wege entstehen, indem wir sie gehen paths emerge in that we walk them





# Graz Climate Change Indicators: A data portal backing climate narratives towards reaching the Paris climate goals

Gottfried Kirchengast <sup>(1,2)</sup> and Moritz Pichler <sup>(1)</sup>

<sup>(1)</sup> Wegener Center for Climate and Global Change (WEGC), University of Graz, Graz, Austria

<sup>(2)</sup> Institute of Physics, University of Graz, Graz, Austria

(Contact e-mail: gottfried.kirchengast@uni-graz.at)

EGU 2024, 16 April 2024, Session EOS1.8

- Telling climate stories: platforms, tools, and methodologies for accurate and engaging science communication

#### Welcome to GCCI.Earth! (equivalently, ClimateTracer.Earth)





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GCCI.Earth provides reliable **recent-past monitoring information jointly with current-state nowcasting and Paris-compliant future projection information**, over the critical climate change timeframe from 1960 via 1990 and 2020 to 2050. In doing so, it focuses on **greenhouse gas emissions (GEM-GHG Emissions Monitoring)**, **global climate warming (CWM-Climate Warming Monitoring)**, and climate change impacts in terms of **weather and climate extremes** (EWM-Extreme Weather Monitoring; released spring 2024).

Dive in through the Menu on top or right here: Emissions - Global, Emissions - Europe, Emissions - Austria, Warming - Global, Extremes - Europe, Extremes - Austria. The charts are generally made to be self-explanatory - for a one-stop overview of the current content, including detailed data-source references, see the GCCI documentation.

Welcome to visit also CarbManage.Earth, for which this data portal provides essential background and context information. Learn there on "Carbon Management", a new approach empowering actors at all public, institutional, and personal levels to reach GHG emission reduction targets compliant with the climate goals of the Paris Agreement.

The portal is repeatedly updated - stay tuned.

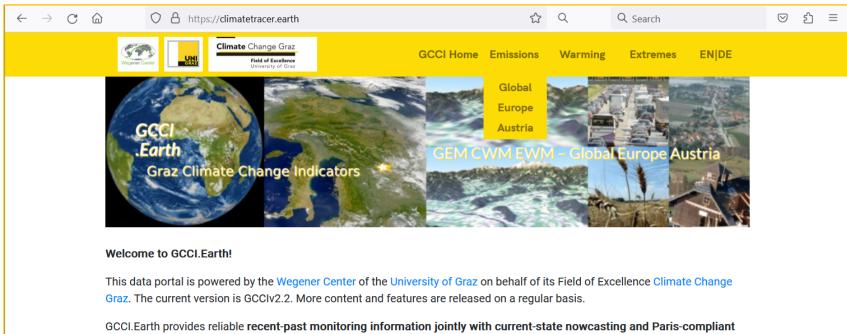




#### The portal <u>gcci.earth</u> (equivalently, <u>climatetracer.earth</u>)... (1)







future projection info focuses on greenhous Monitoring), and clima released spring 2024).

Dive in through the Me Extremes - Europe, Ext current content, includ

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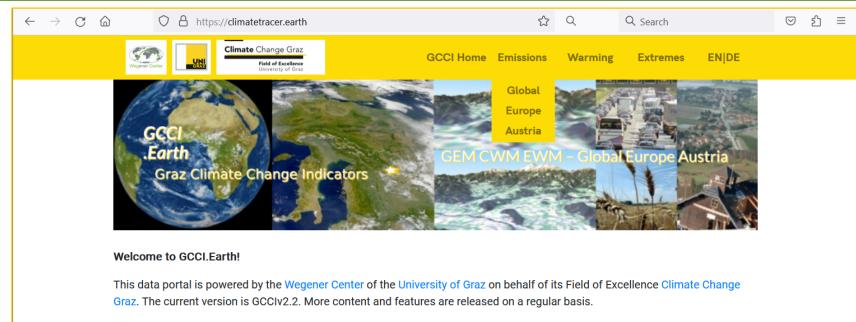
> helps to bridge climate science, narratives and action and provides, in an easy-to-use way with focus on informative indicator time series, reliable recent-past monitoring information jointly with current-state nowcasting and Paris-compliant future projection information, over the critical climate change timeframe from 1960 via the Present to 2050.

The portal is repeatedly updated – stay tuned.

#### The portal <u>gcci.earth</u> (equivalently, <u>climatetracer.earth</u>)... (2)







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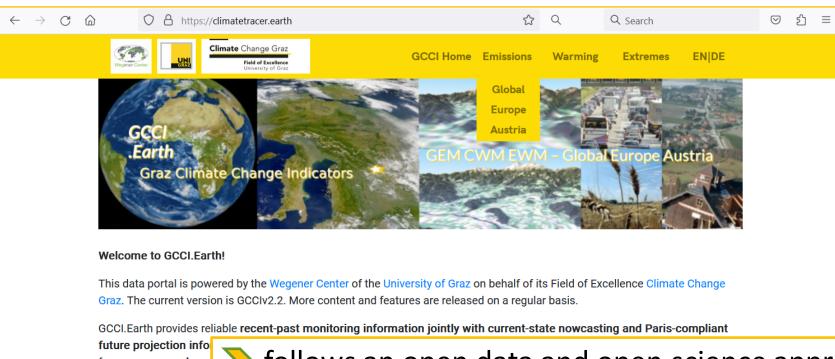
> focuses on three indicator classes that span the climate change problem and projected solution pathways, from causes to impacts: greenhouse gas emissions ("Emissions"), global climate warming ("Warming"), and climate change impacts in terms of weather and climate extremes ("Extremes") [this latter one released later in 2024].

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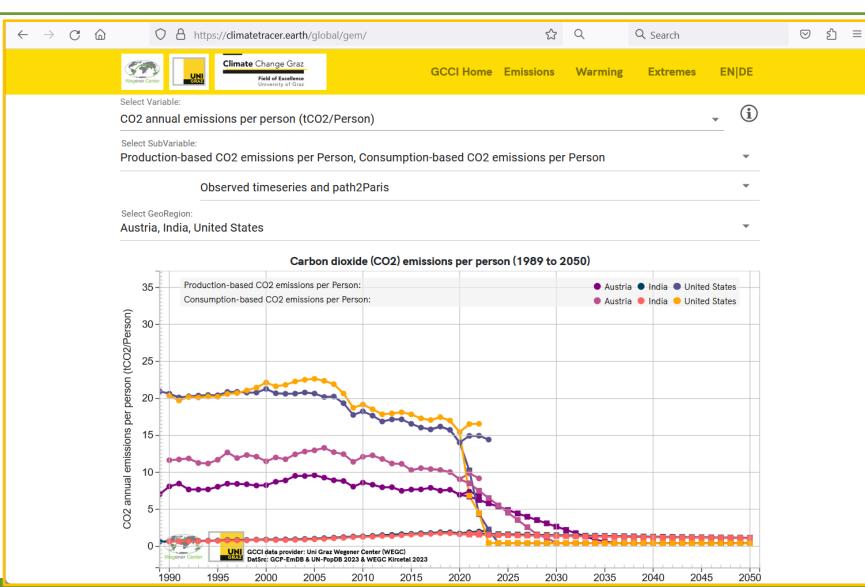
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follows an open data and open science approach, which is made to enable broad uptake and to support climate solution narratives on "pathways to Paris", also linking to the co-developed climate solutions framework "Carbon Management – carbsmart2Paris" (short intro infos klimaneutral.uni-graz.at/carbon-management, web carbmanage.earth).

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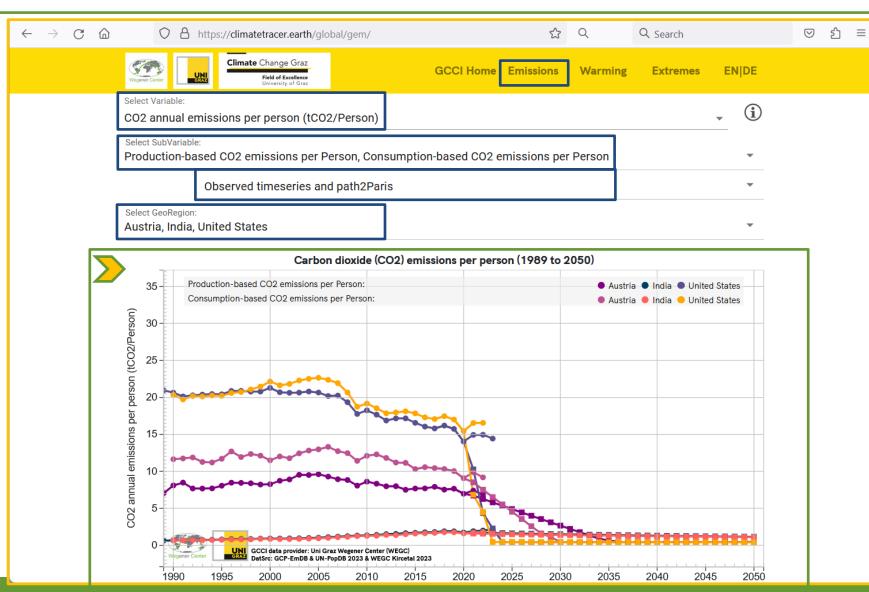
















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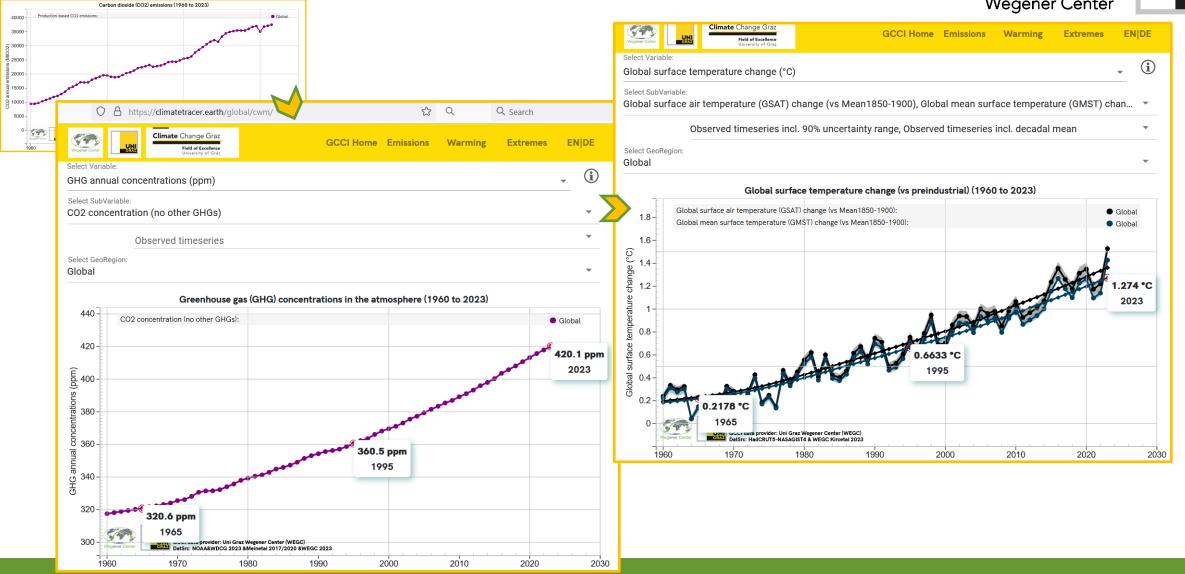


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# Example *Warming* | insight to links emissions > global warming







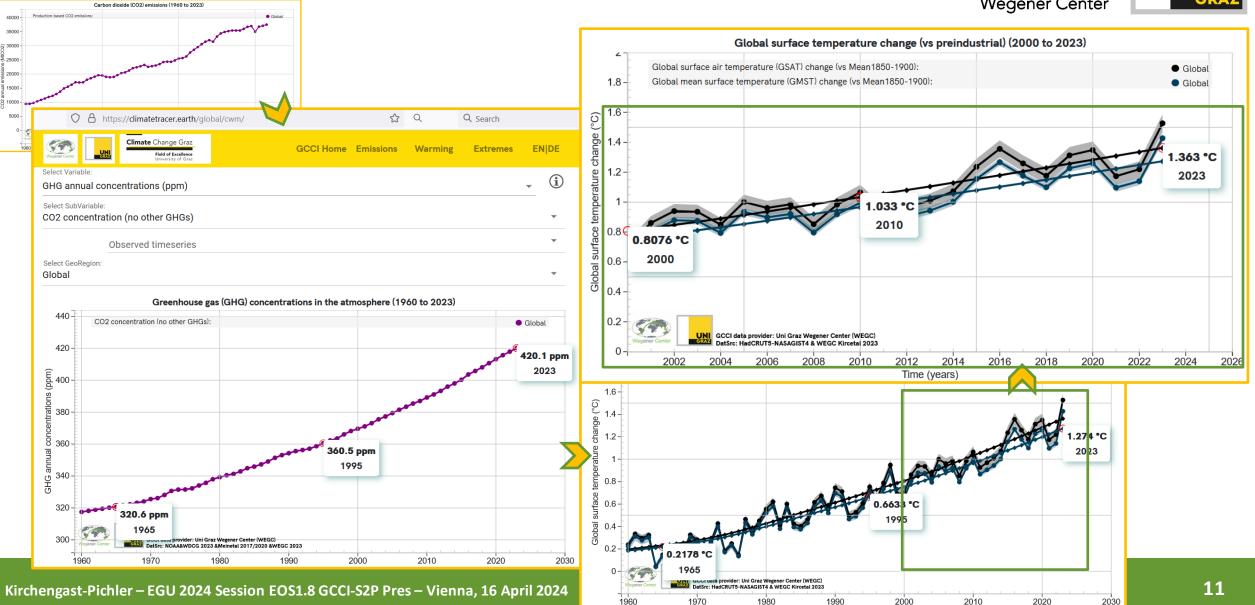
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## Example *Warming* | insight to links emissions > global warming





Wegener Center



# Strong science backing, e.g., links emissions > global warming



Time (years)

GRAZ Annual CO<sub>2</sub> emissions (E<sub>CO2</sub>) 80 Effective radiative forcing (ERF) relative to 1850 (FCO2, FANT) observed 70 adiSSP5-8.5 5.0 CO2 hist Ē 60 adiSSP2-4.5 4.5 ANT hist 50 Eco2 (GtCO2/ adjSSP1-2.6  $F_{ANT}$  (Wm<sup>-2</sup>) 4.0 adjSSP5-8.5 adjSSP1-1.9 40 3.5 adjSSP2-4.5 3.0 30 adjSSP1-2.6 25 20 adjSSP1-1.9 20 F<sub>C02</sub> 10 15 10 0 0.5 2000 2020 1860 1880 1900 1920 1940 1960 1980 2040 0.0 Cumulative CO<sub>2</sub> emissions since  $1850(\Sigma E_{CO2})$ 1880 1900 1920 1940 1980 2000 2020 1860 1960 2040 Global surface air temperature (GSAT) anomaly vs Obs1850-1900 ( $\Delta T_s$ ) observed 4000 djSSP5-8.5 25 observed annual (Obs) adjSSP5-8.5 adjSSP2-4.5 8 3000 adjSSP2-4.5 observed decadal-mean adjSSP1-2.6 20 <u>g</u> modeled ANT (TLM) adjSSP1-2.6 adjSSP1-1.9 2000 adjSSP1-1.9 ΔT<sub>5</sub> (°C) 15 10 1000 0.5 0.0 1860 1880 1900 1920 1940 1960 1980 2000 2020 2040 Atmospheric CO<sub>2</sub> concentration (C<sub>CO2</sub>) 1860 1880 1900 1920 1960 1980 2000 2020 2040 550 observed Time (years) adjSSP5-8.5 500 adiSSP2-4.5 Global surface air temperature (GSAT) anomaly vs Obs1850-1900 ( $\Delta T_{c}$ ) adjSSP1-2.6 450 ₫ adjSSP1-1.9 25 observed annual (Obs) adjSSP5-8.5 00 C 400 adjSSP2-4.5 observed decadal-mea 20 350 modeled ANT (TLM) adjS\$P1-2.6 300 adjSSP1-1.9 õ 15 2020 2040 1860 1880 1900 1920 1940 1960 1980 2000  $\Delta T_s$ 10 0.5 0.0 1960 1970 1980 1990 2000 2010 2020 2030 2040 2050

UNI

#### Strong science2public, e.g., Carbon Management framework





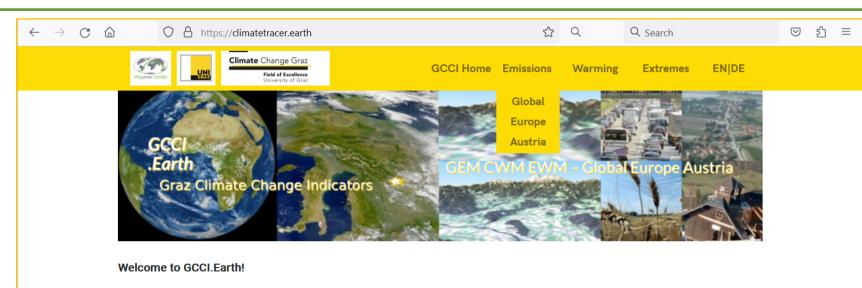


[Kirchengast et al. WEGC RB1-2021; accessible online (including individual-sections access) via https://doi.org/10.25364/23.2021.1]

### Conclusions – Welcome to <u>GCCI.Earth</u>! (or <u>ClimateTracer.Earth</u>)







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