

Urban Heat Equality

Nature-based solutions to urban heat islands and their impacts on social equality



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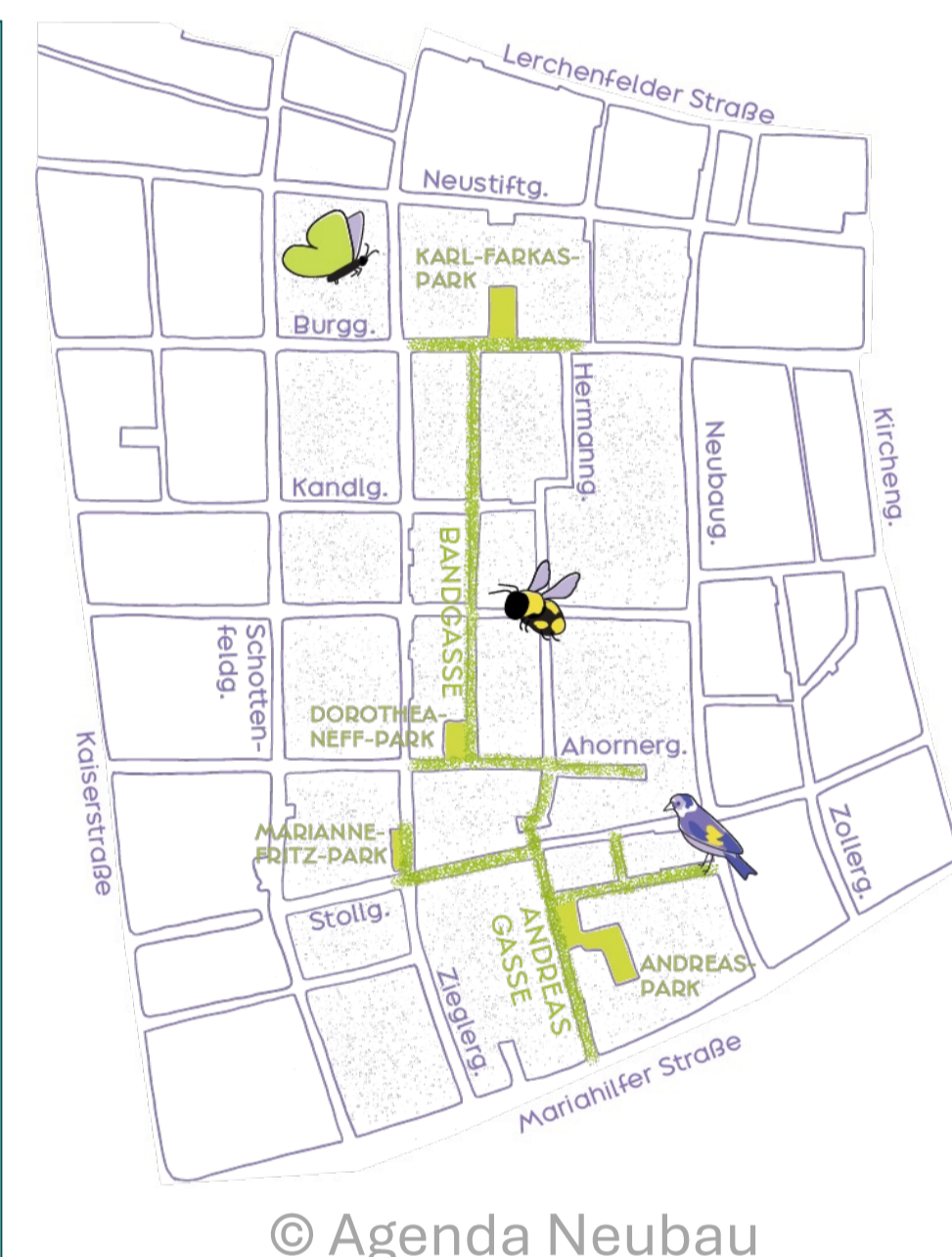


The UrbanHeatEquality project

Marginalized social groups, such as people with a lower socio-economic background, with a migration background, residents with disabilities or elderly residents, are particularly vulnerable to urban heat^{1,2,3,4}. Nature-based Solutions (NbS), such as green spaces, roofs and facades, are a common approach to reduce vulnerability to heat stress. However, NbS planning and implementation processes often ignore questions of social equality⁵ and can even exacerbate social inequalities through green gentrification or other displacement dynamics^{6,7}. Consequently, the question of justice is highly relevant because it reflects how the output and outcome of current adaptation policy processes affect different forms of vulnerability in urban areas. UrbanHeatEquality aims to analyze how the implementation of NbS to urban heat stress affects social equality in Vienna and to assess the consequences for the resilience of urban areas.

Real-world intervention

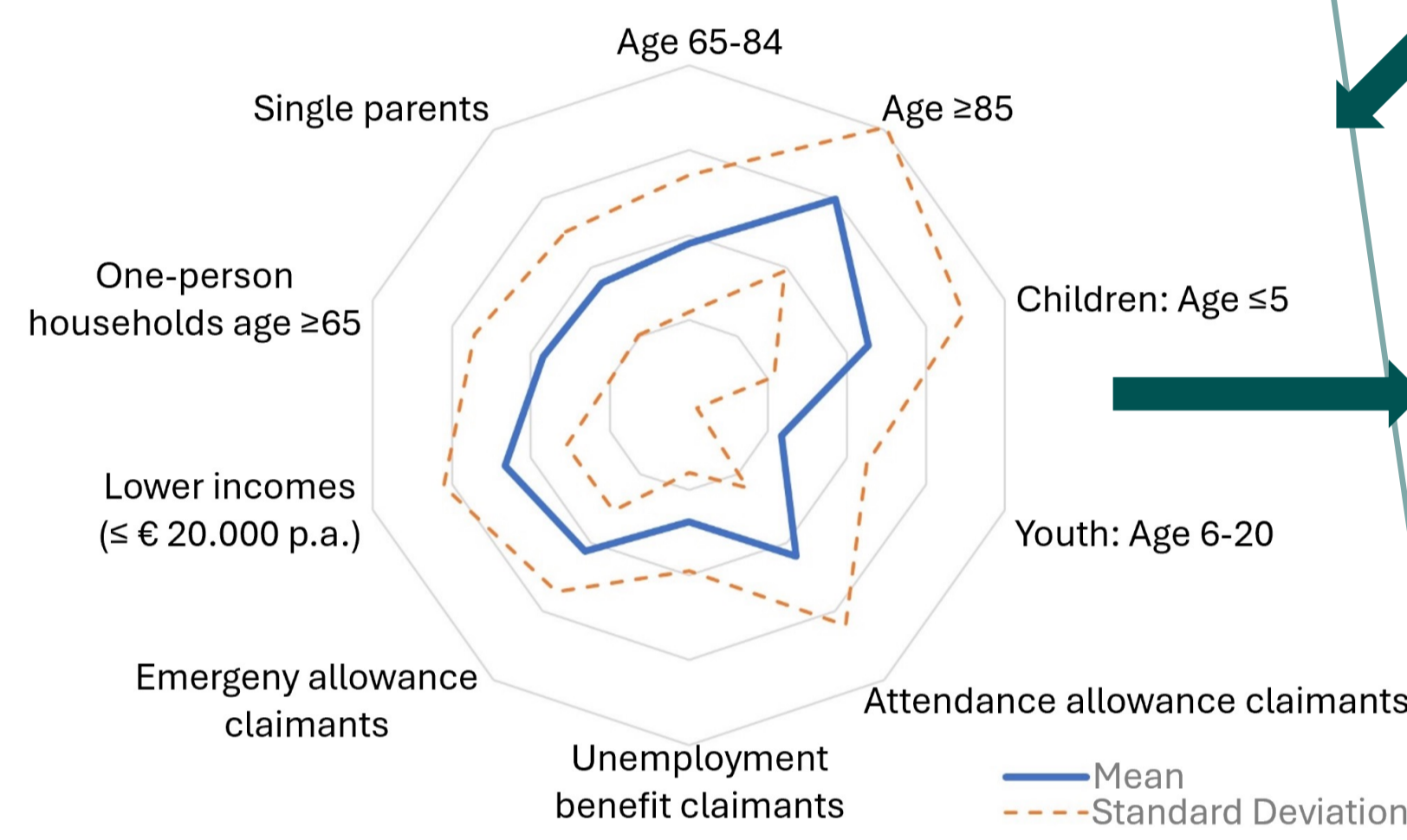
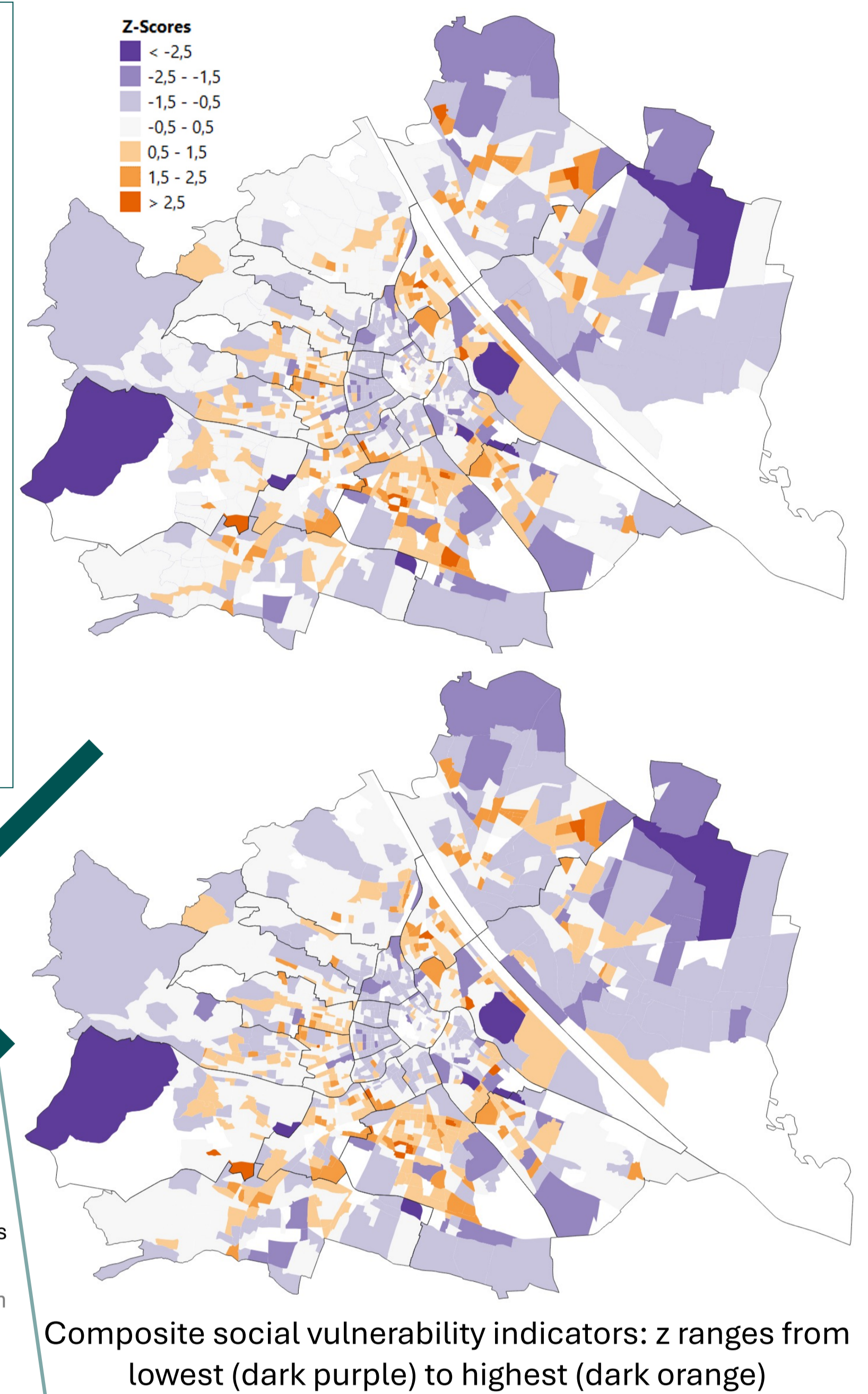
As an intervention to increase procedural justice in NbS planning in Vienna, we will conduct a collaborative planning exercise with heat-vulnerable groups in April 2024. This exercise includes the co-development of measures and recommendations for the project 'Grünes Band' in the 7th municipal district of Vienna.



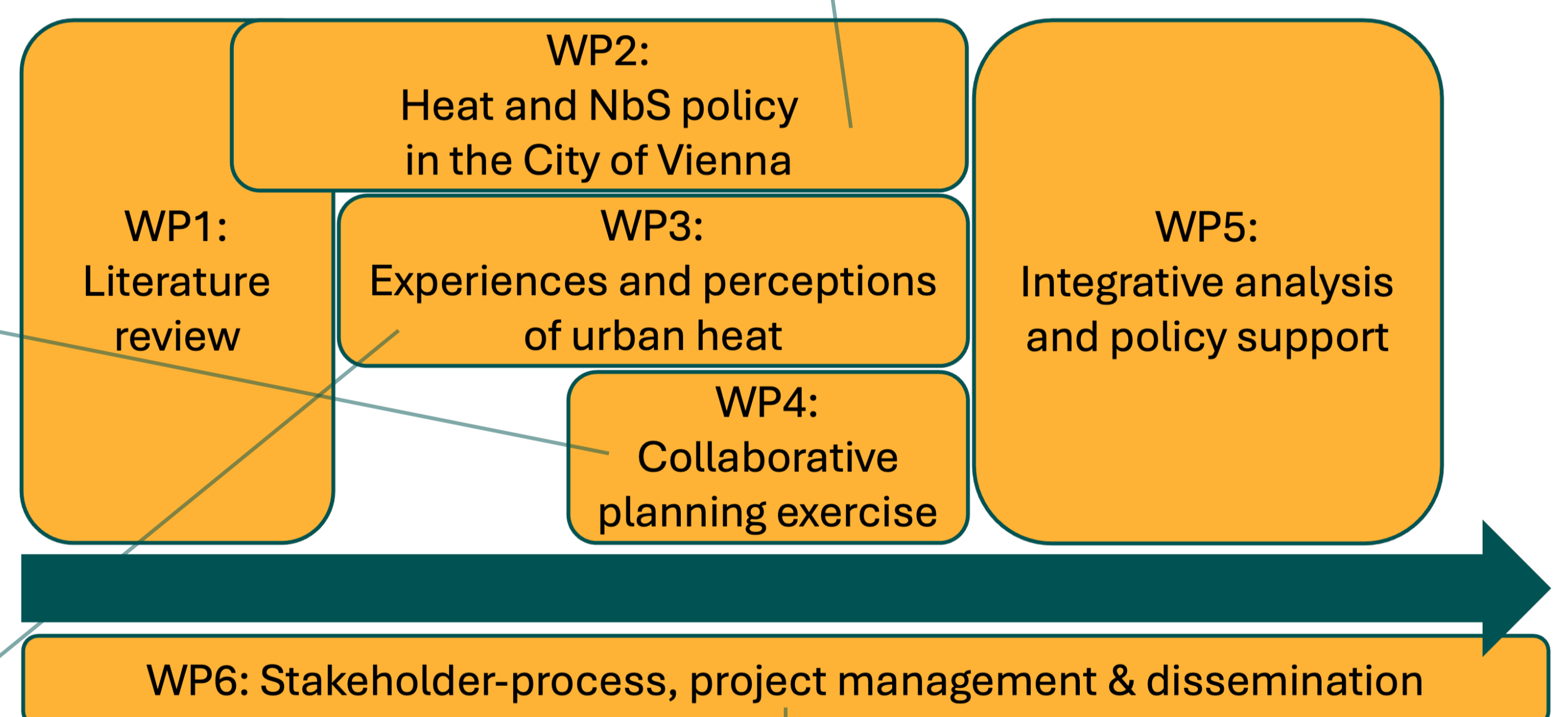
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Mapping vulnerability

We are currently finalizing a heat risk index consisting of 27 indicators for the dimensions hazard, exposure and social vulnerability. Our stakeholder group conducted an initial qualitative expert-based weighting of the social vulnerability indicators, later refined in a quantifiable take-home exercise (below). The map of Vienna displays the minor differences of unweighted and weighted social vulnerability indicators (upper vs. lower map).



Composite social vulnerability indicators: z ranges from lowest (dark purple) to highest (dark orange)



Transdisciplinary approach

Collaboration with a diverse stakeholder group through several interactive workshops is a cornerstone of UrbanHeatEquality. The project's transdisciplinary approach aims to facilitate knowledge integration and to contribute to the quality, legitimacy and acceptance of the results. The group consists of representatives of 18 organizations, including different municipal departments of the City of Vienna, interest groups and civil society actors. Upon their suggestion, we have compiled a repository of knowledge on urban heat, climate change and justice with a focus on Austria on our project website: <https://urbanheat.boku.ac.at/>.



Heat tips from Viennese for Viennese

Recognizing multiple forms of vulnerability and their intersections, in-depth interviews and focus groups with vulnerable residents all over Vienna (above) provided insights into their experiences and perceptions of urban heat. Results are being analyzed along four main categories:

1. Individual adaption strategies to urban heat stress
2. Use and perception of urban areas and infrastructures
3. Vulnerabilities and negative impacts of urban heat
4. Needs and suggestions of vulnerable groups

Based on the participants' suggested adaptations of behavior, daily routines and socio-spatial practices, we are working on a poster series "from Viennese for Viennese" for summer 2024. These posters will be freely available online and distributed to our stakeholder group for use in their organizations.

¹ APCC (2018). Österreichischer Special Report Gesundheit, Demographie und Klimawandel (ASR18). Austrian Panel on Climate Change (APCC), Verlag der ÖAW: Wien, 978-3-7001-8427-0.

² Arnberger, A. et al. (2021). Changes in recreation use in response to urban heat differ between migrant and non-migrant green space users in Vienna, Austria. *Urban Forestry & Urban Greening*, 63, 127193. doi: 10.1016/j.ufug.2021.127193.

³ Wanka, A. et al. (2014). The challenges posed by climate change to successful ageing. *Zeitschrift für Gerontologie und Geriatrie*, 47(6), 468-474. doi: 10.1007/s00391-014-0674-1.

⁴ Wiesböck, L. et al. (2016). Heat Vulnerability, Poverty and Health Inequalities in Urban Migrant Communities: A Pilot Study from Vienna. In: Leal Filho, W., Azeiteiro, U., Alves, F. (Eds.), *Climate Change and Health. Climate Change Management*. Springer, Cham. doi: 10.1007/978-3-319-24660-4_22.

⁵ Kabisch, N. et al. (2016). Nature-based solutions to climate change mitigation and adaptation in urban areas: perspectives on indicators, knowledge gaps, barriers, and opportunities for action. *Ecology and Society*, 21(2). doi: 10.5751/ES-08373-210239.

⁶ Checker, M. (2011). Wiped out by the "greenwave": Environmental gentrification and the paradoxical politics of urban sustainability. *City & Society*, 23(2), 210-229. doi: 10.1111/j.1548-744X.2011.01063.x.

⁷ Meishar, N. (2018). The social aftermaths of landscape architecture: Urban parks and green gentrification. *Landscape Metropolis*, 5(2), 63-76. doi: 10.7480/spool.2018.2.3303.

