - Differences between inventories
- Conclusions

Part One: The Emissions

Global Emissions Inventories

- Activity data for each country/sector
- Emissions factors
- Gridded distribution for each country/sector

Which Inventories?

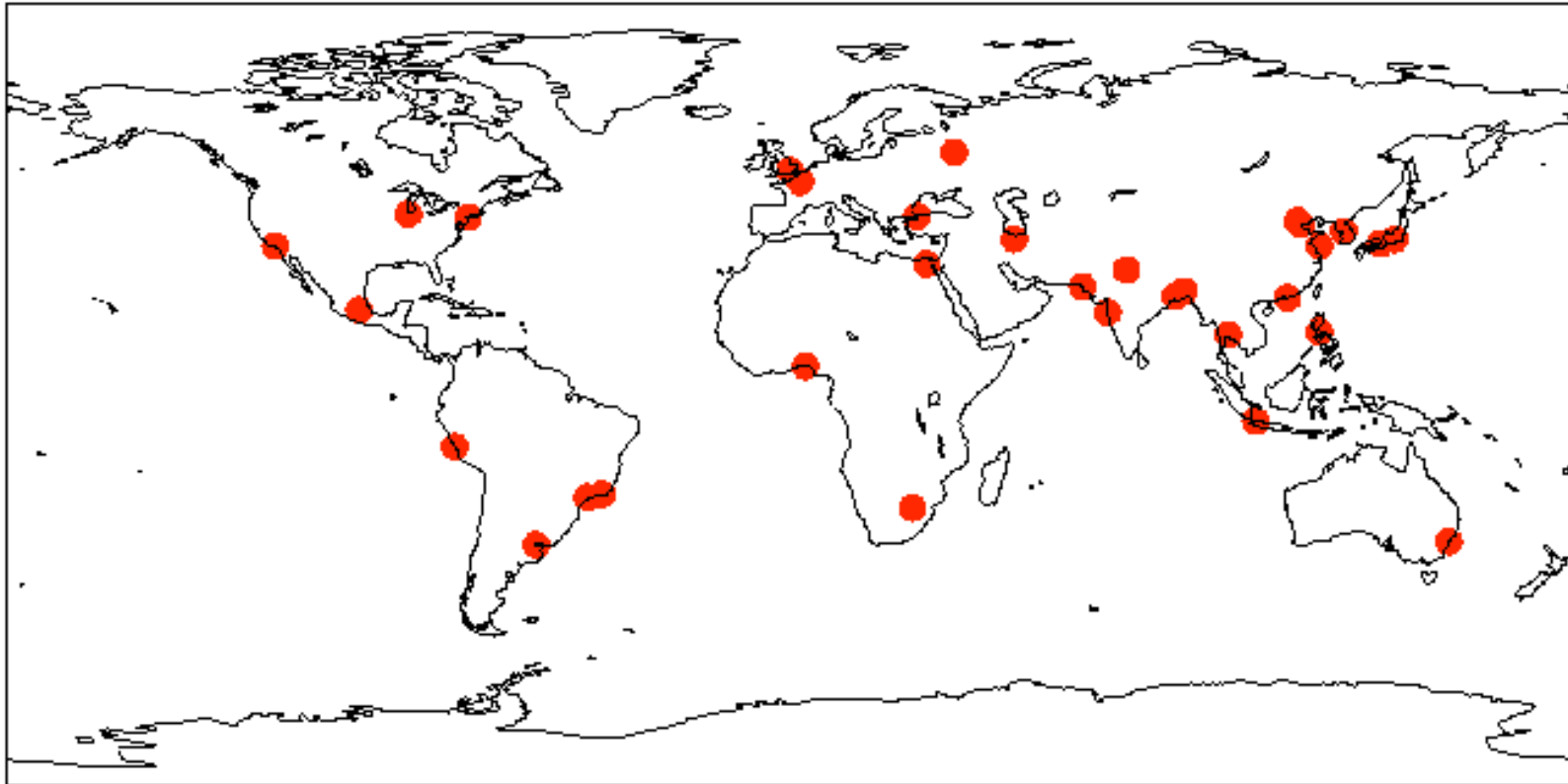
- EDGAR Fast Track 2000
- EDGAR/IIASA (IPCC AR4 Intercomparison)
- RETRO (The RETRO project)

Distribution of Emissions

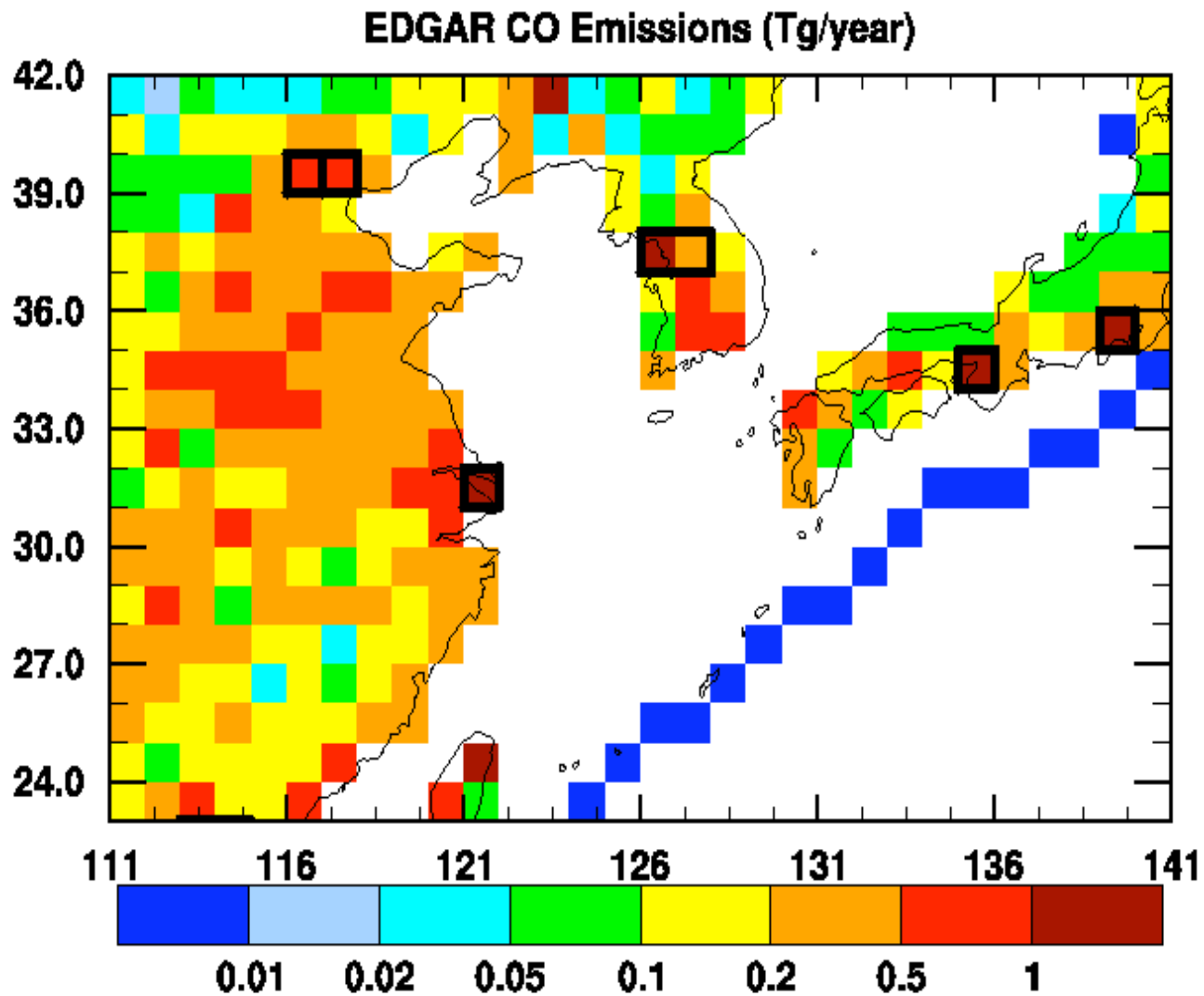
Sector	Distribution
Fossil Fuel Extraction and Processing	Facilities
Power Generation – USA and Europe	Facilities
Power Generation – Elsewhere	Total Population
Road Traffic	Total Population
Residential and Commercial Biofuel Combustion	Rural Population
Residential and Commercial Charcoal Combustion	Urban Population

Table 1: Geographical distribution of various sectors in the EDGAR inventory

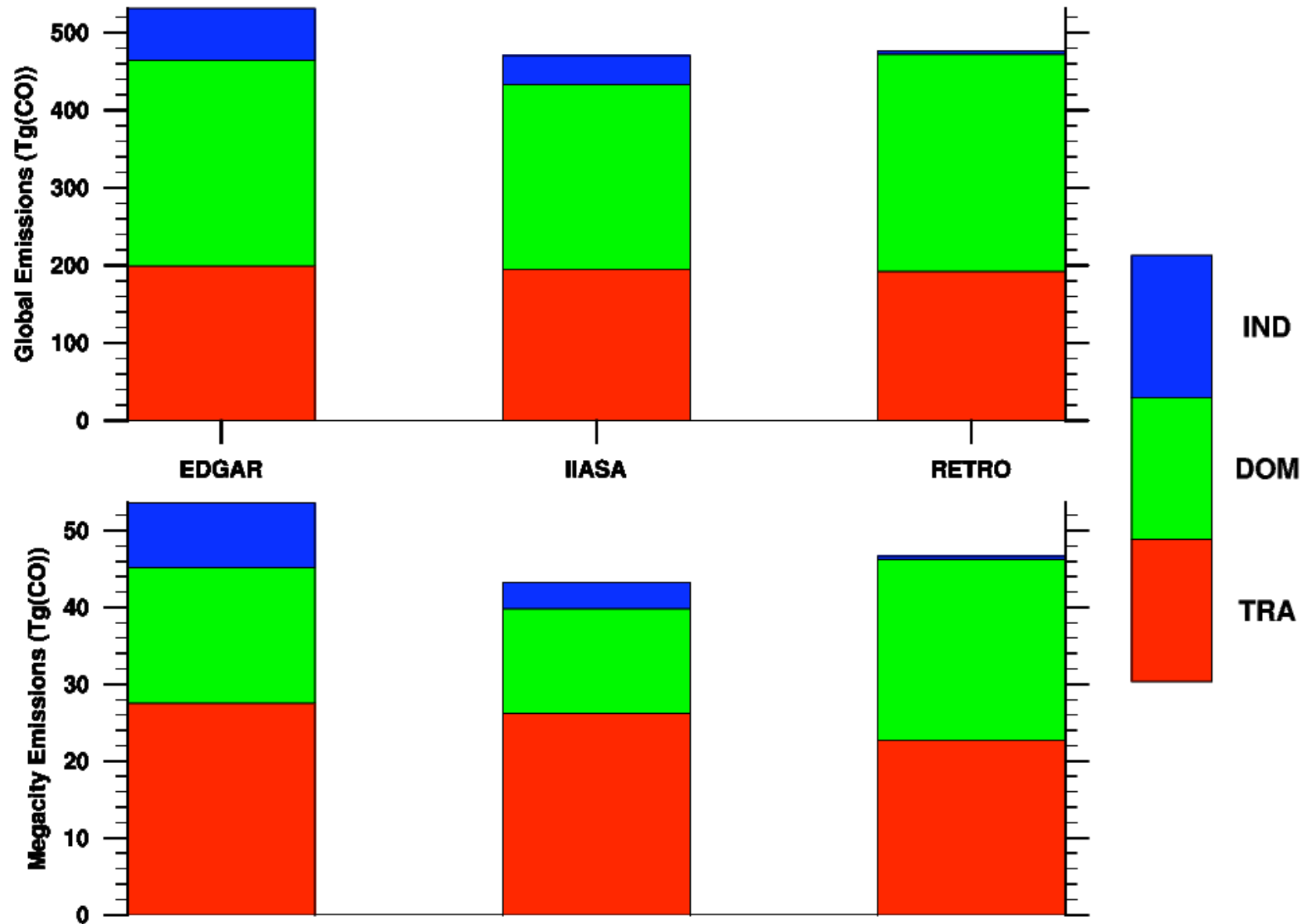
Which Megacities?



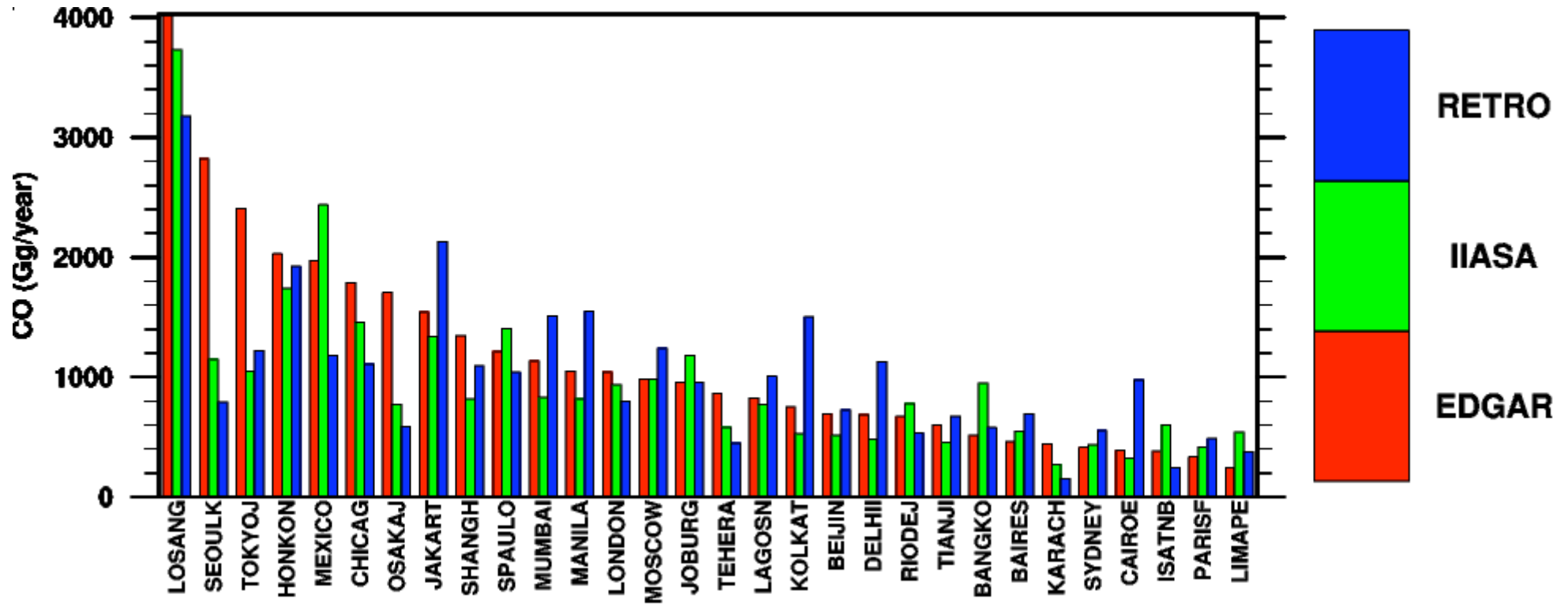
Megacity Grid Cells



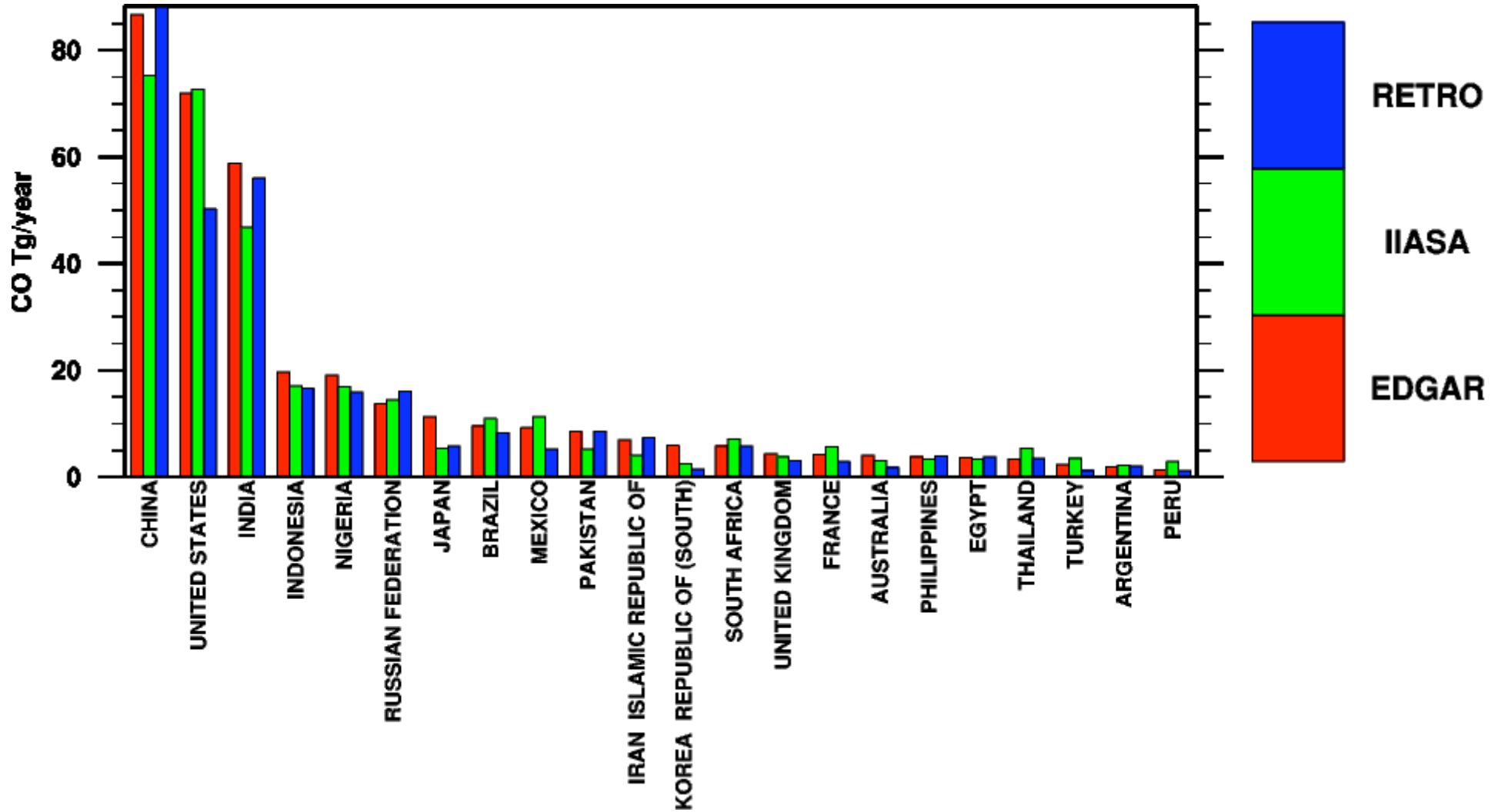
Total Global/Megacity Emissions



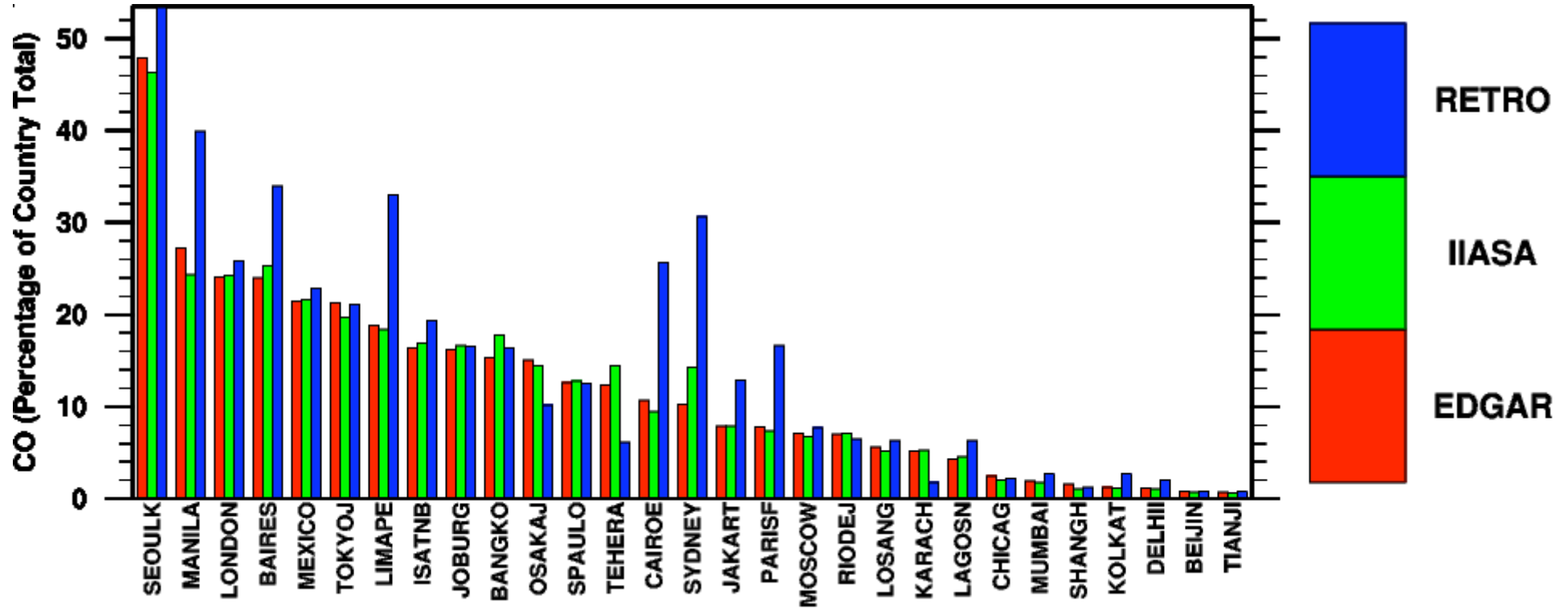
Individual Cities



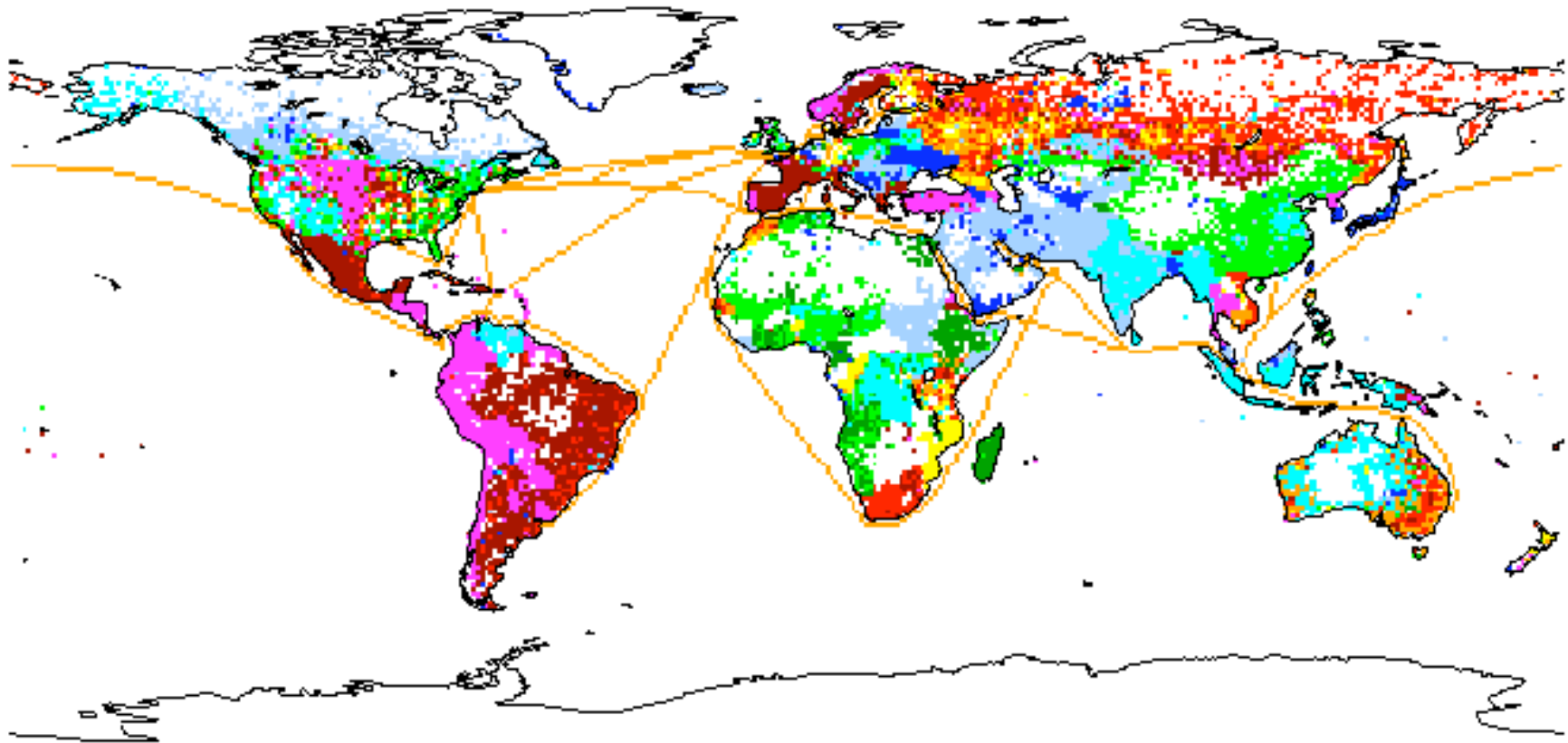
Individual Countries



Percentage of Country Total



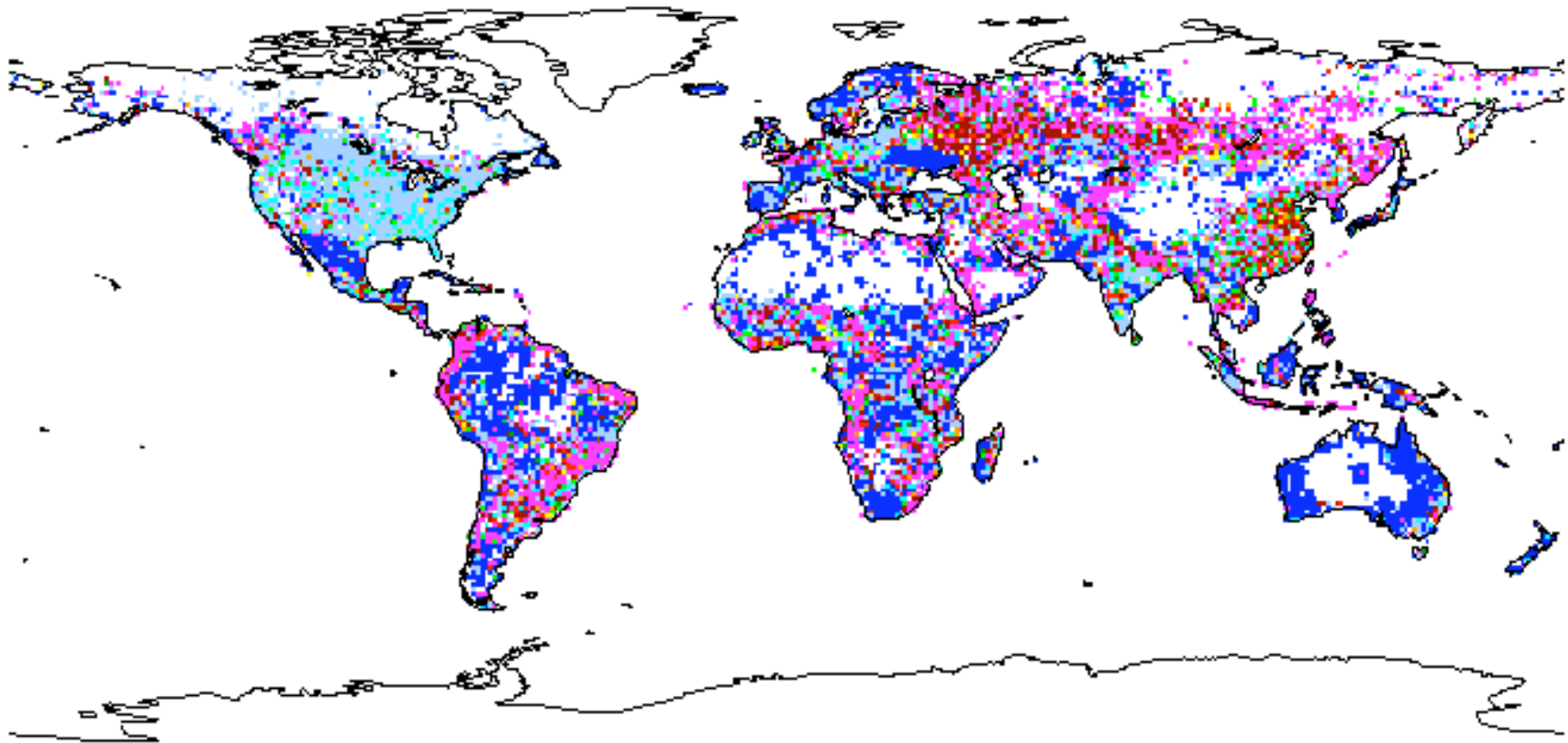
CO Emissions Difference: EDGAR vs IIASA



-50 -20 -10 -5 -2 2 5 10 20 50

Percentage difference

CO Emissions Difference: EDGAR vs RETRO



-50 -20 -10 -5 -2 2 5 10 20 50

Percentage difference

Part Two: The Effects

Part Two contains unpublished results which we would like to withhold at this time. Please contact me directly with any questions:
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...Conclusions.

- Differences between inventories can be large at the country level
- Differences in Megacity emissions can also be due to the geographical emissions distributions within each country