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What is a city?

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What is a city?

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1.City definition – what for?

- Delimiting a system boundary (e.g. for modelling purposes)
- Comparing various indicators within a city and among cities (e.g. energy consumption, GHG emissions per capita)[1]:

'Production' accounting	Applying national energy (or GHG inventory) reporting formats to the urban scale and to urban administrative boundaries	Some data available
'Consumption' accounting	Apportioning energy uses to urban consumers (per unit of urban consumer expenditures), including direct and embodied energy, both within and outside the city's administrative boundary)	Very limited data available

2.Challenges of setting a city boundary[2,3]

There is not one universal definition of urban vs. rural population, neither on city vs. urban area. Examples of a large difference between countries are: Shanghai city, which also comprises farmland; London, which does not include the metropolitan region in its city specification.
The most common criteria of city definition include one or more of the following:
- administrative/legal aspects (population, physical boundary, functional, "continuously built-up" areas)
- economic links between the main city and neighbouring areas
- customary (historical, e.g. through a charter)
It is also challenging to define where a city physically begins and ends and how to assign the energy infrastructure to a specific city.
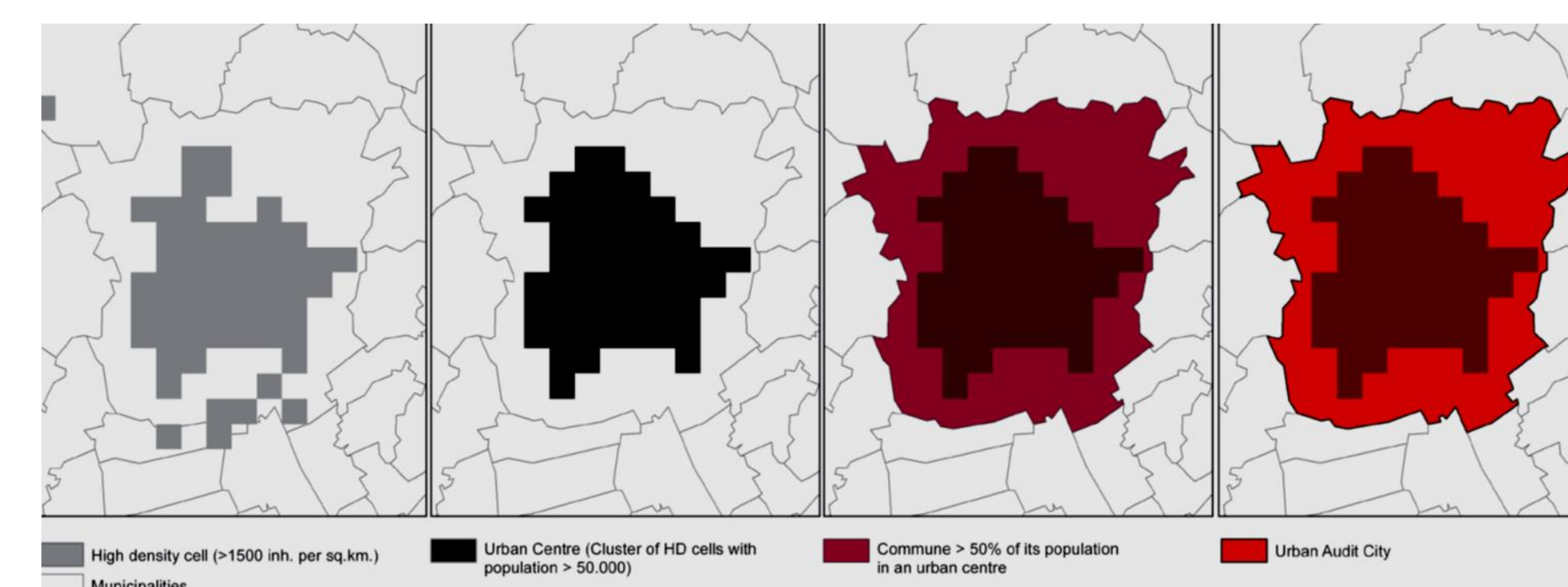
3.UN's definition of a city[4]

Urban agglomeration: "population contained within the contours of contiguous territory inhabited at urban levels of residential density"
Metropolitan region: "includes both the contiguous territory inhabited at urban levels of residential density and additional surrounding areas of lower settlement density that are also under the direct influence of the city"

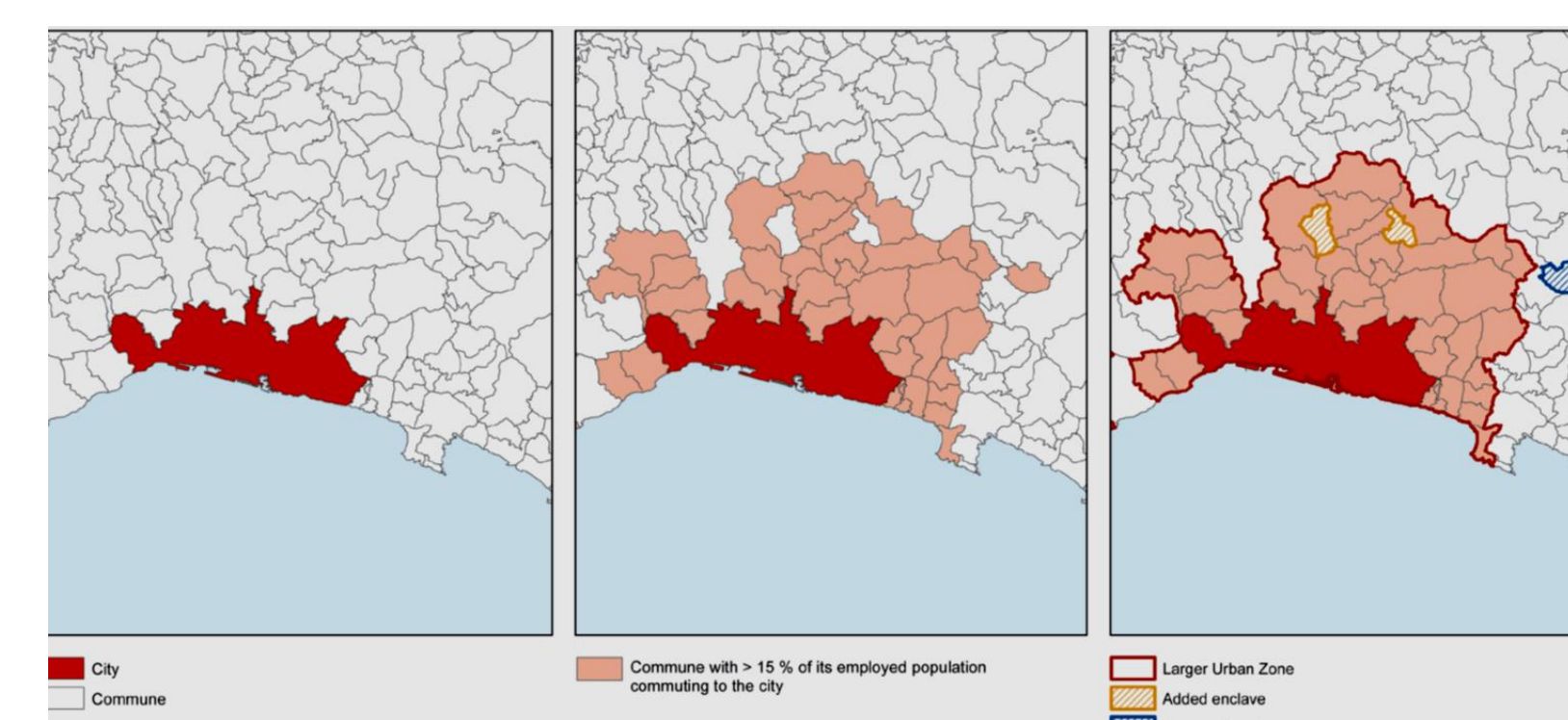## 4.Urban areas as "functional economic units"[3,5]

OECD & European Commission's definition of a city and its commuting zone
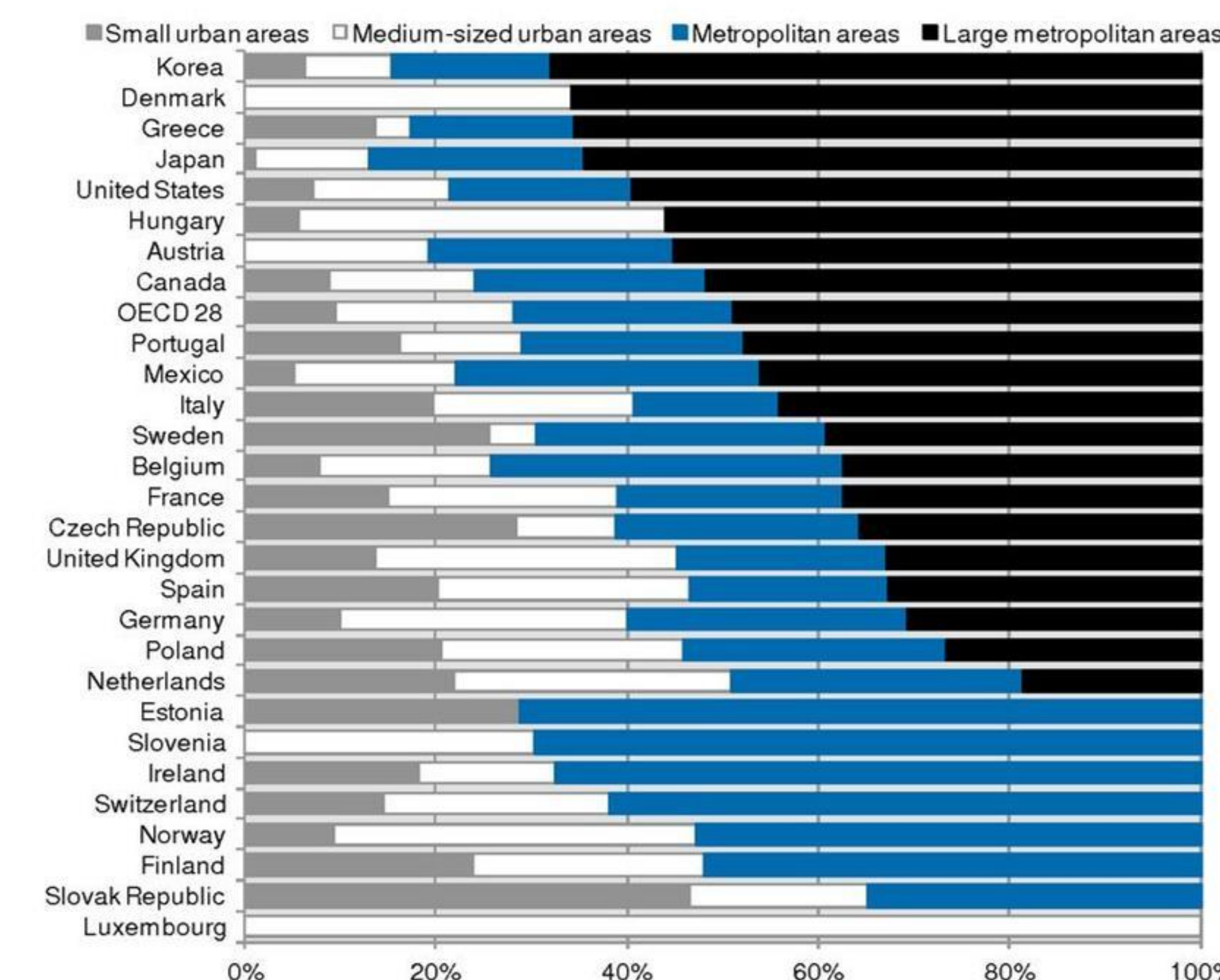
Defining a city (urban core)

- Ignoring administrative borders and selecting all grid cells exceeding 1500 people/km^2 (1000 in the US and Canada)
- Clustering of bordering high-density cells and defining 'urban centre' as clusters containing at least 50 000 inhabitants
- Incorporating municipalities (Eurostat's local administrative level 2) that have 50% of their population within the urban centre
- Only for European cities (Urban Audit Cities): considering how areas are linked politically, making sure that ≥50% of inhabitants live in the urban centre and ≥ 75% of inhabitants of the urban centre live in the (Urban Audit) city
- For some cities a greater city level (with bigger urban centres) is created

Defining a commuting zone (hinterland)

- Cities as defined in previous step
- Municipalities with 15 % and more of their employed inhabitants working in the city are identified
- Two cities are treated as a single city, if 15 % of employees living in one of them work in the neighbouring city
- Municipalities within a single functional area are included and those outside are excluded

5.City size classification[5]

Small urban areas: up to 200 000 people
Medium sized urban areas: 200 000 - 500 000
Metropolitan areas: 500 000 - 1.5 million
Large metropolitan areas: 1.5 million and above

6.Discussion and preliminary conclusions

The OECD-European Commissions' definition is a good attempt at a unified city definition and comparison. Nonetheless, this approach requires updated census statistics – considering free movement of people around the EU, this can prove challenging. No detailed energy consumption data is available within this methodology, therefore a method allowing to apply the energy production and consumption data to the population grid data is required.

References

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