

# CentropeMAP and CentropoSTATISTICS – Cross-Border Thematic Mapping

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## 1 ABSTRACT

The Centrope region unites the territory near the common boundaries of Austria, the Czech Republic, Hungary, and the Slovak Republic. To enhance cross-border information exchange in municipal and regional planning, CentropoMAP was introduced in the year 2005 as a geoportal displaying datasets from the Centrope partner countries in a common interface and is subsequently extended in terms of content and functionality, thus allowing an easy view across the borders.

CentropoMAP is also the basis for the interactive cross-border statistics information system CentropoSTATISTICS which allows statistic figures from the fields of demography, economy, and land use to be compared with each other, analysed and graphically displayed.

CentropoSTATISTICS concentrates on data at municipality level, which is the major difference to other existing cross-border statistics portals which often present their data only on NUTS 3 or even NUTS 2 levels which is insufficient for a cross-border analysis on a small scale.

Keywords: Centrope, geodata, geoportal, statistical data, thematic maps

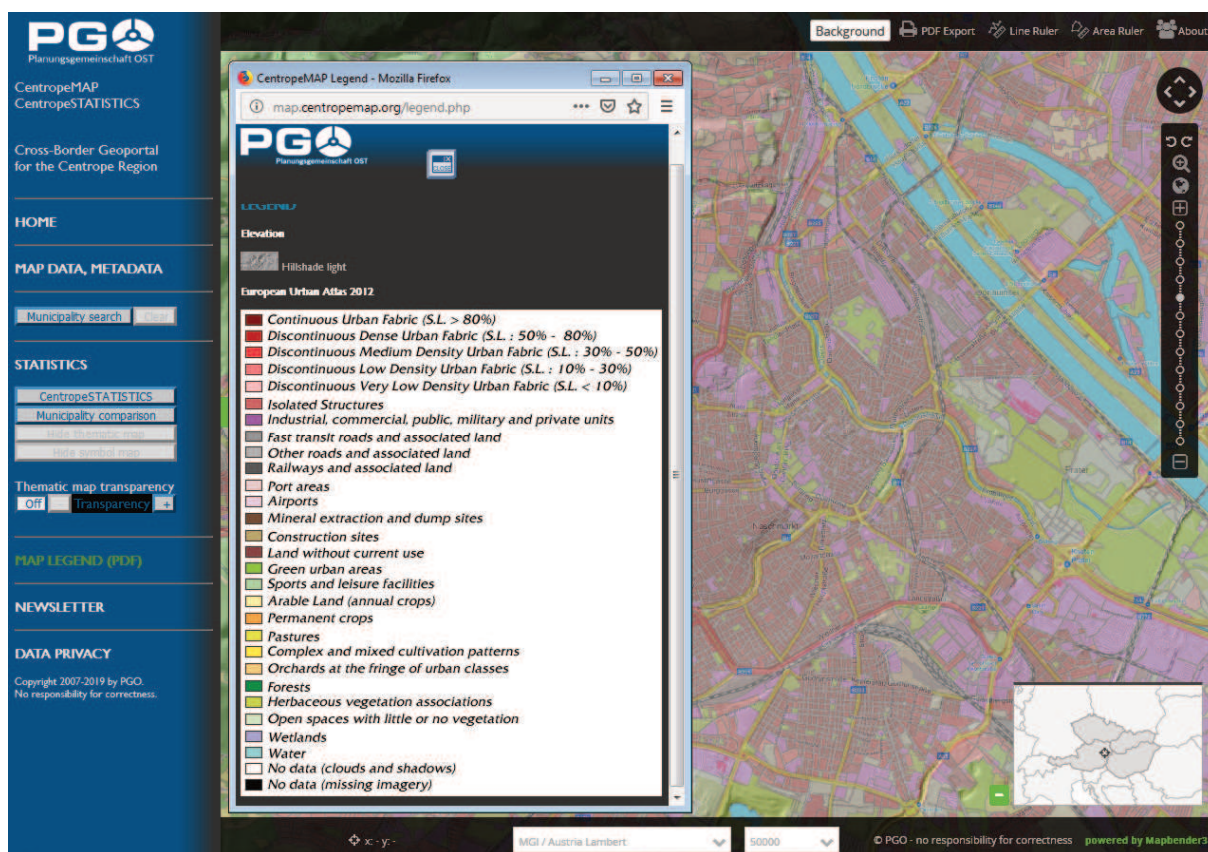


Fig. 1: The geoportal CentropoMAP.

## 2 BACKGROUND

### 2.1 Genesis of Centrope and CentropoMAP

The Centrope region is an artificial region consisting of the counties/federal states Burgenland, Lower Austria, Vienna; Jihočeský kraj, Jihomoravský kraj, Győr-Moson-Sopron, Bratislavský kraj, and Trnavský kraj.<sup>1</sup> It was founded in the year 2003 by politicians and economic actors from the four countries Austria,

<sup>1</sup> The Centrope region as seen by CentropoMAP and CentropoSTATISTICS also features data from Vysočina kraj (Czech Republic) and Vas county (Hungary).

Czech Republic, Hungary, and Slovak Republic to compensate the social and economic disadvantages which were laid on this region during the decades of the Iron Curtain. At that time the Planning Association East (PGO – Planungsgemeinschaft Ost)<sup>2</sup> launched the pilot project “Base Map Centrope” which aimed at the collection of geodata throughout the Centrope region.

During almost 15 years of run-time an excellent communication and exchange basis between all partners (geodata and statistics experts) could be established, mainly because of the regular annual workshops where latest developments are discussed, new ideas are exchanged and datasets are harmonised. CentropeMAP is a web-based application which does not need any software installation, but can be run from any standard computer with internet connection.

### 3 WHAT MAKES CENTROPEMAP UNIQUE?

#### 3.1 Combination of geodata from four countries

CentropeMAP concentrates on datasets which are important for spatial planning and related disciplines like

- basic spatial information like boundaries, biota, water courses/water bodies, transport infrastructure, land use etc.,
- statistical data on demography, migration, education, economy/job market etc.,
- time series of data to analyse the development of the region.

CentropeMAP obtains its geodata directly from the data keeping authorities, which are mainly the GIS departments of the Austrian federal states Burgenland, Lower Austria, and Vienna, the Austrian agroforestry computing centre LFRZ, geoland.at, ITS Vienna Region, the European Environment agency, the Czech counties Jihomoravský and Vysočina, the Czech environment agency CENIA, and the Slovak environment agency SAZP.

#### 3.2 Harmonised municipality data across the borders

Harmonisation of geodata across Europe is currently ongoing within the INSPIRE directive.<sup>3</sup> However, this process turned out to have rather slow progress during the past years so that there are currently no results which can be used in CentropeMAP. We are nevertheless keeping an eye on the INSPIRE implementation in the Centrope countries and are technically ready to use the results in our geoportal.

As far as statistics are concerned, data harmonisation on municipality level is a challenging process. Data from the partner regions may only be merged into a common table if data survey and data processing were done in the same way in all countries. This is quite simple when talking about demographic data; but as soon as other areas like unemployment or household size are reached, problems arise because terms like “unemployed” or “household” are differently defined in the partner countries. Also the methods of data survey are sometimes different – for example, the number of unemployed people is counted by due date in one country, but by monthly annual averages in other countries. In some cases it is possible to eliminate such differences by data aggregation, but this may lead to datasets with weak explanatory power.

Also, when talking about data on municipal level, data protection guidelines become an important issue. Combining attributes in small municipalities allows conclusions regarding single persons, therefore such datasets are not available throughout all partner countries. Nevertheless, CentropeSTATISTICS concentrates on municipality data because only this level allows detailed analyses on a small-scale regional level. Smaller levels like registration districts or even more detailed statistical units are not suitable for comparison because their definition is too different in each of the partner countries, and numbers from such small units are far too exact to meet requirements of data protection – statistical inference to single persons must not happen with published datasets.

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<sup>2</sup> PGO is a common association of the Austrian federal states Burgenland, Lower Austria, and Vienna dealing with calibration, coordination, and preparation of spatial planning relevant issues in Eastern Austria.

<sup>3</sup> INSPIRE: Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community.

### 3.3 Easy map and chart creation

Centropemap and CentropemapSTATISTICS have become a very extensive and complex information system. Nevertheless, we take care that map and chart creation remain a simple, user-friendly designed process which can be done step by step, comprehensible and well-documented. Every statistical process starts with the selection of the topic (table). Each table offers some possibilities to create maps or charts from certain table columns; it is also possible to combine values from more than one table in a user-defined table. CentropemapSTATISTICS users should bring along some basic knowledge in mapping and cartography to make sure they produce meaningful output. An extensive manual in English and German helps understand how CentropemapSTATISTICS works.

On the Centropemap website we also prepared some examples of map and chart creation to illustrate that it is an easy process to turn statistical figures into colourful maps and different types of charts for one or more municipalities or regions. With “Centropemap in Figures” (see following chapter) a load of additional maps in print-ready layout is going to be released during the year 2019.

### 3.4 To be published soon: Digital Atlas “Centropemap in Figures”

There are plenty of brochures in printed and online versions from various national or regional statistical offices. They all display their related region in figures, graphs, charts, and maps, but usually their extent ends at the region or country boundaries. The Centropemap team developed a series of predefined, layouted, print-ready thematic maps of the Centropemap region with these topics:

- The Centropemap region at a glance
- Population development (10-year interval)
- Population density (inhabitants per square kilometre)
- Population aged younger than 15 years
- Change of population aged younger than 15 years (10-year interval)
- Super-aged<sup>4</sup> Centropemap? Percentage of population aged 65 and more
- Ageing of Centropemap’s population (Change of population aged 65+, 10-year interval)
- Old age dependency ratio
- Economic dependency ratio
- Working age population
- Change of working age population (10-year interval)
- Unemployment rate
- Inbound commuting
- Outward-bound commuting

These maps (see figure 2) will be available for download soon through our website [www.centropemap.org](http://www.centropemap.org) as PDF. All tables, charts, and maps are updated annually, the previous files will be archived (also accessible for download).

## 4 WEB LINK

<http://www.centropemap.org/>

<http://map.centropemap.org/>

<sup>4</sup> A super-aged population is defined as having more than 21 % people aged 65 and older. (Definition of ISO – International Organization for Standardization, see <https://www.iso.org/news/Ref2170.htm>)

# The Centrope region at a glance

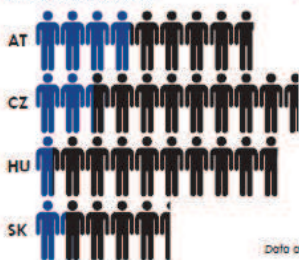
Centropemap/STATISTICS is a cross-border information system and free geoportals of the Austrian Planning Association East (PGO) which gives planners and decision makers a better overview of the Centrope region. The Centrope region consists of adjacent counties and states along the borders between Austria, the Czech Republic, Hungary, and the Slovak Republic. This publication aims to present selected data from Centropestatistics to show the development of this cross-border region in the last 10-15 years. More info and data can be found at our website [www.centropemap.org](http://www.centropemap.org).

The location of the CENTROPE region, at the intersection of four countries, is unique in Europe. The two EU capital cities of Bratislava and Vienna, whose agglomerations are separated by a mere 50 kilometres, the cities of Brno and Győr, as regionally significant urban centres, as well as numerous other eminent and attractive cities, are the powerhouses of an economically and culturally expanding European region.

Population in Centrope member countries 2018

Black: total population

Blue: Population in Centrope

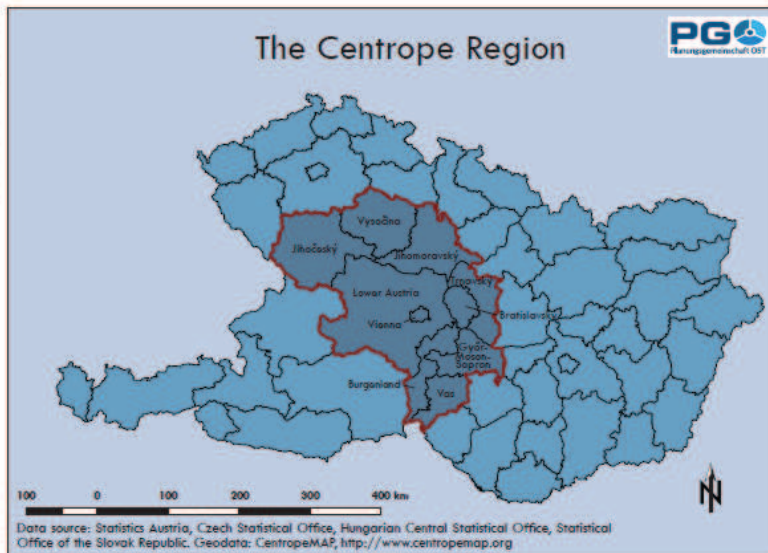


Date as of 01.01.2018

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| Country         | Area (km <sup>2</sup> ) | Inhabitants 2018 | Centrope parts of the country                      | Municipalities | Area in Centrope region (km <sup>2</sup> ) | Area in Centrope region (%) | Inhabitants in Centrope (absolute) | Inhabitants in Centrope (%) |
|-----------------|-------------------------|------------------|--|----------------|--|-----------------------------|------------------------------------|-----------------------------|
| Austria         | 83 880                  | 8 822 267        | 3 federal states Vienna, Lower Austria, Burgenland | 767            | 23 562                                     | 38                          | 3 852 119                          | 47                          |
| Czech Republic  | 79 000                  | 10 610 055       | 3 regions South Bohemia, South Moravia, Vysočina   | 2 001          | 24 099                                     | 39                          | 2 332 319                          | 29                          |
| Hungary         | 92 990                  | 9 776 371        | 2 counties Győr-Ménfőcsanak, Vas                   | 399            | 7 713                                      | 13                          | 714 823                            | 9                           |
| Slovak Republic | 49 033                  | 5 443 120        | 2 regions Bratislava, Trnava                       | 340            | 6 216                                      | 10                          | 1 218 210                          | 18                          |
| Centrope*       |                         |                  | 10 subregions of 4 countries                       | 3 507          | 61 590                                     | 100                         | 8 112 471                          | 100                         |

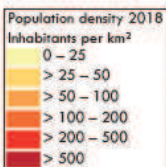
\* Centrope as seen by Centropemap and Centropestatistics



Data source: Statistics Austria, Czech Statistical Office, Hungarian Central Statistical Office, Statistical Office of the Slovak Republic, Geodata: Centropemap, <http://www.centropemap.org>

The highest population density values of the Centrope region (calculated as inhabitants per square kilometre) can be seen in and around the greater agglomeration areas (Vienna and southern surroundings, Bratislava, Brno and Győr regions).

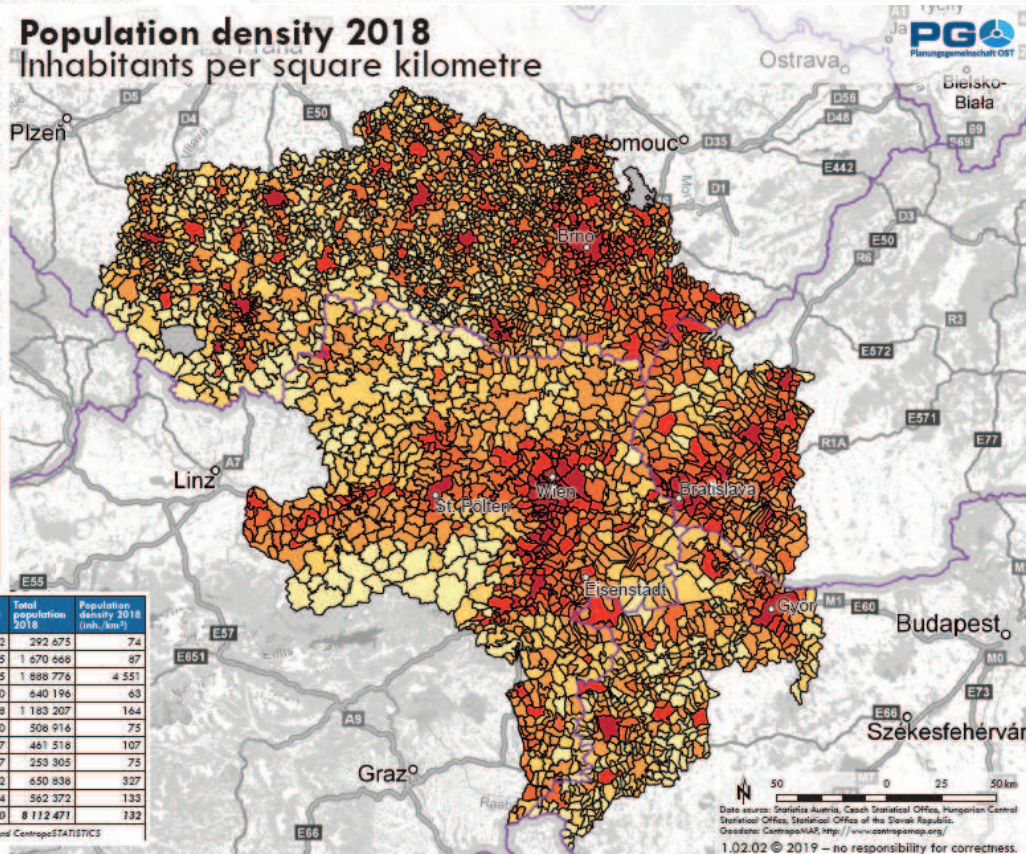
Especially at the boundaries between Lower Austria and the Czech Republic a lower population density can be observed, most probably due to late effects of the Iron Curtain, whereas there are almost no effects of the 1992 established border between the Czech and Slovak Republics are visible in terms of population density.



| County           | Area (km <sup>2</sup> ) | Total population 2018 | Population density 2018 (inh./km <sup>2</sup> ) |
|------------------|-------------------------|-----------------------|---|
| Burgenland       | 3 962                   | 292 675               | 74  |
| Lower Austria    | 19 185                  | 1 670 666             | 87  |
| Vienna           | 415                     | 1 888 776             | 4 551   |
| Jihocesky        | 10 100                  | 640 196               | 63  |
| Jihomoravsky     | 7 228                   | 1 183 207             | 164   |
| Vysočina         | 6 800                   | 508 914               | 75  |
| Győr-Ménfőcsanak | 4 317                   | 461 518               | 107   |
| Vas              | 3 397                   | 253 305               | 75  |
| Bratislavsky     | 1 992                   | 650 838               | 327   |
| Trnavsky         | 4 224                   | 562 372               | 133   |
| Centrope*        | 61 620                  | 8 112 471             | 132   |

\* Centrope as seen by Centropemap and Centropestatistics

## Population density 2018 Inhabitants per square kilometre



Date source: Statistics Austria, Czech Statistical Office, Hungarian Central Statistical Office, Statistical Office of the Slovak Republic, Geodata: Centropemap, <http://www.centropemap.org/>

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Fig. 2: Example maps from “Centrope in Figures” series.