

# Behind the Scenes of Interactive Charts

## Automating the Production of Engaging Web Components

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 [Statistical Days 2022](#) at TU Graz

 [github.com/GregorDeCillia/StatisticalDays2022](https://github.com/GregorDeCillia/StatisticalDays2022)

# Introduction

At **Statistics Austria**, we are currently working towards the release of a **new website** which will launch in **June 2022**.

The new website will make a stronger use of **interactive charts** and **interactive tables (C&Ts)**. This presentation will outline the "**making of**" for these web components.

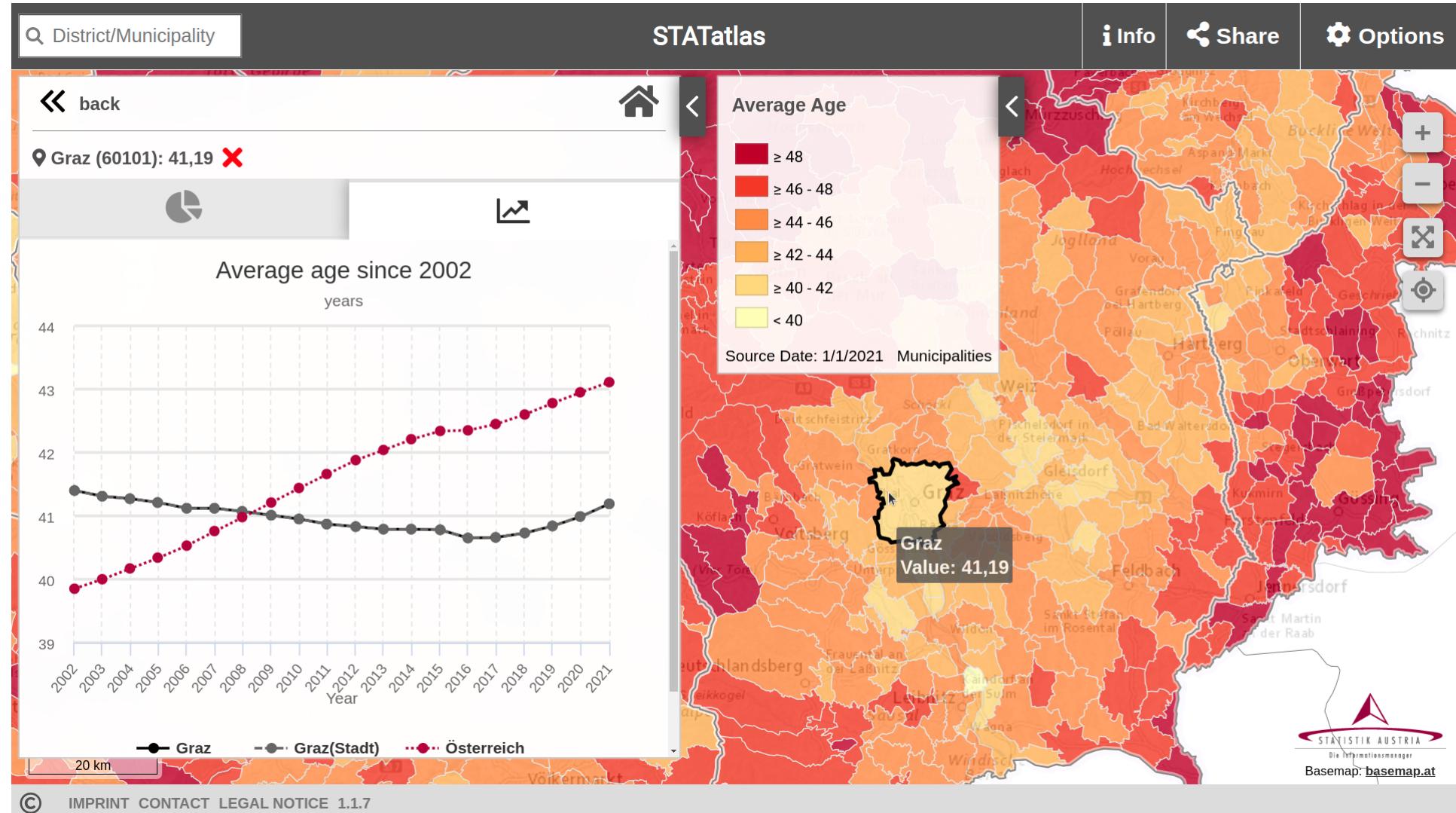
With **C&Ts**, I am referring to web graphics or web tables, which provide interactions like  **tooltips, searching, zooming**, etc.

# We already made our feet wet

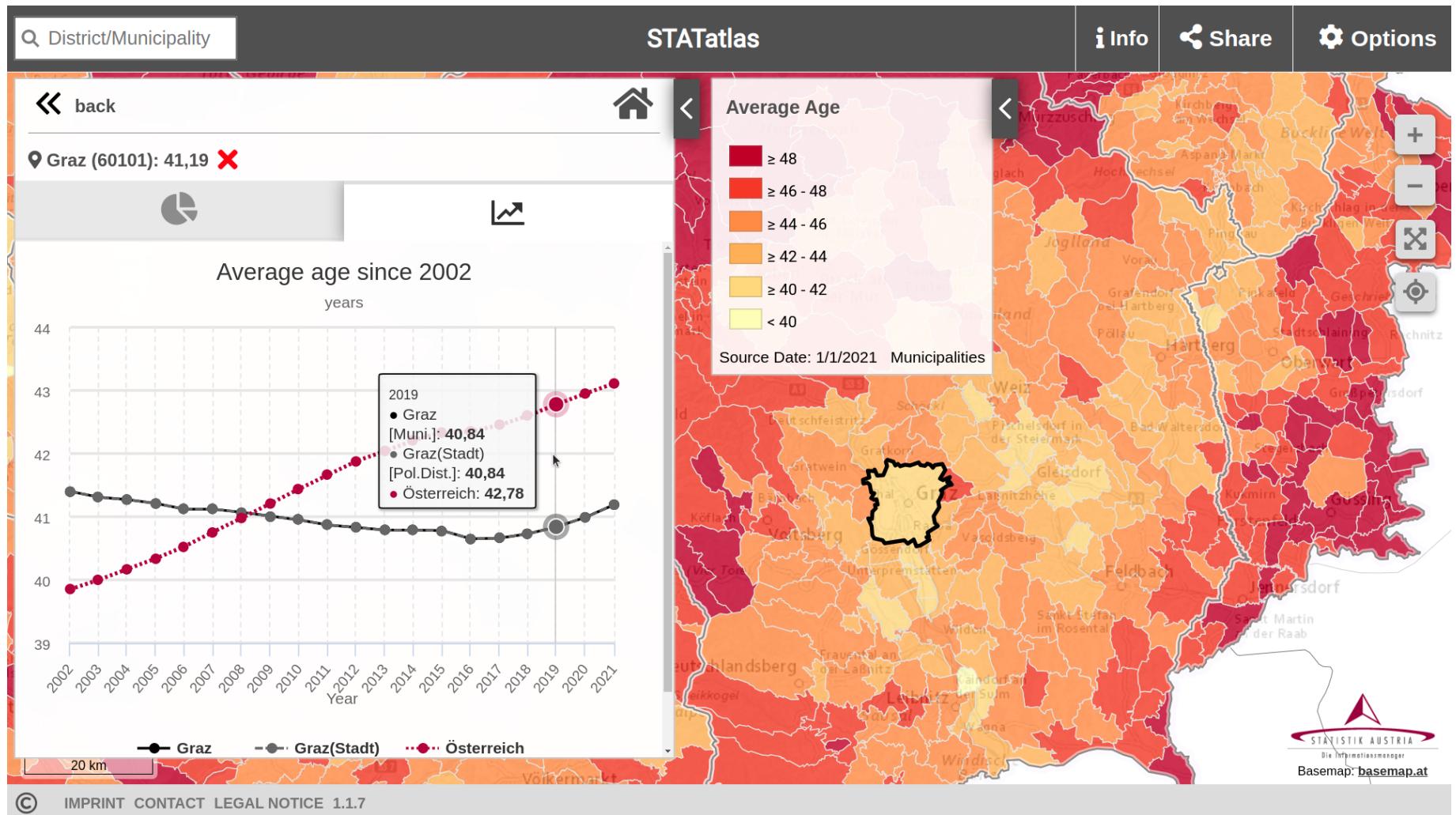
**Statistics Austria** already uses **C&Ts** in some statistical products

- The **STATatlas** provides interactive **maps** on various topics
- The **economic trend monitor** includes interactive **time series** which are updated weekly
- Publications like the **age pyramid** and the **material flows 2019** contain **tailor-made** statistical charts

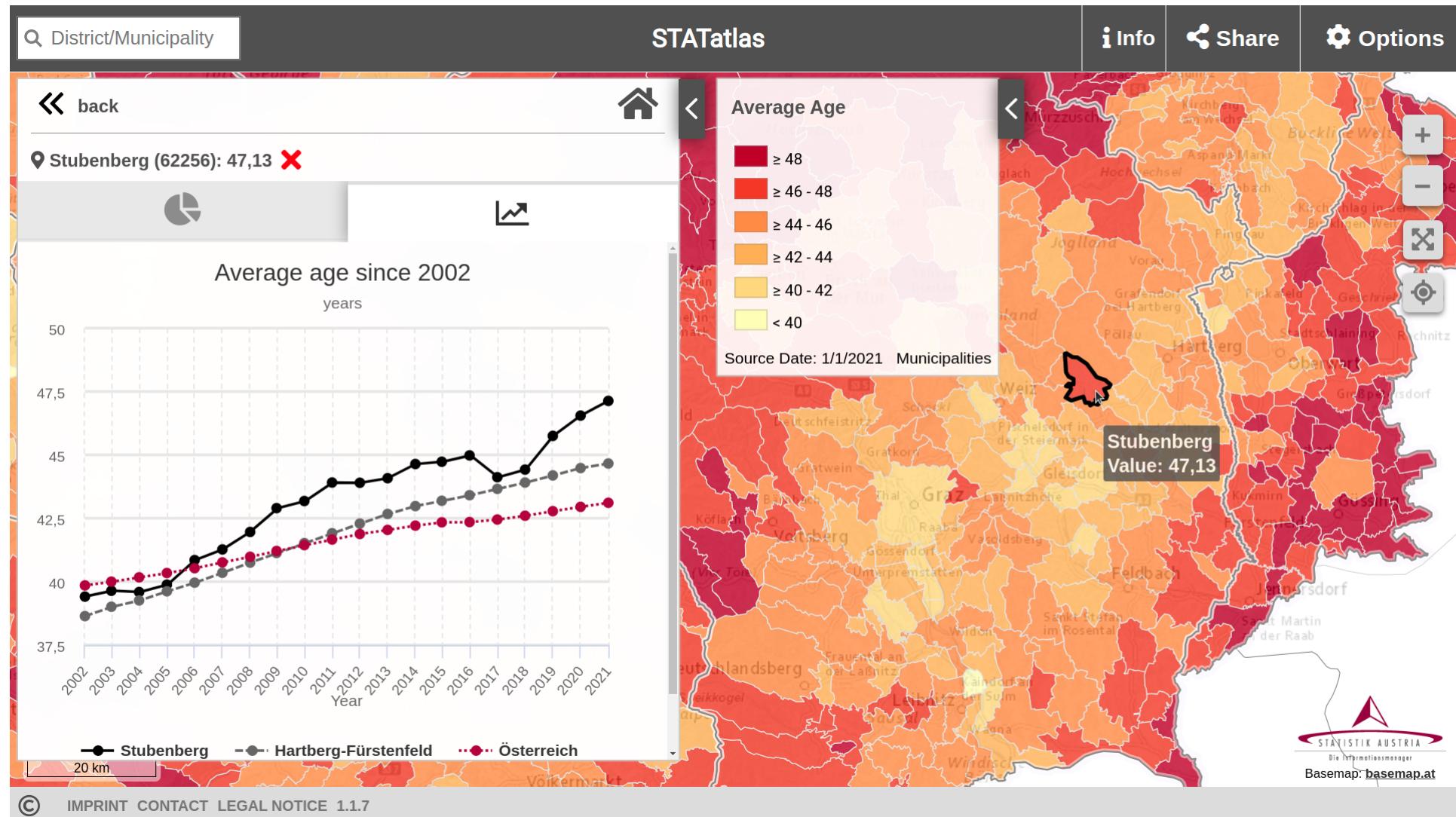
The **STATatlas** provides **maps** (right) and **time series charts** (left) which are both interactive



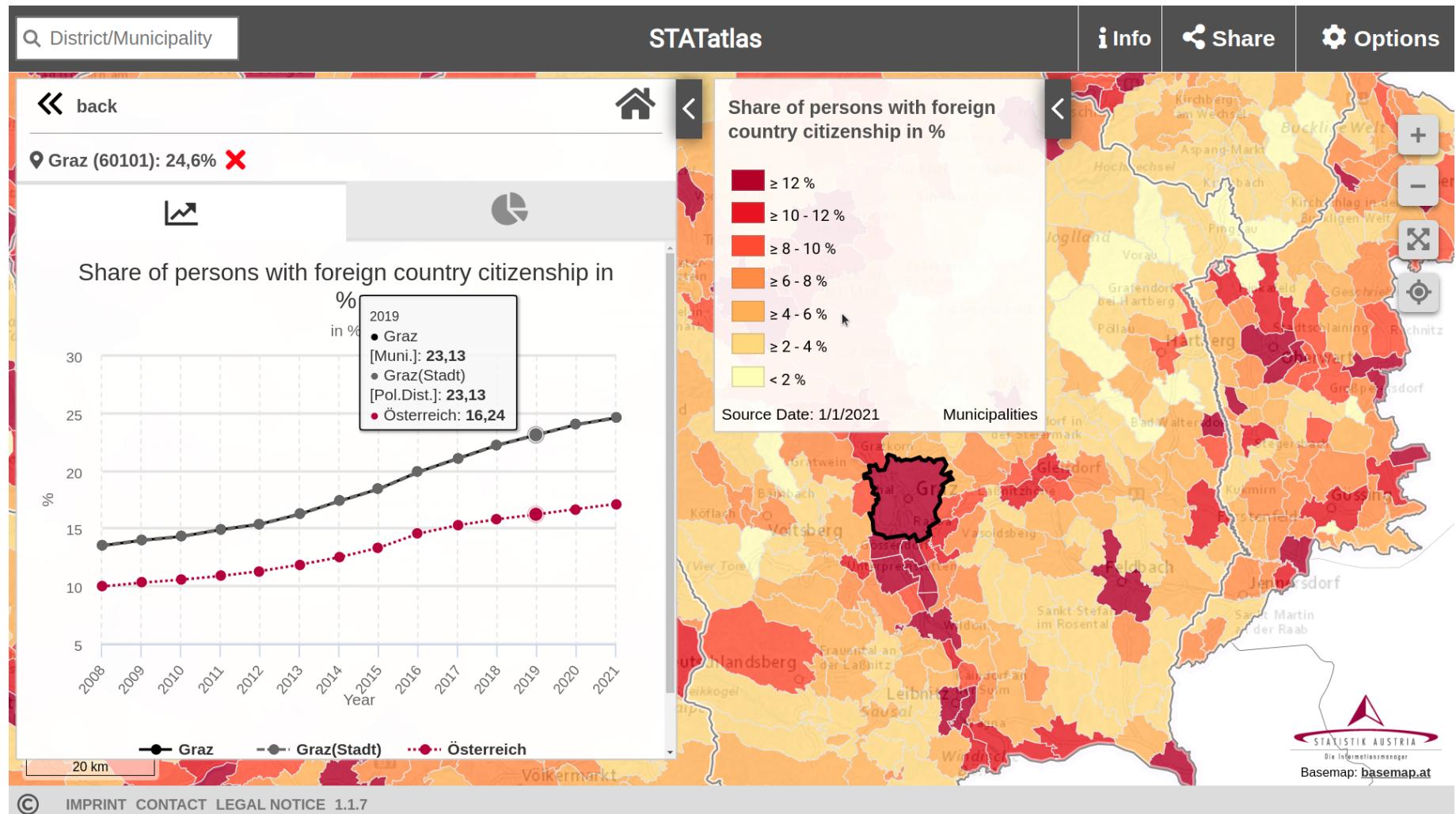
# Hovering over the timeseries on the left gives a tooltip with values for a specific year



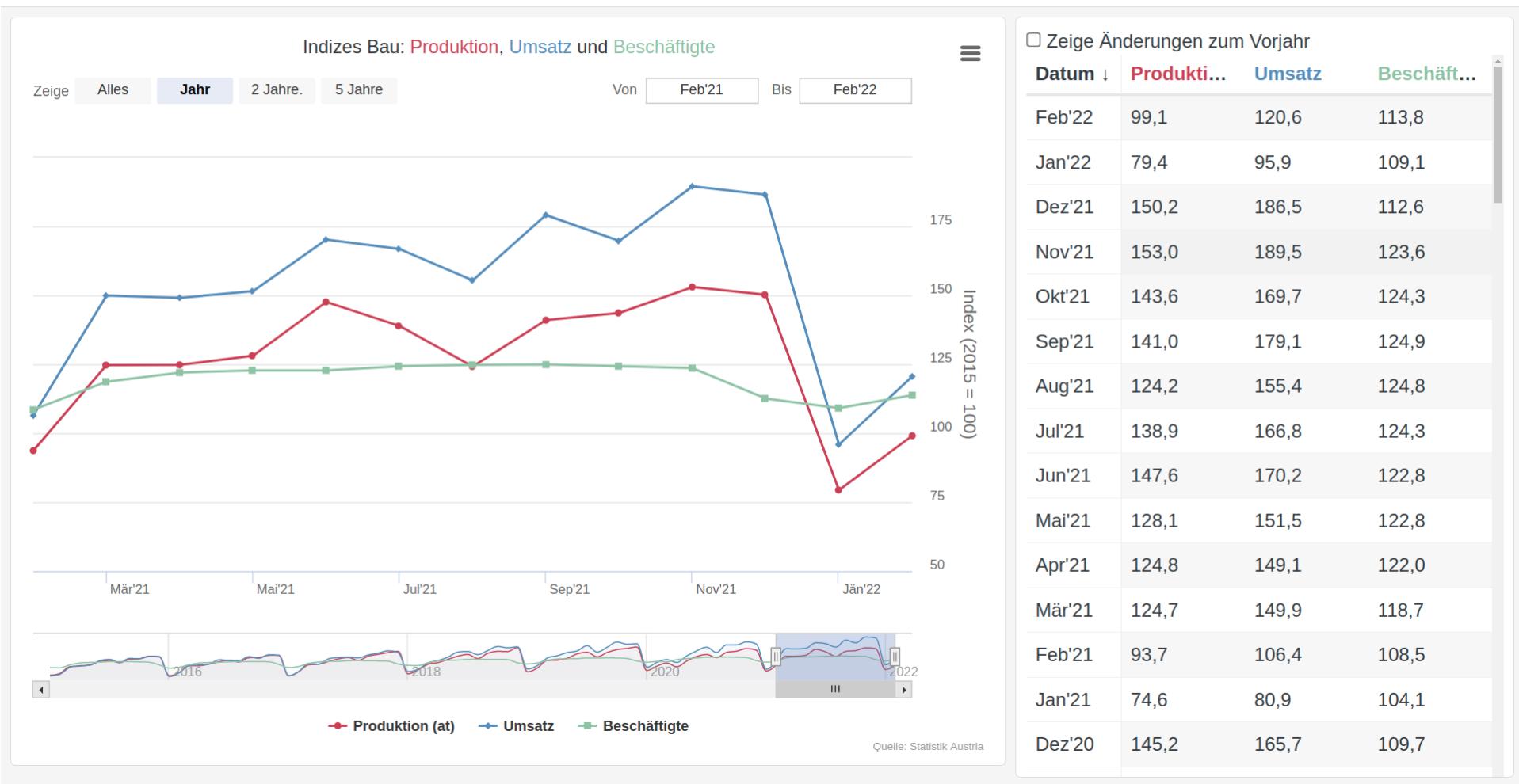
**Clicking on a region (right) will update the timeseries (left). The other two lines are parent regions of the selected region**



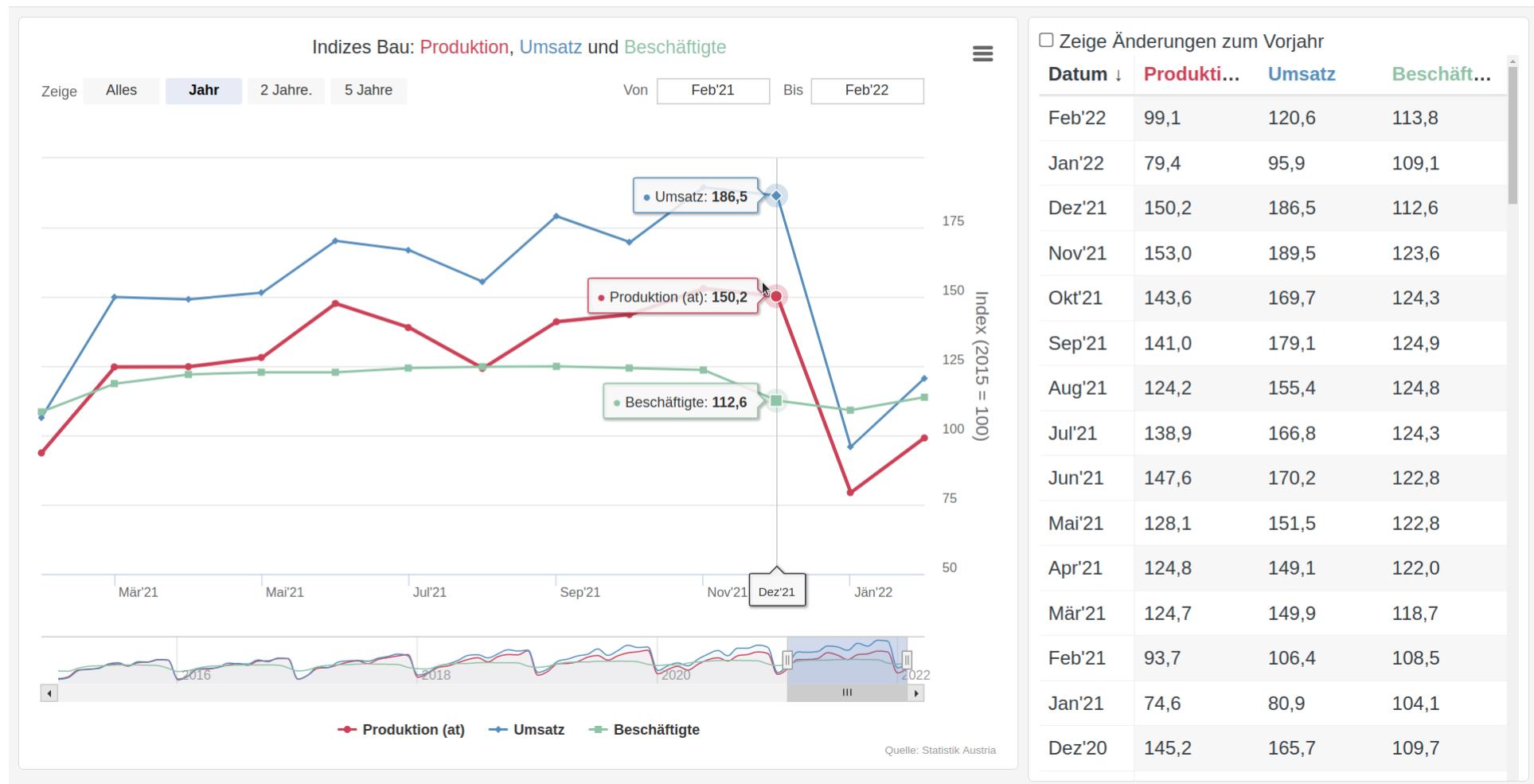
It is also possible to switch the shown values. For example: show information about **migration** instead of **age**



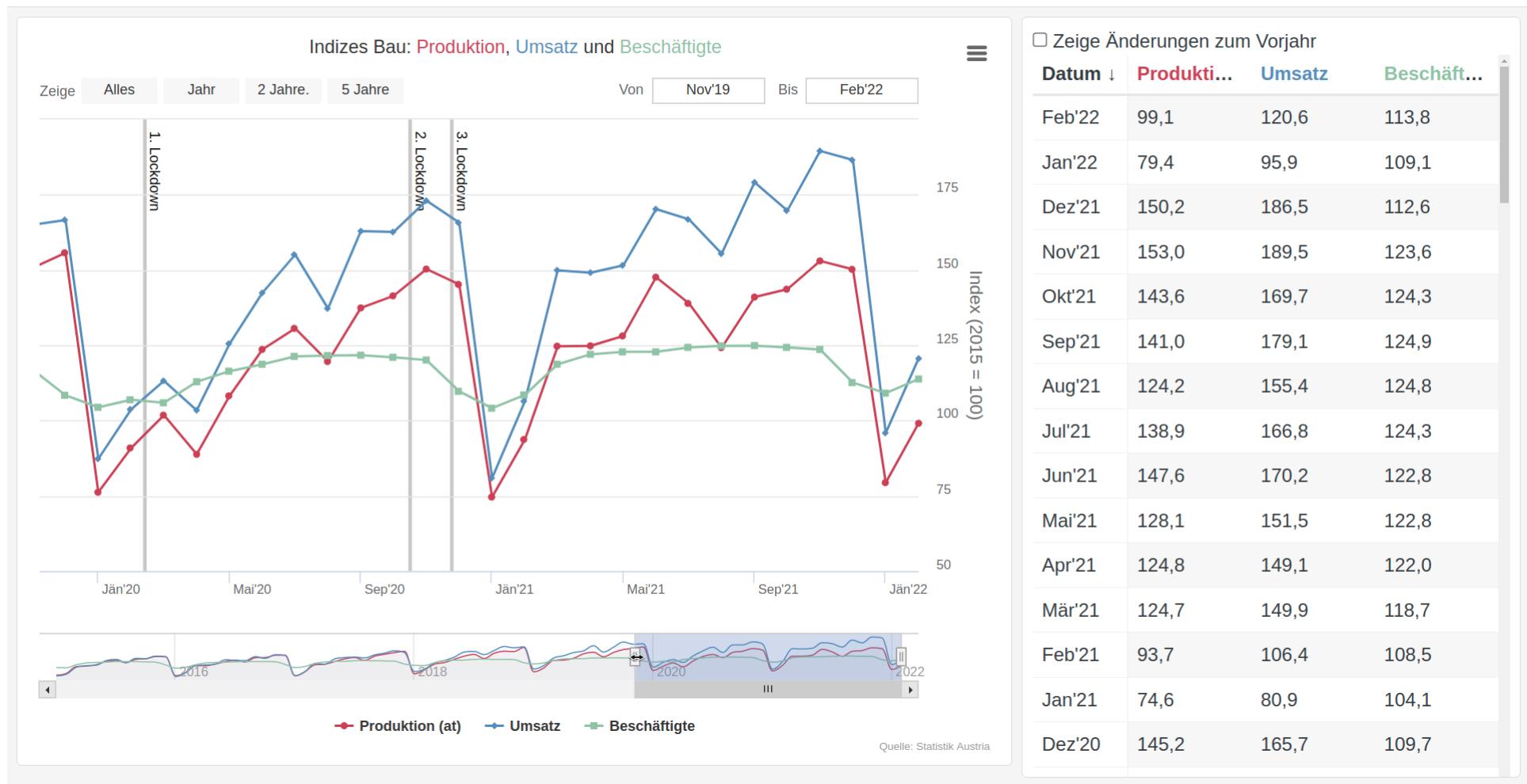
the **Economic Trend Monitor** includes interactive **time series** which are updated weekly



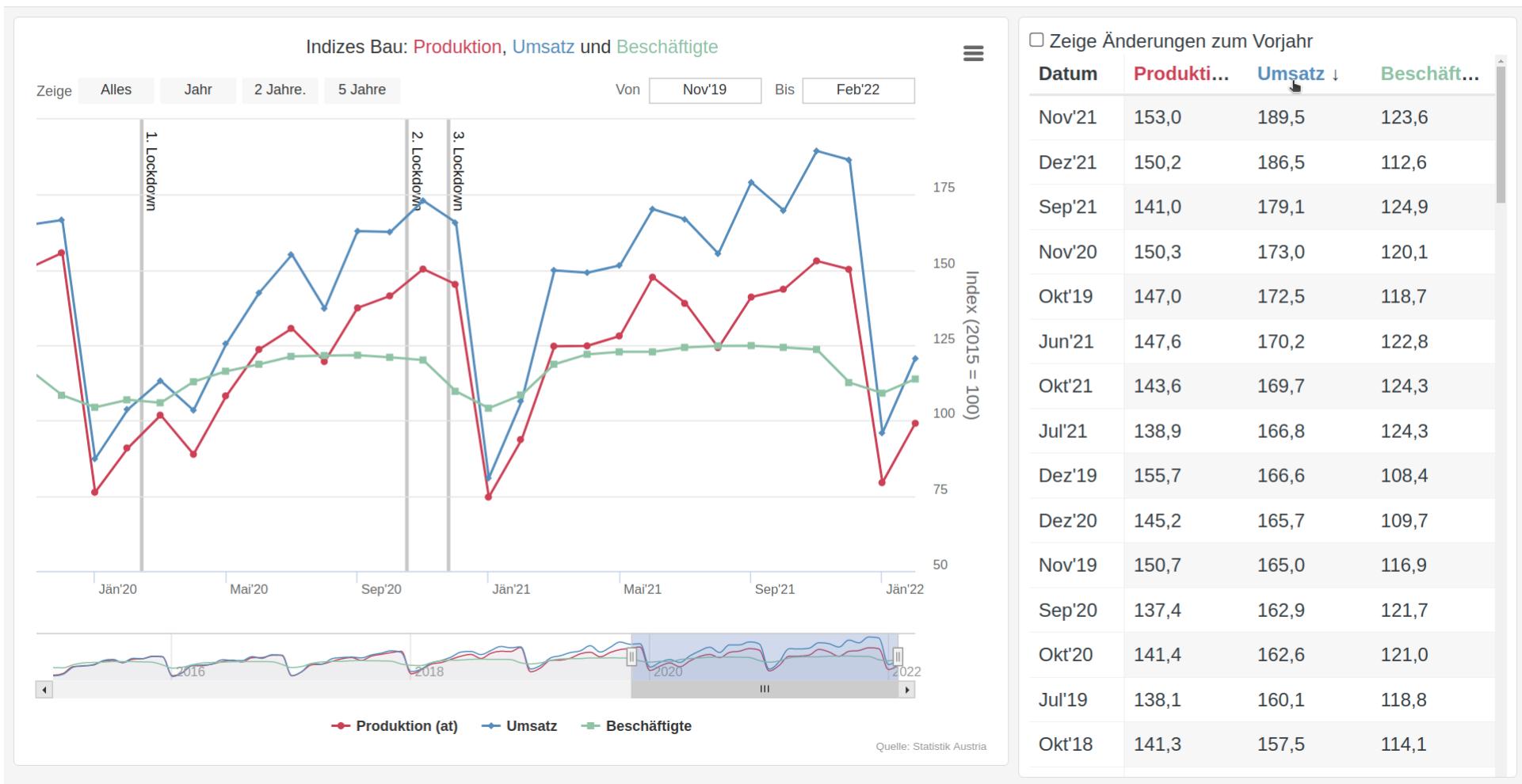
# Hovering over the chart will show a **tooltip** with values for the corresponding time



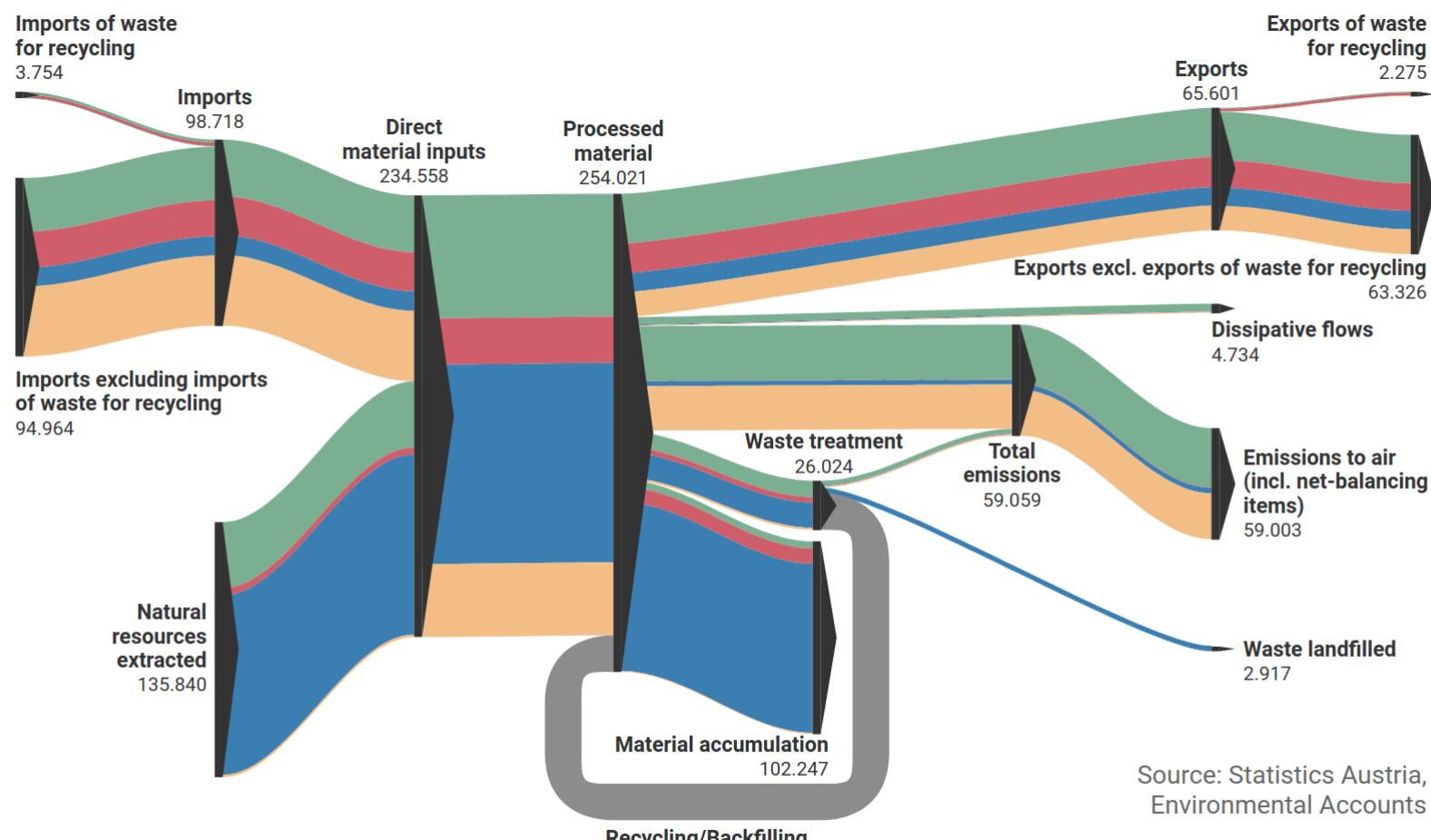
The **handle** at the bottom of the chart can be used to **zoom** out and show a larger timespan of values



The table can be **sorted** by clicking on one of the header cells.  
 Example: Sort descending with respect to revenue



# This Material Flows 2019 include a tailor-made sankey diagram



Source: Statistics Austria,  
Environmental Accounts



Biomass



Metals



Non-metallic minerals

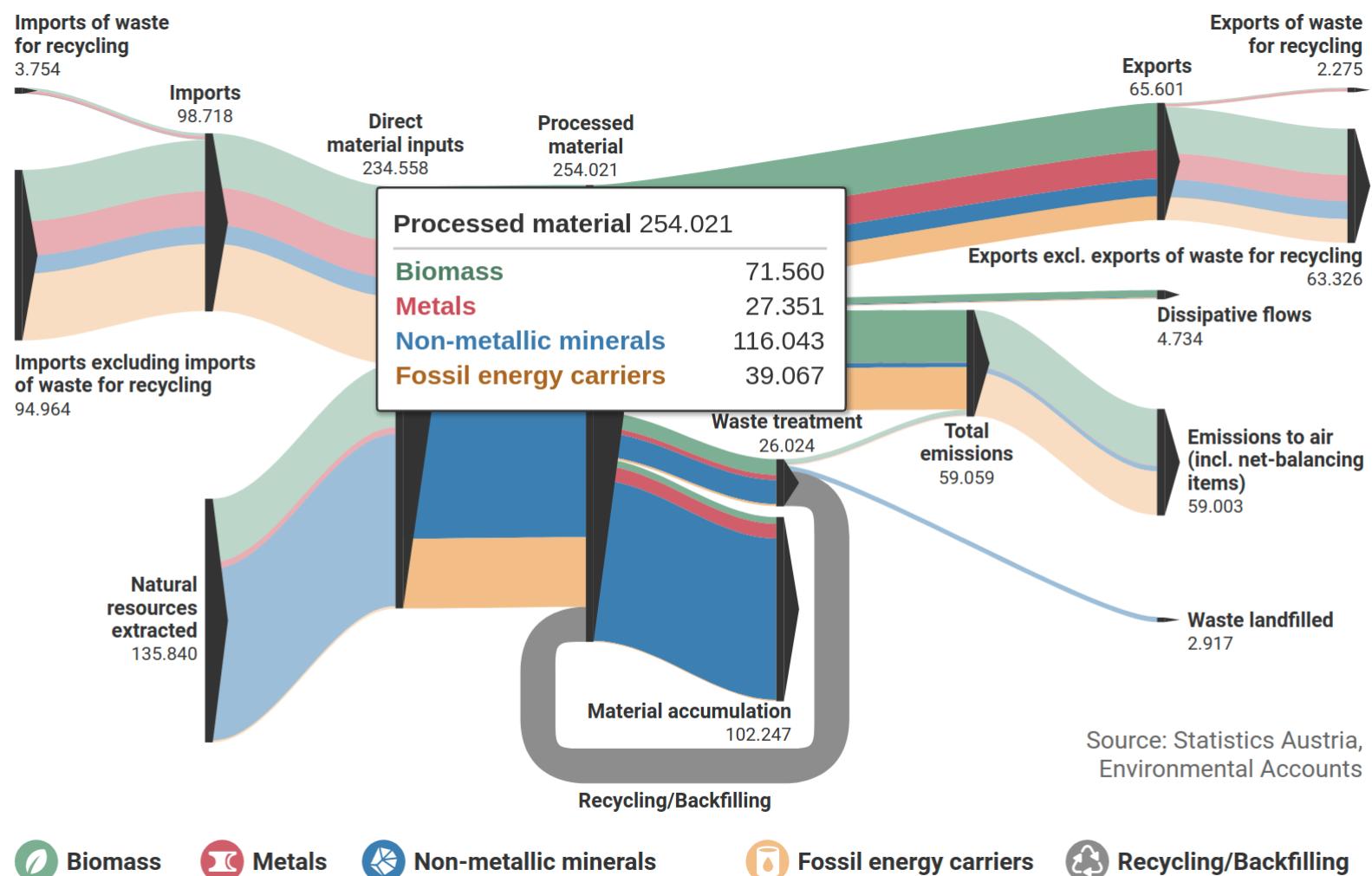


Fossil energy carriers

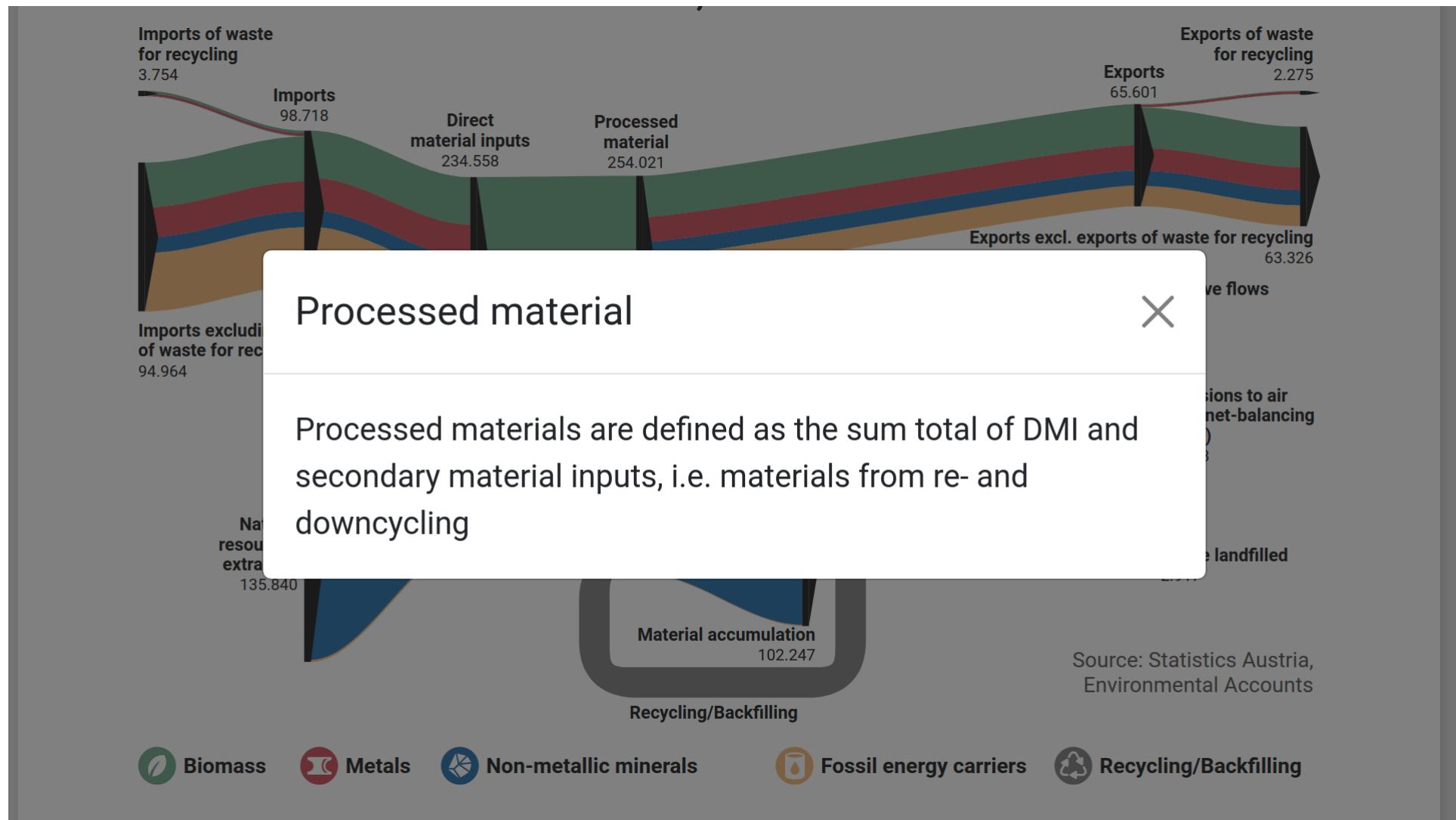


Recycling/Backfilling

When the **mouse** is pointed to a node, it shows a **tooltip** with details



# Clicking on a node shows a modal with a definition



# So what's new?

Going forward, **Statistics Austria** will include **C&Ts** in website articles. This was not possible on our old website because of technical constraints

Whenever interactive **C&T** were used, they were hosted on a separate page and linked from the articles

# For comparison: An article of the **current** webpage



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STATISTICS   PUBLICATIONS & SERVICES   CLASSIFICATIONS   SURVEYS   DOCUMENTATIONS   PRESS   ABOUT US   INDEX A-Z

## ▼ People & Society

▶ Education

Culture

▶ Health

▶ Labour Market

▶ Population

## ▼ Social Statistics

▶ Personal Income

Household Income

Poverty and Social Inclusion

Index of Agreed Minimum  
Wages

## Poverty and social inclusion

Based on EU-SILC (European Community Statistics on Income and Living Conditions) each year results on poverty and social inclusion are published. Key indicators for Austria from EU-SILC 2020 and earlier years are available from the table below.

In 2020 17.5% of the population (1 529 000 people) were considered **at-risk-of-poverty or social exclusion** in terms of the Europe 2020 strategy. 2.7% of the population were severely materially deprived, 13.9% were considered at-risk-of-poverty and 7.1% of those below 60 years of age were living in households with very low work intensity.

more...

Table(s)   Further information   Documentations   Press releases   Publications   General information service

Results (overview): European indicators on social inclusion in Austria 2004 - 2020



Risk-of-poverty or social exclusion by age and gender 2020



# The landing page for the **new** webpage

The screenshot shows the homepage of the Statistics Austria website. At the top left is the logo "STATISTICS AUSTRIA" with a red triangle icon above it and the tagline "The Information Manager". At the top right are links for "Career opportunities", "Surveys", "Bookmarks", and a language selector "EN". Below the header is a navigation bar with links for "Statistics", "Databases", "Services/Tools", "Media", "About us", and a search icon.

The main title "Independent statistics for fact-based discussions and decisions" is centered over a network graph background. Below the title is a search bar with the placeholder "Search for statistics, publications or classification" and a red search button with a magnifying glass icon.

At the bottom, there are six cards with statistical data:

- COVID-19**: Represented by a red coronavirus icon.
- Population**: 2021, 8.9 million. **vs. 2020** (up).
- GDP**: 2021, € 403.4 bn. **vs. 2020** (up).
- CPI inflation rate**: February 2022, 5.9 %. **vs. January 2022** (up).
- Employment rate**: 2021, 72.4 %. **vs. 2020** (no change).
- SDGs**: Represented by the United Nations Sustainable Development Goals logo.

# An article with an embedded STATatlas map

Die Datenaktualisierung erfolgt mit vorläufigen/endgültigen Gesamtjahresergebnissen.

Dank Responsive Web Design kann der Atlas sowohl am Desktop-PC als auch auf mobilen Geräten dargestellt werden.

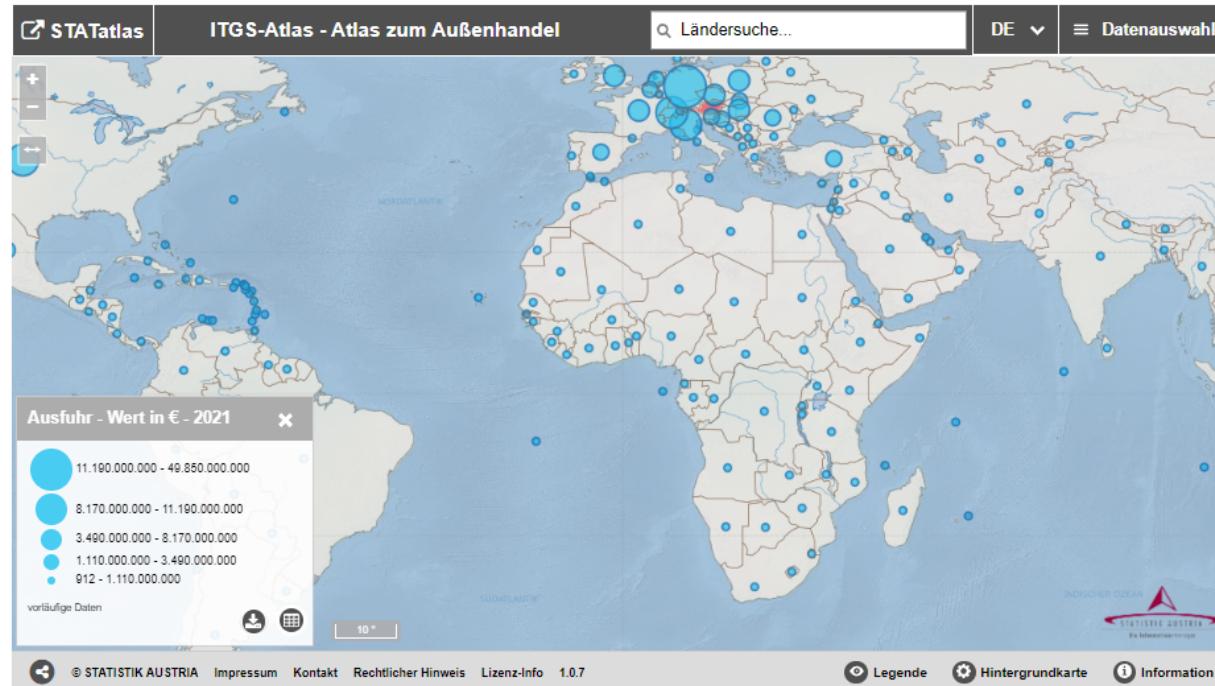
Tabellen, Grafiken, Karten (1)



Highlights



ITGS Atlas



# An article with an embedded interactive table



Karriere Erhebungen Merkliste DE ▾

Statistiken Datenbanken Services/Tools Medien Über uns Q

Startseite / Statistiken / Internationaler Handel / Internationaler Warenhandel / ITGS Hauptdaten

veröffentlicht. Sie basiert auf den Daten der Erhebungssysteme Intrastat, das die grenzüberschreitenden Warentransaktionen innerhalb der EU erfasst und Extrastat, das auf die grenzüberschreitenden Warentransaktionen mit Drittstaaten fokussiert. Rechtlich geregelt wird die ITGS auf EU-Ebene und auf nationaler Ebene. Die nationalen Regeln beziehen sich im Wesentlichen auf die EU Verordnungen und nehmen gleichzeitig auf die national spezifische Situation Bezug.

Die Außenhandelsstatistik stellt eine wesentliche wirtschaftliche Basisinformation über den grenzüberschreitenden Warenverkehr Österreichs mit den EU-Mitgliedstaaten und Drittstaaten dar und ist ein Schlüsselindikator für die Beurteilung der wirtschaftlichen Entwicklung. Die Veröffentlichung der Ergebnisse erfolgt aus österreichischer Sicht nach nationalem Konzept.

Tabellen, Grafiken, Karten (2) (–)

Highlights (–)

(–) Berichtsmonat 01.2022

ITGS	EINFUHR WERT IN EURO	VERÄNDERUNG ZUM VORJAHR IN PROZENT	AUSFUHR WERT IN EURO	VERÄNDERUNG ZUM VORJAHR IN PROZENT	HANDELSBILANZ IN EURO
Gesamthandel	15 286 464 647	32,0	13 579 449 815	21,3	-1 707 014 832
EU-27	9 426 499 074	22,0	9 224 578 050	17,7	-201 921 024
Drittstaaten	5 859 965 573	52,2	4 354 871 765	29,4	-1 505 093 808

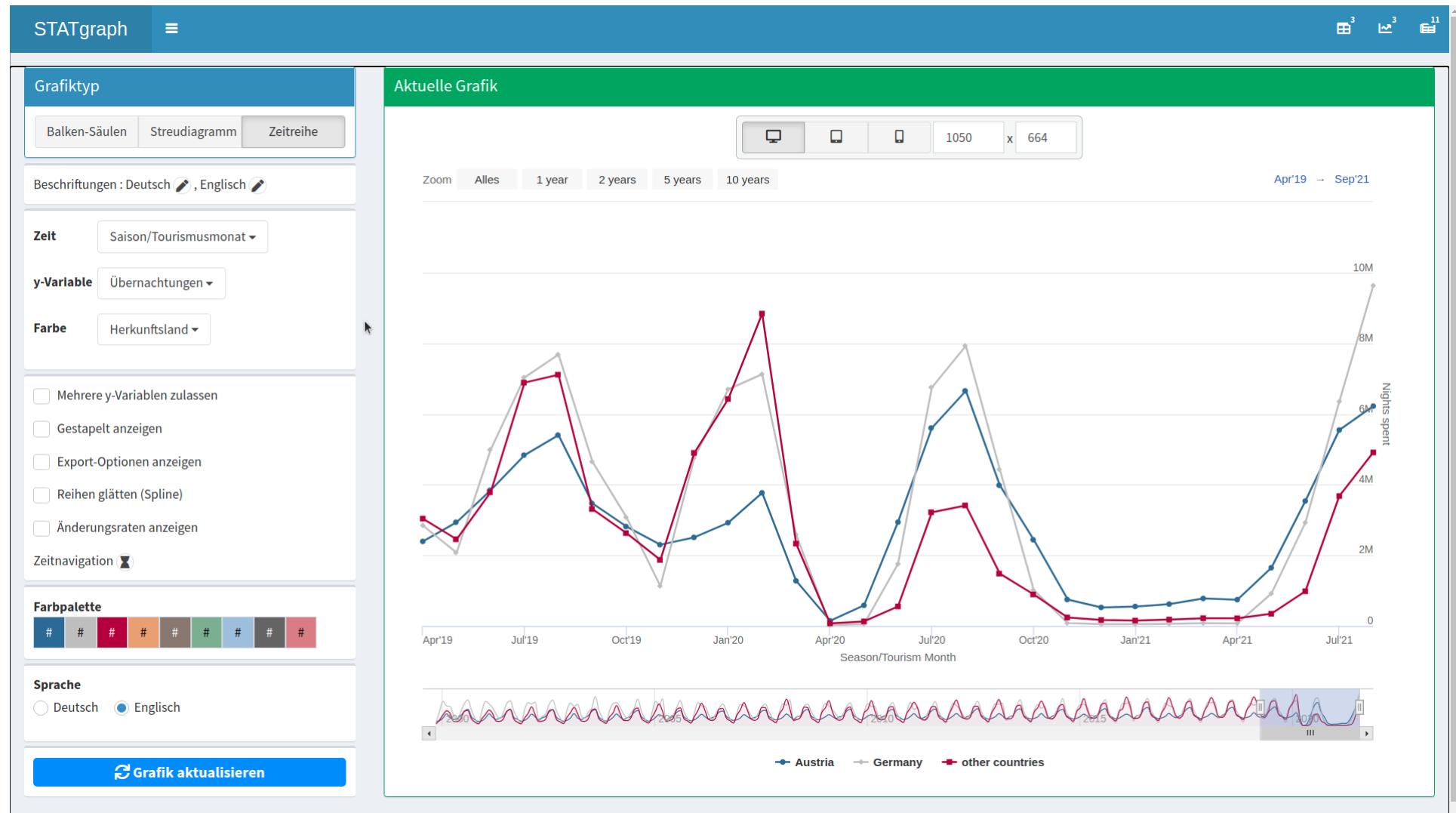
# Creating interactive components

Being able to embed **C&Ts** is great, but the question remains how they can be produced on a large scale

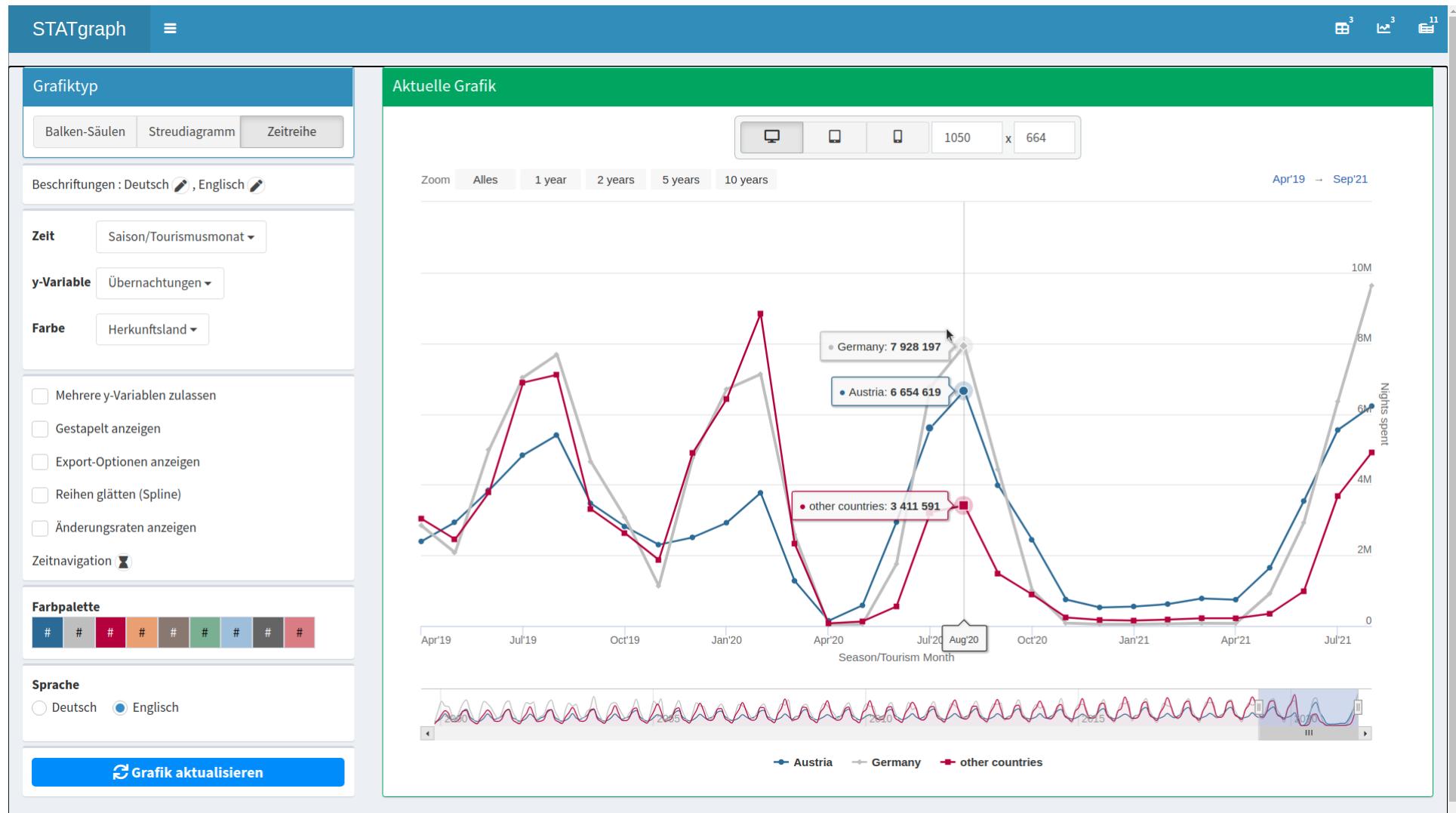
We decided to develop a **C&T builder** web application, which allows article authors to generate **C&Ts** via a graphical user interface

All generated **C&Ts** follow our **corporate design** and produce **accessible, responsive** and **interactive** web components

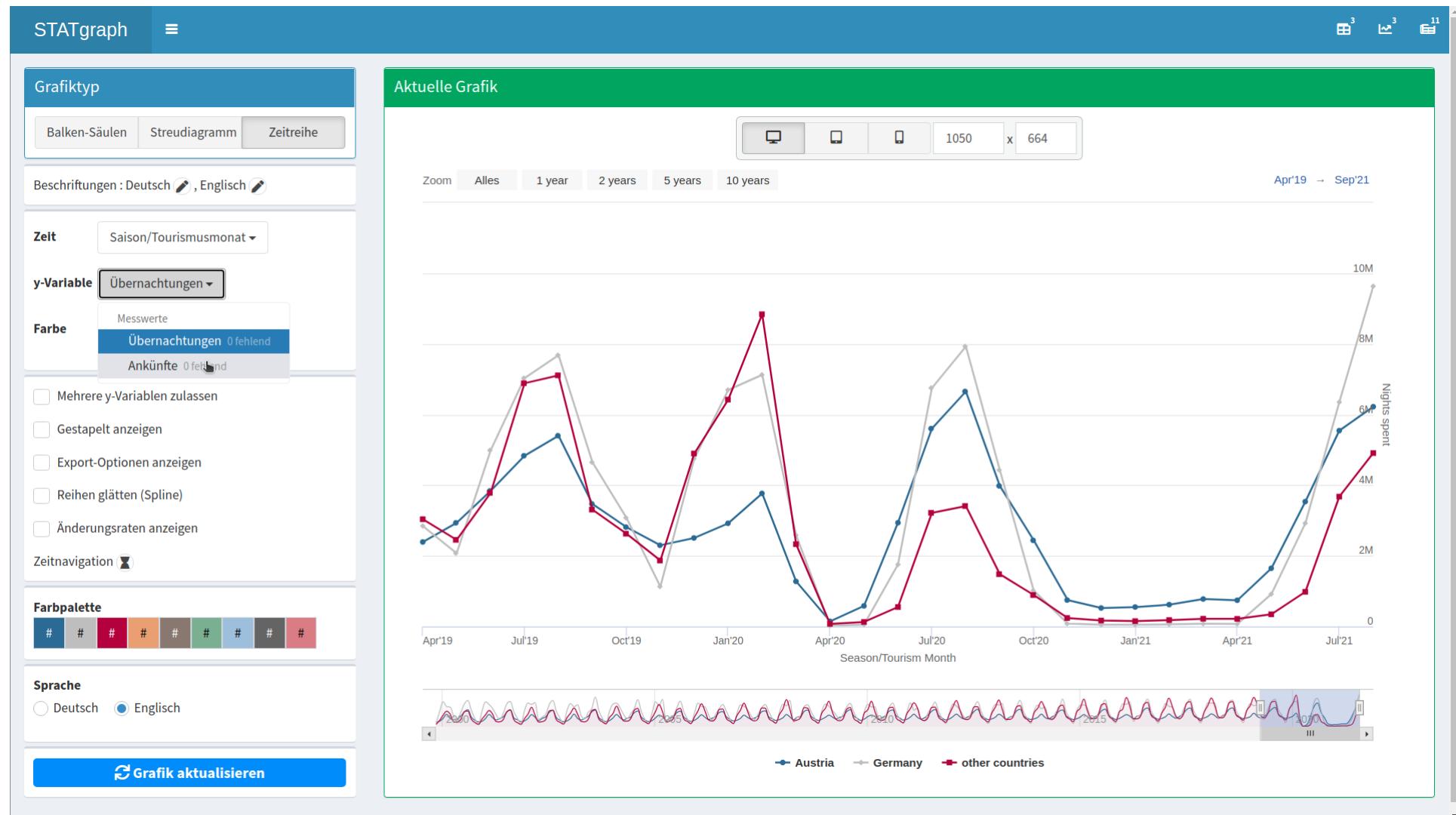
The **C&T builder** provides a chart **preview** on the right and a GUI to customize the chart on the left



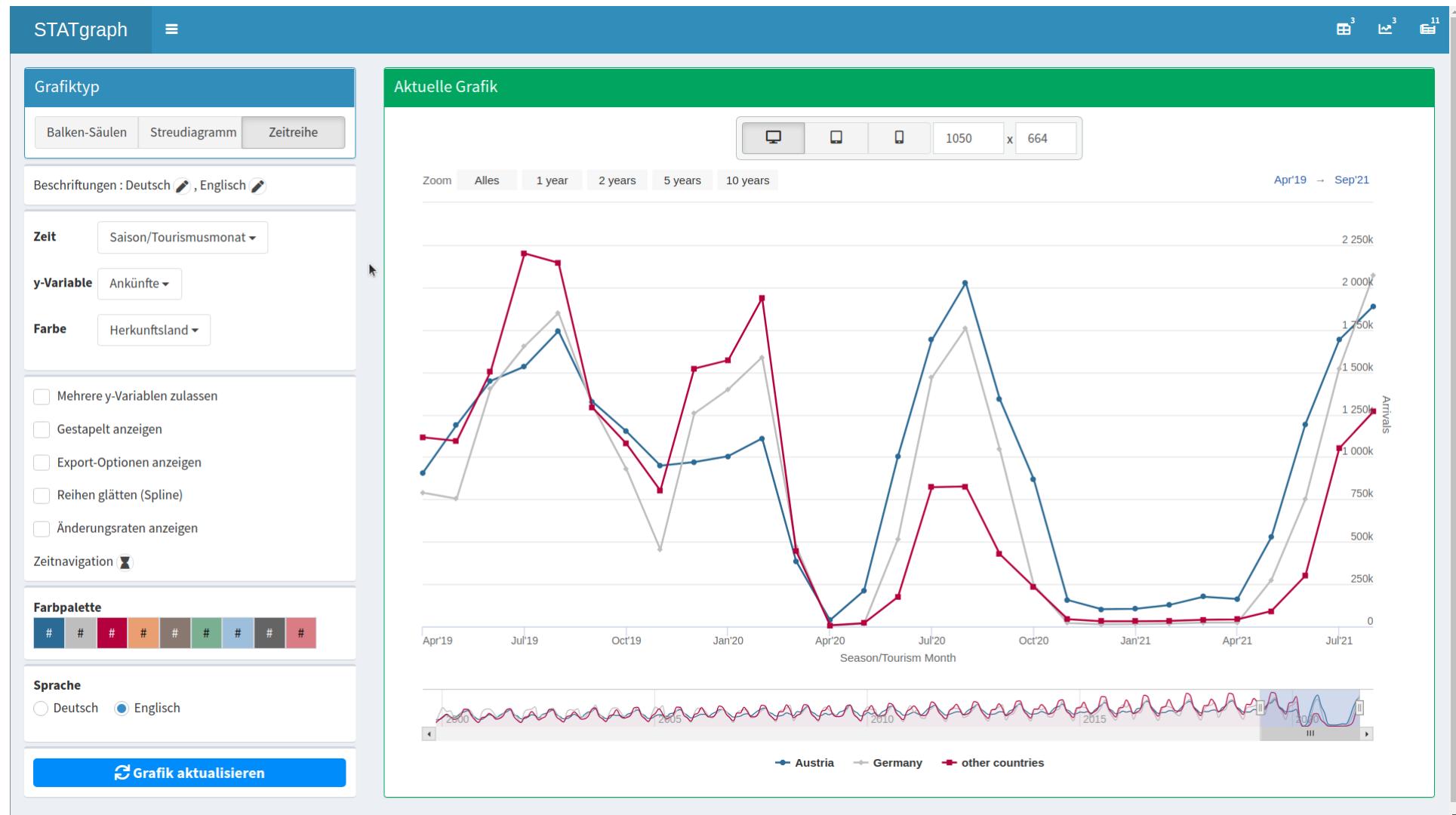
The **preview** on the right supports interactions like **tooltips** which are also available on the website



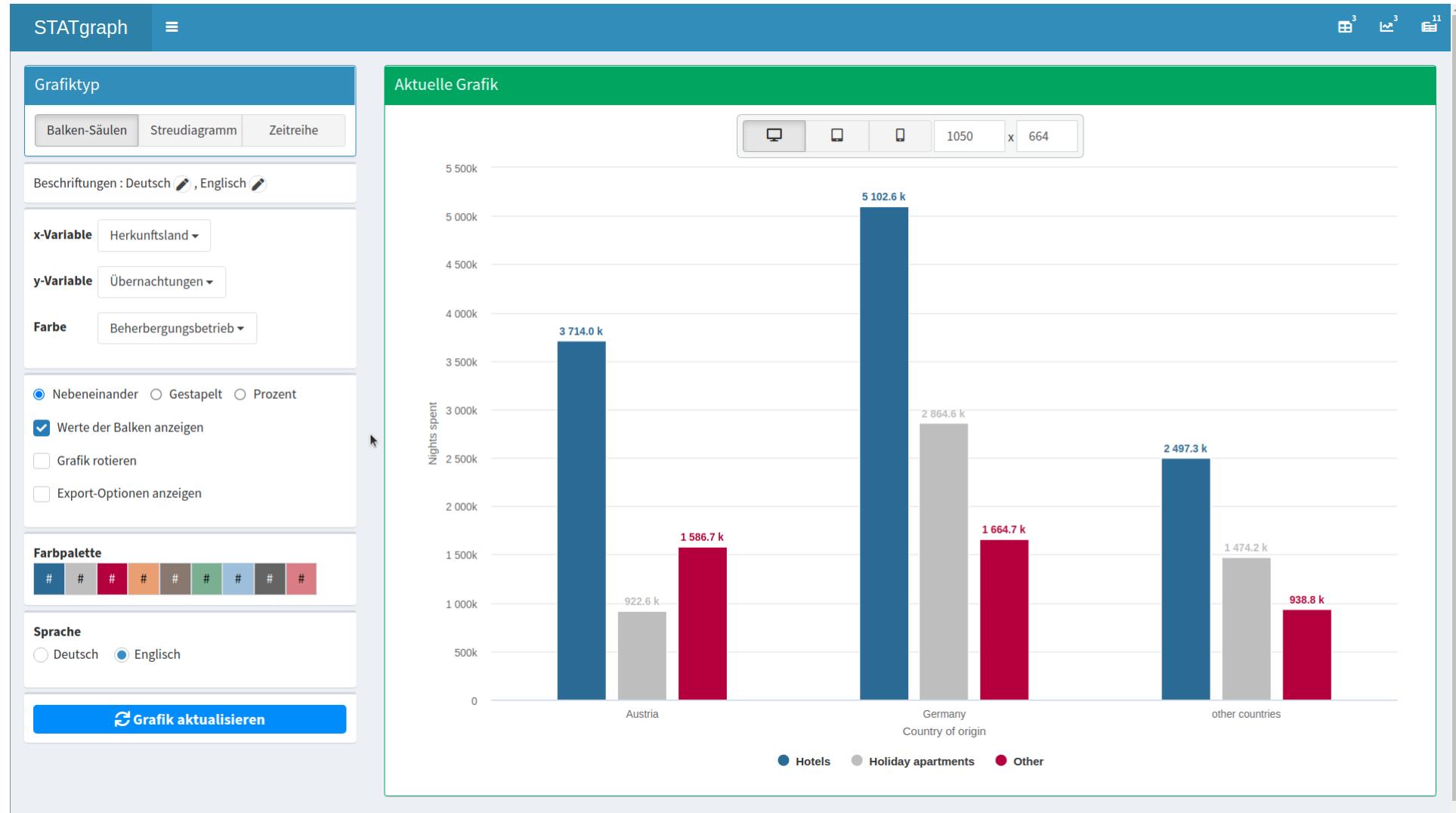
On the left, article authors can customize their charts. For example:  
change the variable on the **y-Axis**



On the left, article authors can customize their charts. For example:  
change the variable on the **y-Axis**



It is also possible to switch to another chart type. Currently, **bar charts**, **time sereies** and **scatterplots** are supported



# Interactive **tables** can be created in a similar fashion

STATgraph

≡

3 3 11

**Optionen**

**Auswahl:**

- akt. Tabelle
- Gruppierung
- Vorschau

**Sprache (für Labels)**

- Deutsch
- Englisch

**TABELLE**  
**ZURÜCKSETZEN**

**Tabellierung**

Search for

SEASON/TOURISM MONTH	COUNTRY OF ORIGIN	ACCOMODATION ESTABLISHMENT	NIGHTS SPENT	ARRIVALS
Nov.99	Austria	Hotels	858 602	371 215
Nov.99	Austria	Holiday apartments	22 398	5 365
Nov.99	Austria	Other	386 865	67 272
Nov.99	Germany	Hotels	620 973	223 856
Nov.99	Germany	Holiday apartments	56 012	13 095

1 2 3 ...

# The table shows 5 entries per page

STATgraph

3 3 11

Optionen

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[TABELLE](#)  
[ZURÜCKSETZEN](#)

Tabellierung

Search for

SEASON/TOURISM MONTH	COUNTRY OF ORIGIN	ACCOMODATION ESTABLISHMENT	NIGHTS SPENT	ARRIVALS
Nov.99	Germany	Other	85 583	24 262
Nov.99	other countries	Hotels	544 074	235 343
Nov.99	other countries	Holiday apartments	30 265	6 493
Nov.99	other countries	Other	41 945	14 433
Dec. 1999	Austria	Hotels	928 834	346 040

1 2 3 ...

# Search strings can be used to **filter** the data

STATgraph

☰

3 3 11

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**TABELLE**  
**ZURÜCKSETZEN**

**Tabellierung**

Other				
SEASON/TOURISM MONTH	COUNTRY OF ORIGIN	ACCOMODATION ESTABLISHMENT	NIGHTS SPENT	ARRIVALS
Nov.99	Austria	Other	386 865	67 272
Nov.99	Germany	Other	85 583	24 262
Nov.99	other countries	Hotels	544 074	235 343
Nov.99	other countries	Holiday apartments	30 265	6 493
Nov.99	other countries	Other	41 945	14 433

1 2 3 ...

# Tables can be **sorted** by clicking on a table header

STATgraph

≡

3 3 11

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**TABELLE**  
**ZURÜCKSETZEN**

**Tabellierung**

Other						
SEASON/TOURISM MONTH	COUNTRY OF ORIGIN	ACCOMODATION ESTABLISHMENT	NIGHTS SPENT	ARRIVALS		
Feb. 20	other countries	Hotels	5 012 538	1 237 342		
Feb. 16	other countries	Hotels	4 730 864	1 107 500		
Feb. 08	other countries	Hotels	4 662 752	931 682		
Feb. 18	other countries	Hotels	4 647 648	1 155 526		
Feb. 19	other countries	Hotels	4 640 393	1 180 618		

**1** 2 3 ... **4**

# How it works



The charts are generated with the JavaScript package **highcharts**, which supports zoomable charts, tooltips and more out of the box



The tables are generated with the javascript package **datatables**, which supports searchable and sortable tables



The **C&T builder** app was written with **shiny**, which is a web application framework for the **R language**

# Data Import

There are two options for importing data in the **C&T builder** app

- **STATcube** data can be imported via a **REST API**
- Data from the **open.data portal** is parsed from csv files

The import logic is implemented in the R package **STATcubeR**, which is **open source** and available via github



<https://github.com/statistikat/STATcubeR>

# Combining Charts and Text



Our website articles are written with a content management system (**CMS**) called **TYPO3**



**C&Ts** from the **C&T builder** app can be exported into a database



The **C&Ts** from the database can be imported by the **CMS** via a **REST API**, which was written with the **R** package **plumber**

# Other Contributors



The **stylings** were coordinated with the **front end developers** of our new website



New **features** are added continuously based on suggestions from our **article authors**



Our **layout & design team** gives valuable feedback regarding **accessibility** and corporate design

# Summary

- The new website will launch in **June 2022**
- Website articles will contain interactive **charts and tables**
- A **C&T builder** app was developed so **article authors** can create C&Ts easily, quickly and **consistently**
- **Stay tuned** to see all this in action in a few weeks

# Thank you very much for your attention!

## You saw: Behind the Scenes of Interactive Charts

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