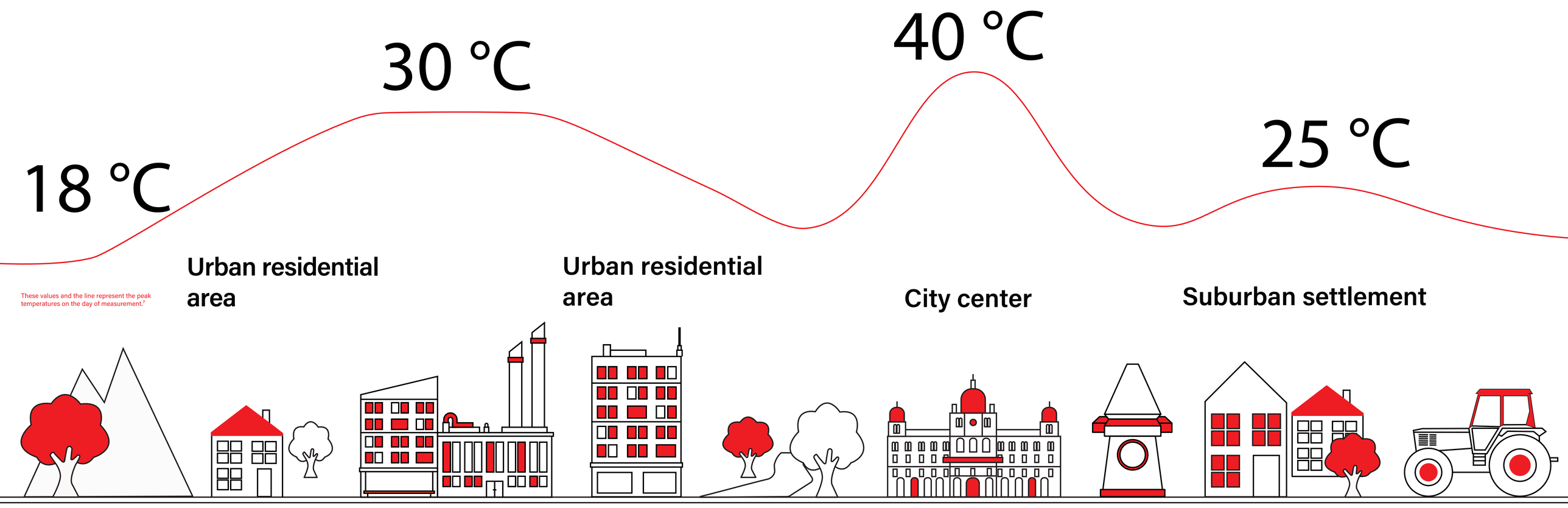
Heat

And why we must not underestimate it

The increasing heat leads to far-reaching consequences. Both nationally and internationally, cities and agriculture are particularly affected. Forest fires[1], declining groundwater levels, and desertification or steppe formation are exacerbated by the anthropogenic greenhouse effect.[2] By the end of the century, the number of tropical days (above 30 °C) in Graz and southeastern Styria will increase significantly. So-called dog days will become the norm. In addition to peak temperatures, the frequency and duration of extremes in the form of heatwaves and droughts will also increase.[3] Cool nights, especially in urban areas, will continue to decrease due to the heat island effect.[4] The number of annual heat-related hospitalizations and deaths will rise.[5][6]

Urban heat islands

The graphic shows a typical temperature profile across a city with different types of land use. The data comes from a thermal aerial survey conducted in late summer 2021 in Graz.[7] It highlights the heat island in the city center. Reasons include high surface sealing, a lack of green spaces (or insufficient shading), and heat production (traffic and waste heat from cooling devices) in the city.[8]
Tree shading can cool the air above asphalt surfaces by more than 20 °C in summer.[9] The heat negatively impacts the well-being and health of urban residents.[10][11]



Too hot to handle?

Is the world on fire?

During extreme drought, the fire risk increases. A small spark from a cigarette or even from a power line can be enough to trigger a forest fire. Forest fires no longer only devastate parts of Mediterranean countries, California, or Australia. They no longer only occur in the summer, as recent reports from late winter and spring 2023 showed.[12]

Large fires often affect numerous settlements or entire cities, where people lose their possessions, and some even their lives. Therefore, we must absolutely heed the relevant warnings, regulations, and prohibitions to reduce the risk of fire.[13]

Are we running out of water?

Due to the rising average temperature, the growing season is extended.[14] This means that sowing can occur earlier and crops can be grown longer, which increases overall water demand.

When it is too warm in winter, preventing the formation of a snow cover, or when there is too little rainfall, the soil lacks moisture, which promotes droughts throughout the year. Plants thus receive too little water and need to be irrigated to prevent them from drying out. If more groundwater is withdrawn for irrigation than is replenished – which is certainly the case when rain is absent – the groundwater level drops. This affects the drinking water supply.[15] Additionally, when many swimming pools are filled in gardens during spring, this exacerbates the problem.[16]

Today, some areas already experience water stress at certain times, especially when rainfall is lacking. The eastern part of Austria is particularly at risk due to a decrease in groundwater replenishment.[17]

Will we soon have no glaciers left?

Due to the rise in temperature, glaciers are melting worldwide.[18] This affects downstream water resources that are fed by glacier water.[19]

In Austria, by the end of the century, all smaller and medium-sized glaciers are likely to be completely gone, and the larger glaciers will have significantly shrunk.[20] For example, the Pasterze, Austria's largest glacier, is retreating further and will break off in a few years.[21] Dry winters and warm summers are particularly harmful to the glaciers.[22]

The melting of glaciers and thawing permafrost threaten the soil stability of mountain slopes, as loose debris can no longer be held together by the ice. This poses a danger for hiking in the mountains, as well as for roads and railways along steep slopes.[23]

[1] vgl. IPCC, 2021, S. 1519
[2] vgl. IPCC, 2019c, S. 14ff., 20
[3] vgl. APCC, 2019, S. 33, 39
[4] vgl. APCC, 2018, S. 70, 136f., 142
[5] vgl. IPCC 2021, S. 1781
[6] vgl. APCC, 2018, S. 70, 231, 278
[7] Eigene Darstellung auf Datenbasis der KIS/Thermalbefliegung vom 09.09.2021 mittags über Graz (vgl. Land Steiermark, 2021), um die Temperaturunterschiede zu verdeutlichen.
[8] vgl. ZAMG, 2021
[9] Messungen des Naturschutzbundes Steiermark, vgl. Gepp, 2019
[10] vgl. APCC, 2018, S. 136f.
[11] vgl. IPCC, 2021, S. 1781
[12] vgl. ORF, 2023c
[13] Beispiel vom März 2023: Land Steiermark, 2023a
[14] vgl. ClimaMap, 2018b
[15] vgl. APCC, 2019, S. 28, 38
[16] vgl. Neunteufel et al., 2017, S. 221
[17] vgl. APCC, 2019, S. 137
[18] vgl. IPCC, 2021, S. 345f.
[19] vgl. IPCC, 2021, S. 1113f., 1118, 1122
[20] vgl. APCC, 2019, S. 32
[21] vgl. ZAMG, 2018 und 2022a
[22] vgl. ZAMG o. J. c
[23] vgl. APCC, 2019, S. 148

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