

# CentropeMAP – Cross-Border Geoportal with Interactive Cross-Border Statistics Database

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## 1 ABSTRACT

Centrope combines several adjacent regions from the neighbouring countries Austria, Czech Republic, Hungary, and Slovakia. CentropeMAP is a cross-border geoportal which brings together geodatasets from all four countries in a single map viewing application. The layer themes are selected in a way that they are of interest for regional planners and similar professions. CentropeSTATISTICS is a cross-border statistics database directly connected to CentropeMAP. It allows interactive creation of user-defined maps, which are visualised in the CentropeMAP geoportal, and charts which are delivered as graphic files for further use in any other application. To ensure that CentropeMAP and CentropeSTATISTICS are a well-known tool among planning and statistics experts, multi-language newsletters are released twice a year. In the second half of 2015, there will be a complete relaunch of CentropeMAP and CentropeSTATISTICS including a new geoportal software, a visual refreshment of CentropeSTATISTICS, a new user manual and online tool tips for easier use.

## 2 OVERVIEW

The Centrope region consists of a number of adjacent counties and states along the borders between Austria, the Czech Republic, Hungary, and the Slovak Republic, comprising regions Vysocina, Jihomoravsky, Bratislavsky, Trnavsky, Győr-Moson-Sopron, Burgenland, Lower Austria, and Vienna. It was founded 2003 by a political declaration and aims to strengthen partnership and economy in a region which suffered from the Iron Curtain during the second half of the 20th century.

CentropeMAP is a geoportal connecting the region by collecting web map services from the partner countries. The services are brought together in a single map viewer and allow the user to experience a cross-border working area with dozens of data layers dealing with all topics which could be of interest for regional planners and similar professions. Layers are coming from the fields of biota, boundaries, elevation, imagery/base maps, inland waters, planning/cadastre, structure, and transportation.

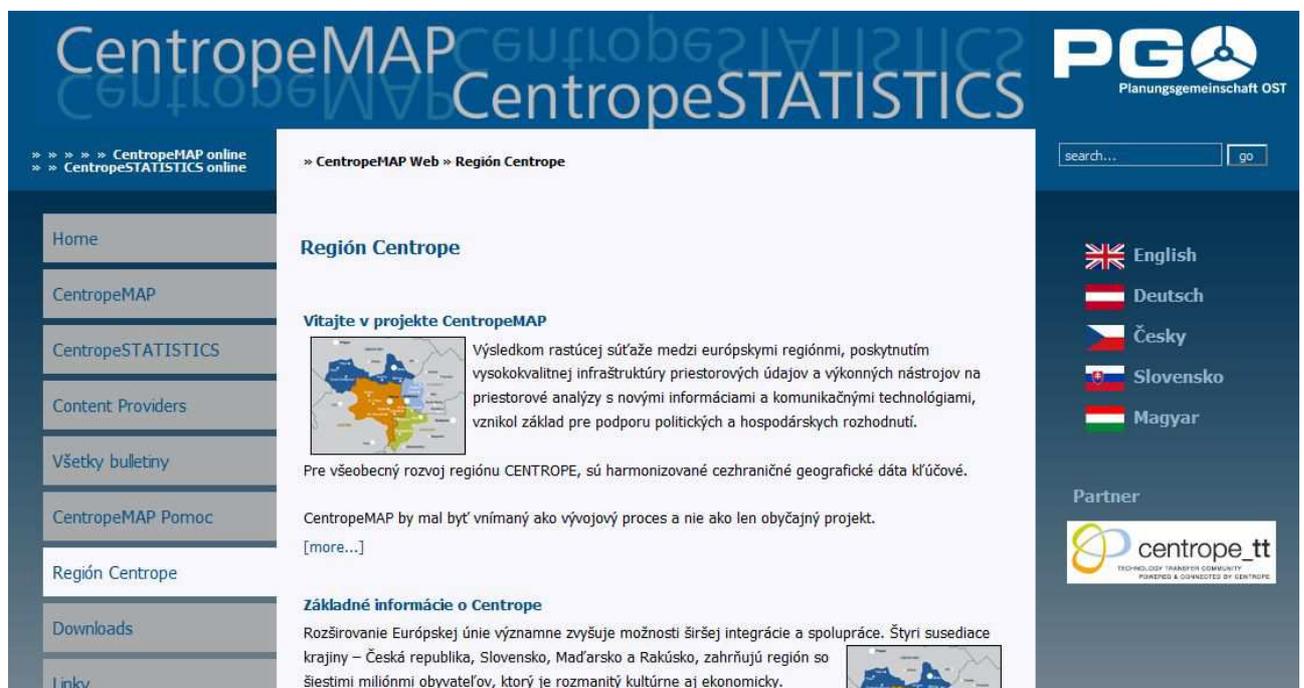


Fig. 1: Multi-language CentropeMAP website (Slovak version).

Initially, the CentropeMAP project started 2004 with postal exchange of CD-ROMs containing shapefiles for use with standard desktop GIS applications. Only two years later, there were already web map servers in all partner countries so that we could start to set up an internet geoportal. In addition, a website in five

languages was created (Czech, English, German, Hungarian, Slovak) to make sure that the main contents are accessible for anyone in the four countries without a language barrier. However, the standard language of the geoportal itself remains English because here changes happen more often than on the website and there is no budget for continuous and simultaneous translation between all five languages.

Soon after CentropeMAP had been established, the idea came up to integrate statistics layers into the geoportal. First, only static layers were integrated, but soon the idea came up to allow the user to influence the statistic data display mode. Furthermore, the statisticians welcomed the possibility to put together data from four countries in single tables and gave permission to publish not only the map output, but also the numbers behind these graphics. The CentropeSTATISTICS cross-border database was born in the year 2009 and is steadily growing since then. Annual workshops bring together delegations from the statistical offices of Burgenland, Lower Austria, Vienna, the Czech Republic, Hungary, and the Slovak Republic to discuss the further extension of the cross-border statistics database.

### 3 WHAT MAKES CENTROPESTATISTICS A UNIQUE SERVICE

#### 3.1 General

CentropeSTATISTICS is not the only cross-border statistics database in the world wide web; but at least as far as the involved partner countries are concerned, it is the only available free web tool to visualise cross-border statistical data in its own connected geoportal allowing the user to influence the way of visualisation in multiple ways. CentropeSTATISTICS can not only create maps, it also serves charts which are interactively created from the data in the cross-border database.

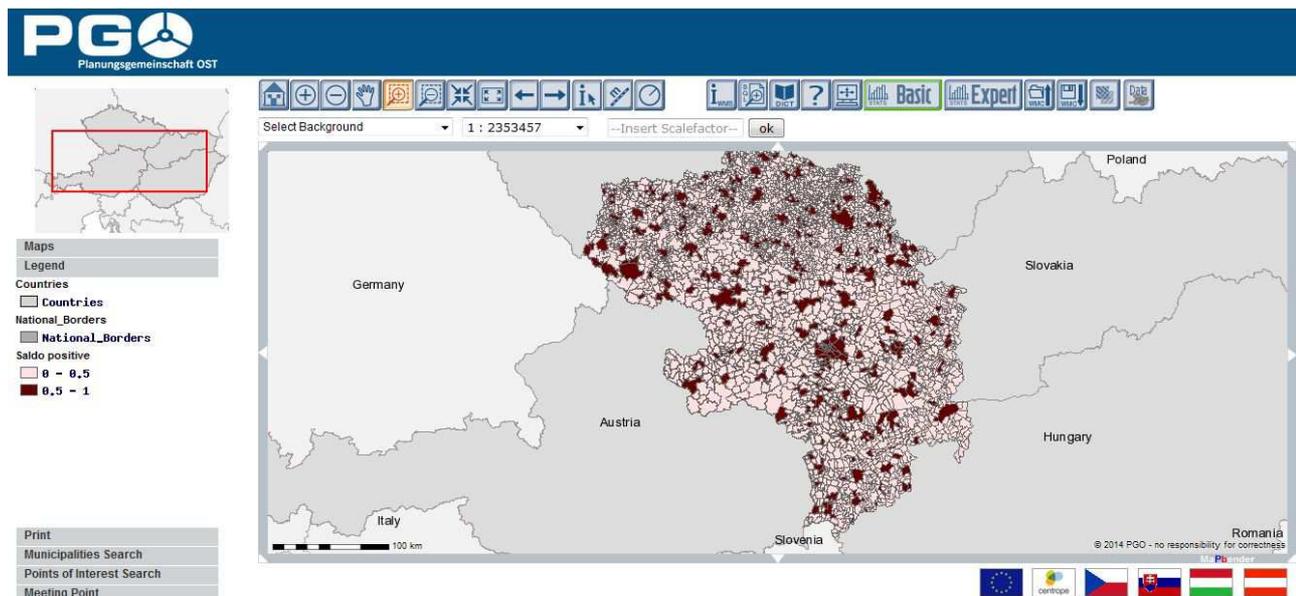


Fig. 2: Example of an interactively created choropleth map from census 2011 data showing the commuter saldo per municipality. Municipalities shown in dark red colour have more commuters in than out.

There are two main emphases of data collection: population data and census data. Almost all population datasets in the cross-border statistical database are collected in a time series so that the development of the region can be explored in yearly steps since 2001; the data range comprises various fields like population statistics, population development and projection as well as land use, educational statistics or migration. The census datasets concentrate on the recent 2011 census and go back to previous census dates until 1970/71, calculated according to today’s municipality boundaries so that all data can be compared with each other.

CentropeSTATISTICS provides almost all data on municipality level. An automatic aggregation to NUTS 3 level is also available. CentropeSTATISTICS features two working modes:

(1) The Basic Mode provides pre-defined maps and charts. It serves mainly to gain a quick overview about the most important data about the region and helps people who do not have sufficient experience in working with statistical data. There are no options which can be user-defined (except selection of municipalities for chart creation).

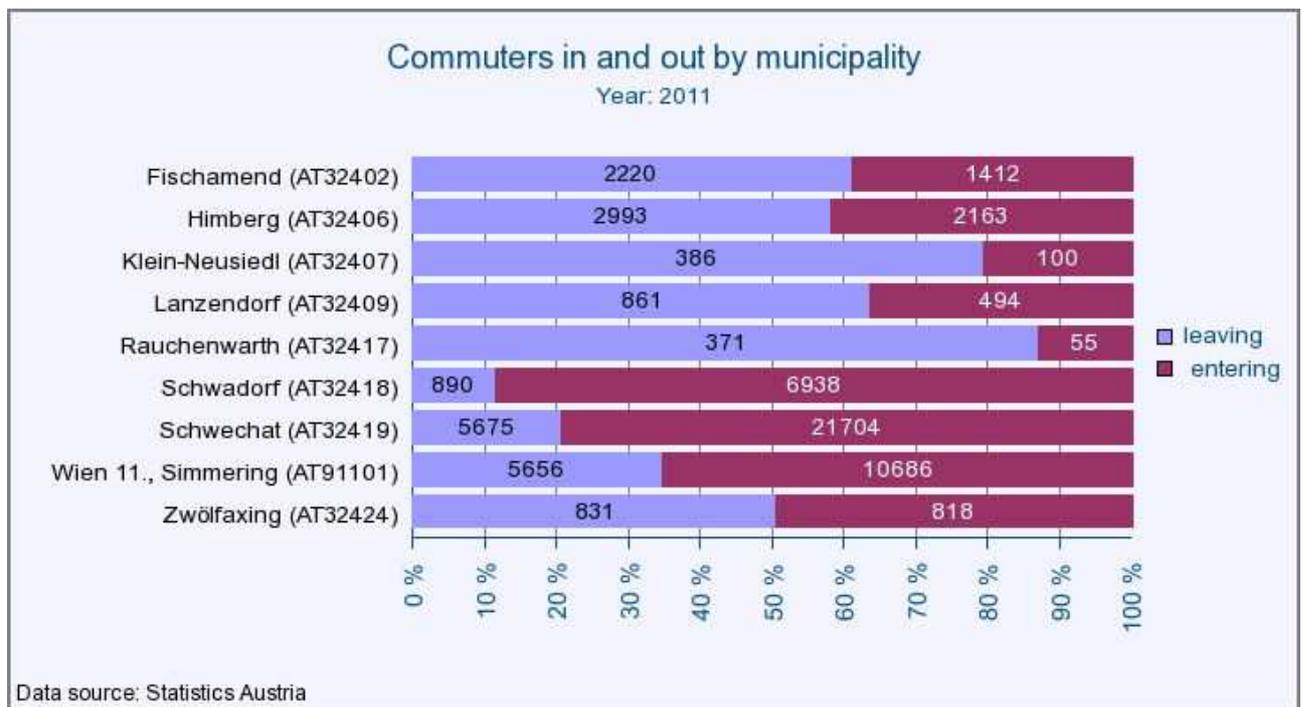


Fig. 3: Example of an interactively created horizontal bar chart from census 2011 data showing the number of commuters leaving and entering municipalities around Schwechat (hometown of Vienna international airport).

(2) The Expert Mode gives direct access to the cross-border statistics database and opens the full range of interactive map and chart creation. It requires some knowledge in statistics, mapping and/or cartography because an unexperienced user could run into danger to create nonsense maps. The expert mode allow creation of standard choroplethic maps, symbol maps and various types of charts like bar charts, point and/or line charts and pie charts. There is the possibility to create own tables from one or more tables from the cross-border database and/or personal data uploads. With this function, personal data can be used with the CentropeSTATISTICS map and chart interface. When the CentropeMAP and CentropeSTATISTICS relaunch is released in the second half of 2015, a new menu structure will be implemented to the expert mode to clearly distinguish between annual (time series) data and census data.

### 3.2 Technical details

The main technique behind CentropeSTATISTICS is Styled Layer Descriptor (SLD): The user-defined maps are created through SLD only. The layer containing the geodata for the statistical map has a pre-defined transparent layout so that it is invisible without any attached SLD document (which is the default value when starting CentropeSTATISTICS). As soon as the user creates their own map layer from statistic data, their selections are converted into a SLD document on the CentropeMAP server. The mapview is refreshed then, containing the SLD URL as part of the GetMap request of the statistics layer. Also a timestamp is added to this request. These timestamp characters are ignored by the mapserver, but Mapbender only reloads a layer when the request string has changed, so the timestamp ensures that every GetMap request is different from the one before, causing the client to load the new map on refresh.

## 4 THE CENTROPEMAP NEWSLETTER

The CentropeMAP newsletter is published twice a year and aims to inform members of state administration and statistical offices about the capabilities of CentropeMAP and CentropeSTATISTICS as well as news from the statistical offices of the partner countries. It also distributes information regarding geodata in the CentropeMAP geoportal. The contents of the newsletter are delivered by all partner countries: Each partner hands in their articles which are then brought together in a commonly layouted PDF document. The PDF is then put online at the CentropeMAP website and the information is spread via internal mailing lists of each partner involved.

**Centropemap STATISTICS**

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**Centropemap STATISTICS**  
www.centropemap.org



Alle Daten, Karten und Abbildungen sind entweder Teil des Geoportals www.centropemap.org oder werden abgeleitet mit Erlaubnis der Statistiker der Teilnehmer der Teilnehmerstaaten, der Slowakei und Ungarns sowie Bulgariens, Nordmazedonien und Wien. Die Weiterverbreitung dieses Newsletters wird ausdrücklich empfohlen!

## Volkszählungsdaten 2011

Die Datenlieferung seitens aller Centropemap STATISTICS-Partner (Ungarn, Tschechische Republik, Slowakische Republik, Burgenland, Niederösterreich Wien) ist abgeschlossen. Viele Volkszählungsdaten sind bereits über den Expertenmodus von Centropemap STATISTICS öffentlich verfügbar.

Seit November 2014 gibt es in Centropemap STATISTICS Zugriff auf diese acht Themen in der Vollständigkeit von:

- Familienstand:** Diese Tabelle zeigt die Bevölkerung in ledig, verheiratet, geschieden und verwitwet.
- Bildung:** Hier werden die Bevölkerung jeder Gemeinde nach ihrem jeweiligen Bildungsniveau in den ISCED-Klassen (International Standard Classification of Education) 1 bis 5 dargestellt.
- Bevölkerung nach wirtschaftlicher Aktivität:** Diese Tabelle zeigt, wie viele Personen beschäftigt, arbeitslos oder wirtschaftlich nicht aktiv sind.
- Bevölkerung nach Erwerbstätigkeit:** Absolutzahl und Anteil der Arbeitnehmern, Arbeitgeber, Selbstständigen und nicht aktiven Familienangehörigen.
- Ein- und Auspendler:** Diese Tabelle zeigt, wie viele Personen in jeder Gemeinde zum Zweck der Arbeit ein- oder emigrieren.
- Gebäude nach Baujahr:** Diese Tabelle bildet das Gebäudealter je Gemeinde nach dem Jahr der Konstruktion ab (ab 1951).
- Bevölkerung nach Staatsbürgerschaft:** Der Fokus liegt auf der Centropemap-Region, daher sind die Kategorien AT, CZ, HU, SK, EU und Sonstige.
- Alle Daten dieser Volkszählungstabellen können heruntergeladen werden und stehen auch für die Erstellung der statistischen Karten und verschiedener Diagramme in Centropemap STATISTICS zur Verfügung (siehe Seite 3).**

**Updated tables November 2014**

Updated tables November 2014

Education of population by municipality

Population by economic activity and year

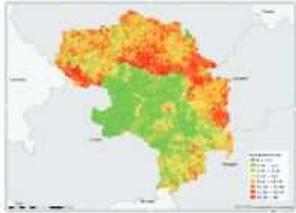
Breakdown of economically active population by type of activity

Economically active persons by NACE sector of activity

Commuters in and out of municipality

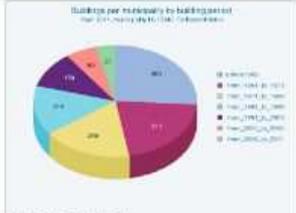
Buildings per municipality by building period

Population by citizenship (AT, CZ, HU, SK, EU, other)



Karte: Arbeitslose 2011 als Anteil an der Summe der Beschäftigten und Arbeitslosen (Summe entspricht der wissenschaftlich definierten Bevölkerung)

Diagramm: Gebäudealter in Ferndauerntal, Ungarn.



Baujahr per municipality by building period  
Legend: 1951-1959, 1960-1969, 1970-1979, 1980-1989, 1990-1999, 2000-2009, 2010-2011

## Open Governmental Data in Österreich

**Über basemap.at**

basemap.at ist das Ergebnis einer Kooperation zwischen dem neuen österreichischen Bundesrat (oder „geobase.at“), ITSV in der Region (Bestandteil von GHP, an der TU Wien und Synergie). Das Projekt ist finanziert durch den Klimaa- und Energiefonds innerhalb eines Förderprogramms für Innovation bei Umweltfreundlicher und effizienter Mobilität.

In dem Jahr 2014 sind 2014 werden die Webseiten für eine offene Webanwendung erstellt; 2014 werden sie für die Allgemeinheit geöffnet und werden weiter für vollständige administrative Aufgaben verwendet. Zusätzlich ist es für private und kommerzielle Zwecke im Rahmen der österreichischen Open-Government-Data-Erklärung verwirklicht.

**Grundlegendes**

basemap.at basiert auf den Verwaltungsdaten der Bundesländer und ihrer Partner, darunter der Statistik und GHP, ein österreichischer Verkehrsgeograph.

Die Karte deckt ganz Österreich ab und wird alle zwei Monate von den Partnern aktualisiert. Auch die Kartographie wird ständig aktualisiert und verbessert. Dabei können sich auch nur die Inhalte, sondern auch die Anzeigen in Zukunft ändern.

**Zugang zum Kartendienst**

basemap.at bietet vorgefertigte Karten in der Projektion EPSG:31457 (Web-Mercator Auxiliary Sphere) und ist mit anderen Produkten wie Open Street Map, Google Maps oder Bing Maps kompatibel.

Der Dienst stellt als OGC-konformer OpenGIS Web Map Tile Service 1.0.0 (OWMTS) zur Verfügung.

**Schnittstellen**

<http://www.basemap.at/wmts/1.0.0/WMTSCapabilities.xml>

<http://www.basemap.at/wmts/1.0.0/WMTSCapabilities-arrange.xml> (specially for ArcGIS 10.1)

**Metadaten**

Die Metadaten für basemap.at sind über die österreichische OGD-Plattform erhältlich: <http://www.wdata.gv.at>



Fig. 4 : Centropemap and Centropemap STATISTICS newsletter (German edition, December 2014). Original is available for download at <http://www.centropemap.org>

The Centropemap and Centropemap STATISTICS newsletter is currently available in three languages (Czech, English, German). A Hungarian version is in the state of preparation.

## 5 PERSPECTIVES

The Centropemap geoportal is powered by Mapbender software, a content management system for mapping applications and geodata services. Currently, Mapbender is developing a totally new software bundle called Mapbender 3 which is faster and more powerful than its parent Mapbender 2, which we have currently in use. Progress in technology makes it necessary to have a major software update done this year, so there will be a migration from Mapbender 2 to Mapbender 3 including a graphical relaunch of both Centropemap and Centropemap STATISTICS. Also, we will clean up the content: Some changes in the past were added with little coordination so that now there are a few confusing areas in the interactive statistics client. These will be fixed together with the release of an all new manual for Centropemap STATISTICS. Tool tips will be added to allow for context based online help.

## 6 WEB LINK

Centropemap Website <http://www.centropemap.org>  
 Centropemap and Centropemap STATISTICS Geoportal: <http://map.centropemap.org>

