

ANNEX 70 – CASE STUDY FOR EnCO2Web
NOV 06, 2019

- **Title of case study:** EnCO2Web – Austrian-wide modelling and web-based visualization of energy consumption and greenhouse gas emissions on local level
 - Similar to Energy Atlas (USA)
- **Geography:** The study was implemented on municipal level throughout Austria.
- **Scale / population:** The scale of the study is throughout Austria with a population of approximately 8.8 million people.
- **Who was involved:** The project leader is Dr. Lore Abart-Heriszt from the Institute of Spatial Planning, Environmental Planning and Land Rearrangement (IRUB) of the University of Natural Resources and Life Sciences, Vienna. Project partners are the Spatial Services GmbH (SPASE), Salzburg, and the Department of Geoinformatics from the University of Salzburg, Salzburg.

- **Lead description of the case study:** The aim of the study is the development of a geo-based database on municipal level, which provides energy-related structural data, the total energy consumption and greenhouse gas emissions of all Austrian cities and communities considering all kinds of land use and mobility. Data is visualized in a replicable way and in the necessary differentiation. The database provides comprehensive information for decision makers of different disciplines of administration and politics as well as for the general (professional) public.

- **Datasets used:** Data of official statistics was used as well as open governance data. Using specifically developed code, data of different spacial levels was combined and reallocated on the municipal level. Data of mobility was not reallocated but calculated bottom-up. The temporal resolution is limited to data from 2011, the spacial resolution ranges from federal to municipal level.

- **Issues on access to the data:** No real time calculation is possible because of insufficient data availability.

- **Strength / Unique Selling Point:** The database shall serve as a reference for profound assessments of development strategies concerning their impacts on energy, mobility and climate. The visualization of the database, including interactive web-services, shall ensure the broad applicability of the insights and impart complex and spatial relevant facts in a user-friendly and interactive way. The database can contribute to a more efficient propagation of the topics “energy transition” and “climate change” in the public discussion. Insights can be integrated in energy and climate related fields of activity, for example the development of strategies for climate protection, preparation of energy and mobility concepts as well as spatial planning and the development of infrastructure.

- **Motivation / issues:** So far, designing strategies on the scale of municipalities for a better integration of energy and climate policy premises were hampered by the lack of

comprehensive data on the current situation regarding energy consumption and greenhouse gas emissions on local level.

- **Implementation / Method:** A comprehensive survey covering all municipalities of Austria is carried out. The research project uses a comprehensive approach, which considers all kinds of usages (residential use, agriculture and forestry, industry and trade, consulting) as well as the usage of all energy sources. A consequent differentiation of the energy consumption with respect to energy sources and application is provided. The main focus is on modelling of the daily passenger transportation considering each municipality as place of residence, as place of work and education and as place of customer-centered services. The comprehensive survey covering all municipalities ensures, that the total national energy consumption (also the energy consumption on state level) is reflected by the energy budgets on local level.

The online-database “Energiesmosaik Austria” shows the processed energy and climate related data of all Austrian municipalities from the year 2011 as cartographical presentation and in tabular form – Link: <https://spatial-services-gmbh.gitlab.io/EnCO2Web>

As starting point, the map of Austria is shown, illustrating the municipalities with different colors according to their energy demand. By using the mouse cursor, single municipalities can be chosen and detailed energy consumption is displayed. In addition, municipalities can be chosen by using the search box. The details on energy demand comprise the differentiation in mobility, services, industry and commerce, agriculture and forestry as well as living.

Different data sets can be visualized, like structural data, energy demand, greenhouse gas emissions and key indicators by using a drop down menu. The data set of energy consumption allows further categorization in type of sector, type of energy usage and type of energy carrier. For the greenhouse gas emissions, also the timeframe can be modified (today / tomorrow). “Tomorrow” depicts the year 2050 according to possible scenarios, “today” represents the data basis from 2011.

The area “Data” shows data of municipalities in tabular form. Data can be compared, shown in graphs and downloaded. Also, energy flow diagrams can be displayed, which show the connection of sectors, energy usage and energy carrier (fossil or renewable).

- **Benefits:** For the first time, more than one million energy and climate related data on local level throughout Austria are revealed using an integrated approach. Data is provided free of charge. A homogenous data quality for all Austrian municipalities can be provided by the database. The database shall provide information for decision makers of different disciplines of administration and politics as well as the general (professional) public. It can be used as a reference for profound assessments of development strategies concerning their impacts on energy, mobility and climate.

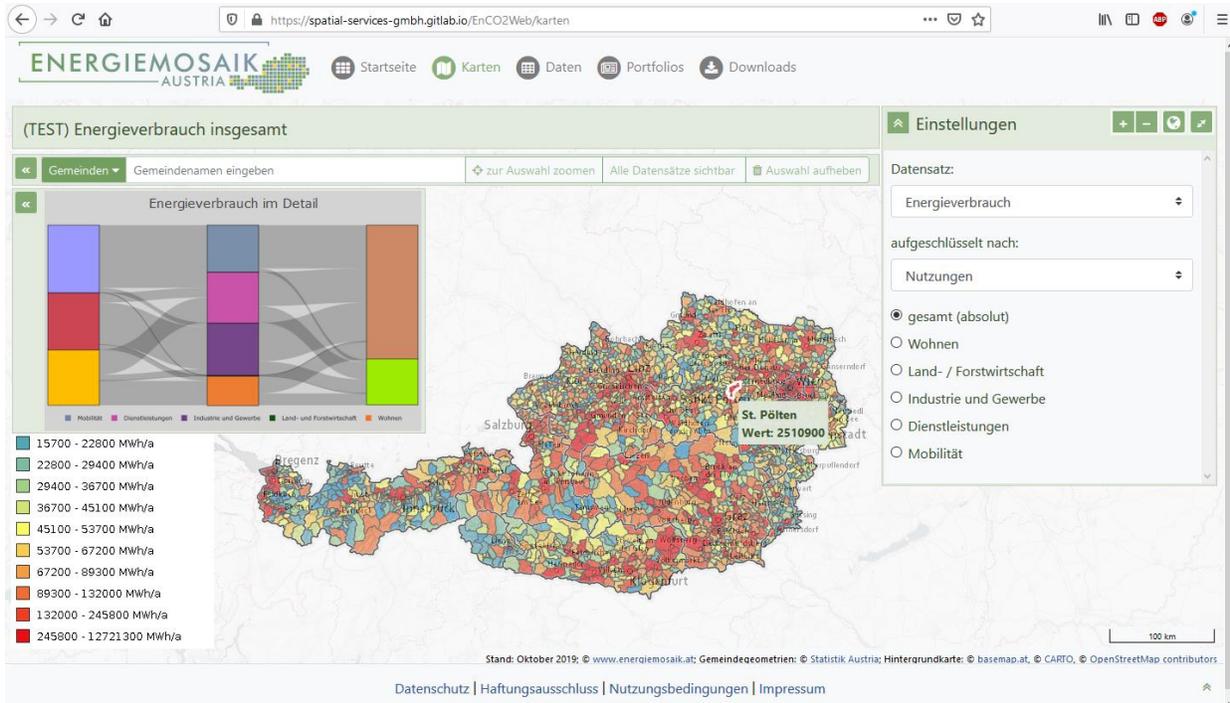


Figure 1: Cartographical overview and energy demand of the municipality St. Pölten shown in detail (Energiemosaik Austria, 2019)

Energieverbrauch in MWh/a

Gemeinden: Gemeinamen eingeben

Gemeinde-code	Gemeinamen	insgesamt	Wohnen	Land- und Forstwirtschaft	Industrie und Gewerbe	Dienstleistungen	Mobilität
10101	Eisenstadt	550.200	115.600	4.000	45.400	211.600	173.600
10201	Rust	51.600	21.800	1.500	3.100	10.000	15.300
10301	Breitenbrunn am Neusiedler See	56.900	21.200	1.100	12.500	4.500	17.700
10302	Donnerskirchen	38.700	18.800	2.000	2.100	4.100	11.700
10303	Großhöflein	41.200	19.100	1.700	2.000	7.900	10.500
10304	Hornstein	97.800	33.900	1.700	33.700	6.200	22.300
10305	Klingenbach	26.000	12.000	800	3.500	2.100	7.500
10306	Leithaprodersdorf	26.200	10.700	2.900	3.600	1.200	7.800
10307	Mörbisch am See	49.600	23.600	1.200	3.700	5.100	16.000
10308	Müllendorf	50.600	12.700	800	11.200	9.000	16.900
10309	Neufeld an der Leitha	114.000	28.800	1.600	53.400	8.200	22.100
10310	Oggau am Neusiedler See	34.900	18.300	1.700	500	2.700	11.800

Einstellungen

Datensatz: Energieverbrauch

aufgeschlüsselt nach: Nutzungen

alle

Wohnen Details

Land- / Forstwirtschaft Details

Industrie und Gewerbe Details

Dienstleistungen Details

Mobilität Details

Figure 2: Tabular overview of energy demands of municipalities (Energiemosaik Austria, 2019)

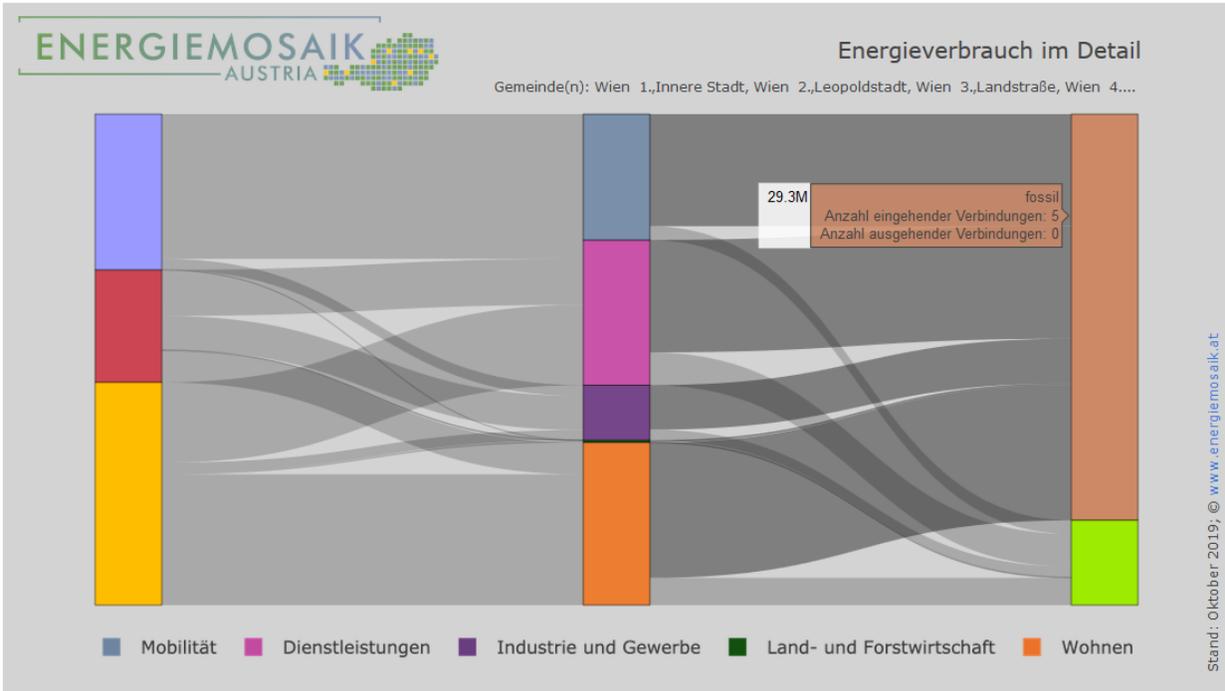


Figure 3: Detailed energy demand of chosen municipalities including energy flows (Energiesmosaik Austria, 2019)