

# Open spaces in view of climate change adaptation and mitigation

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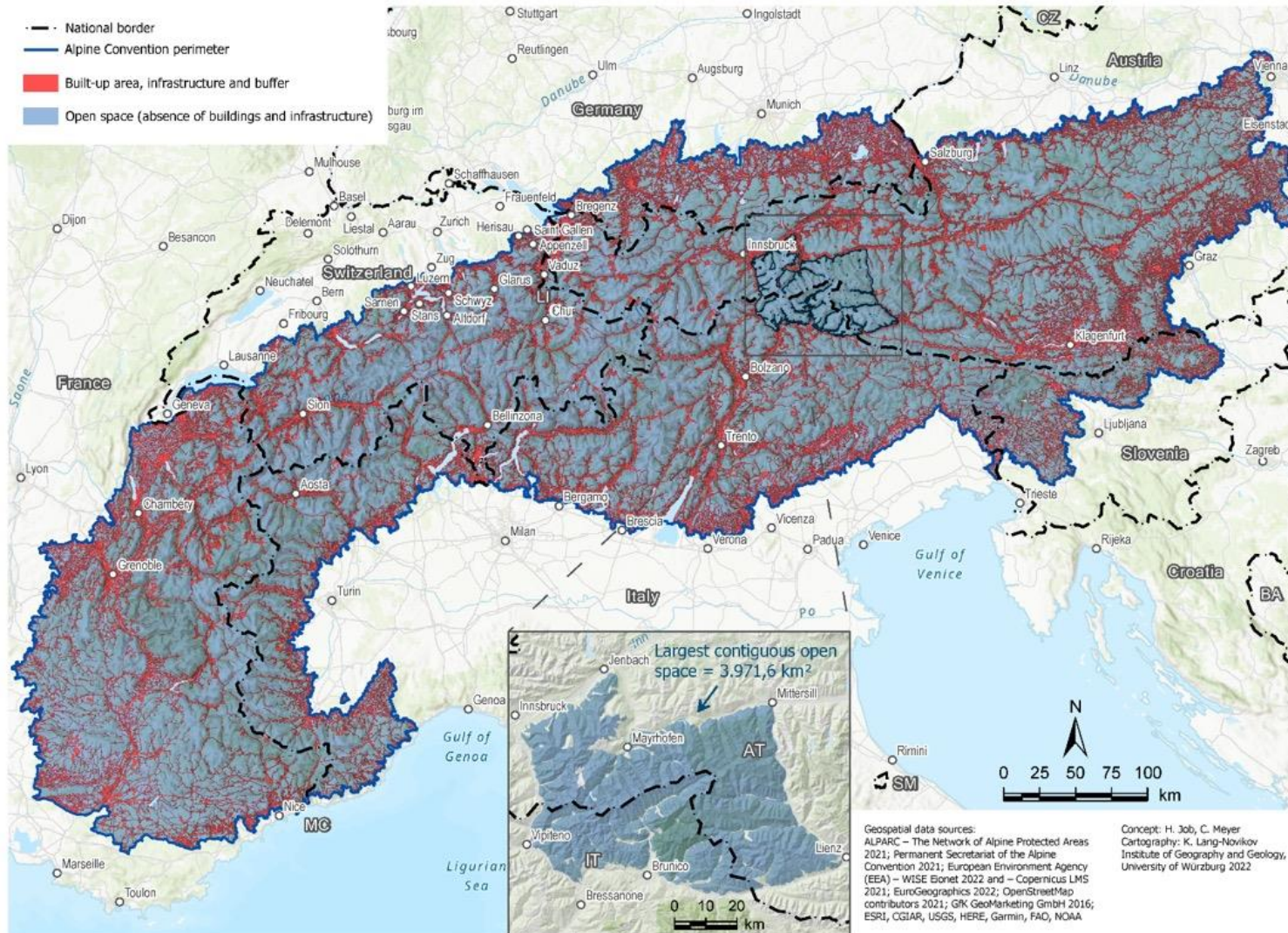
# Recap: OpenSpaceAlps perspective

Tab. 2: Overview of open space functions in relation to ES categories

Open space functions				
		Ecological	Economic	Social functions
Eco- system services (CICES <sup>2</sup> )	<b>Provisioning</b>	(core) habitat provision ecological connectivity (habitat links) soil formation	agricultural use forestry use biomass production	food production/supply (raw material supply)
	<b>Regulation &amp; maintenance</b>	ecological regulation (e.g. water, nutrient flows)	freshwater purification	natural hazard prevention (e.g. flood retention) noise emission control
	<b>Cultural</b>	natural monuments	nature-based tourism	outdoor recreation unique landscapes (regional identity)
Cross-cutting functions				
climate change mitigation (e.g. terrestrial carbon storage) climate change adaptation (e.g. flood retention, cold air flow, corridors for species migration)				

Source: Meyer et al. 2022

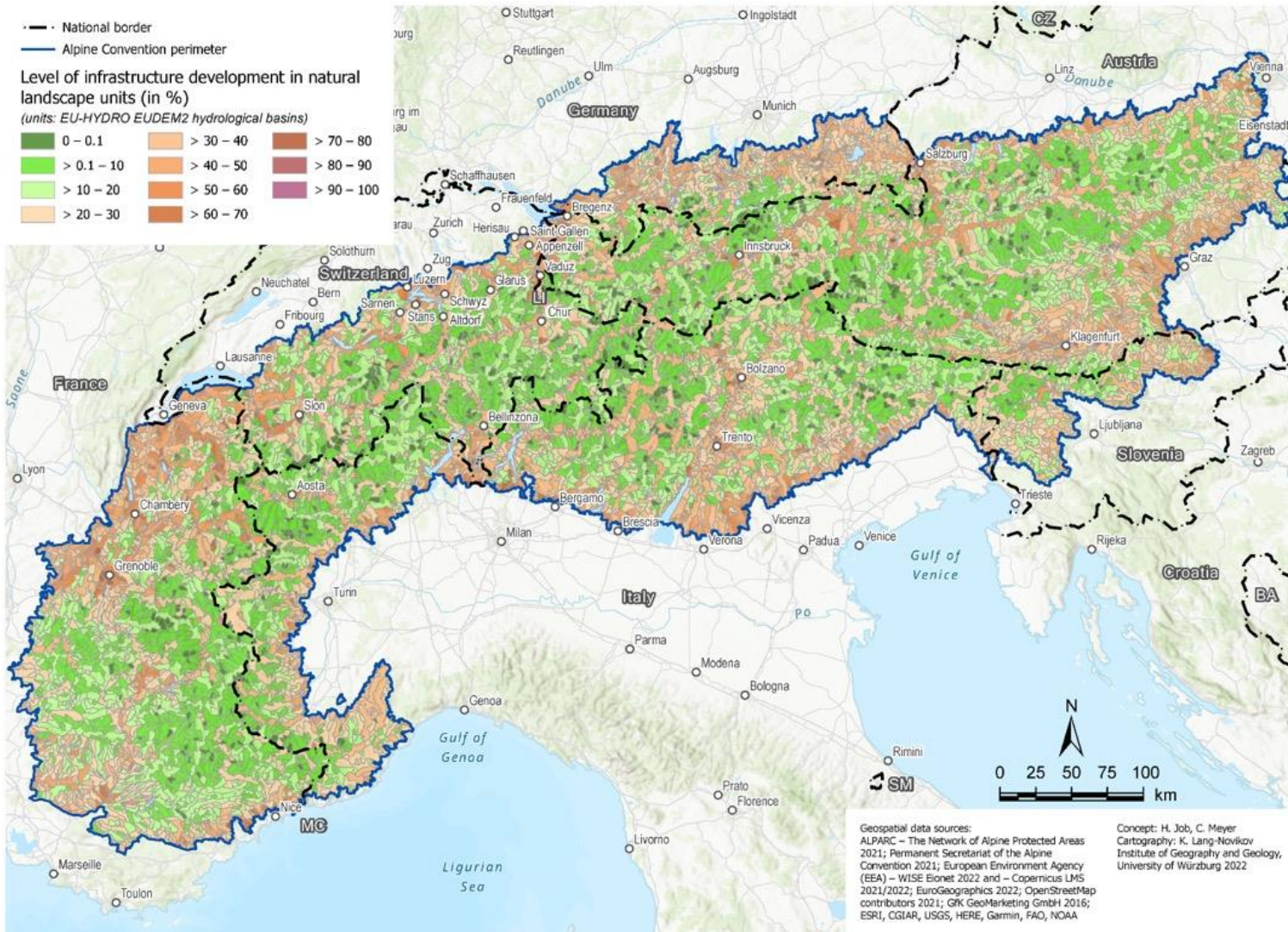
# Recap: OpenSpaceAlps perspective



Source: Job et al. 2022



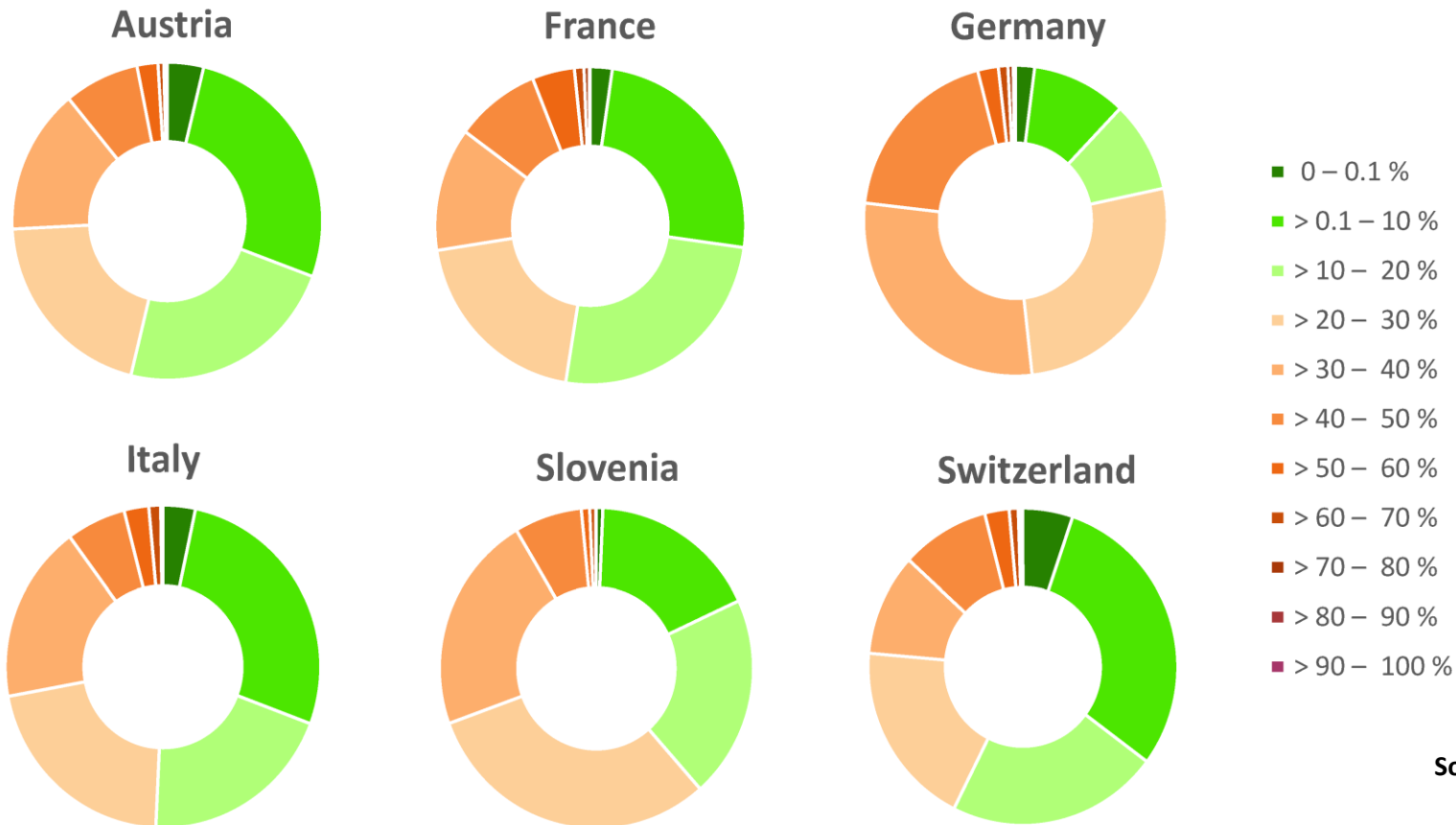
# Recap: OpenSpaceAlps perspective



Source: Job et al. 2022

# Recap: OpenSpaceAlps perspective

Shares of selected countries (Alpine Convention Area):



Source: Job et al. 2022

# Looking ahead: future cooperation & research topics



# Regional coordination of renewable energy installations



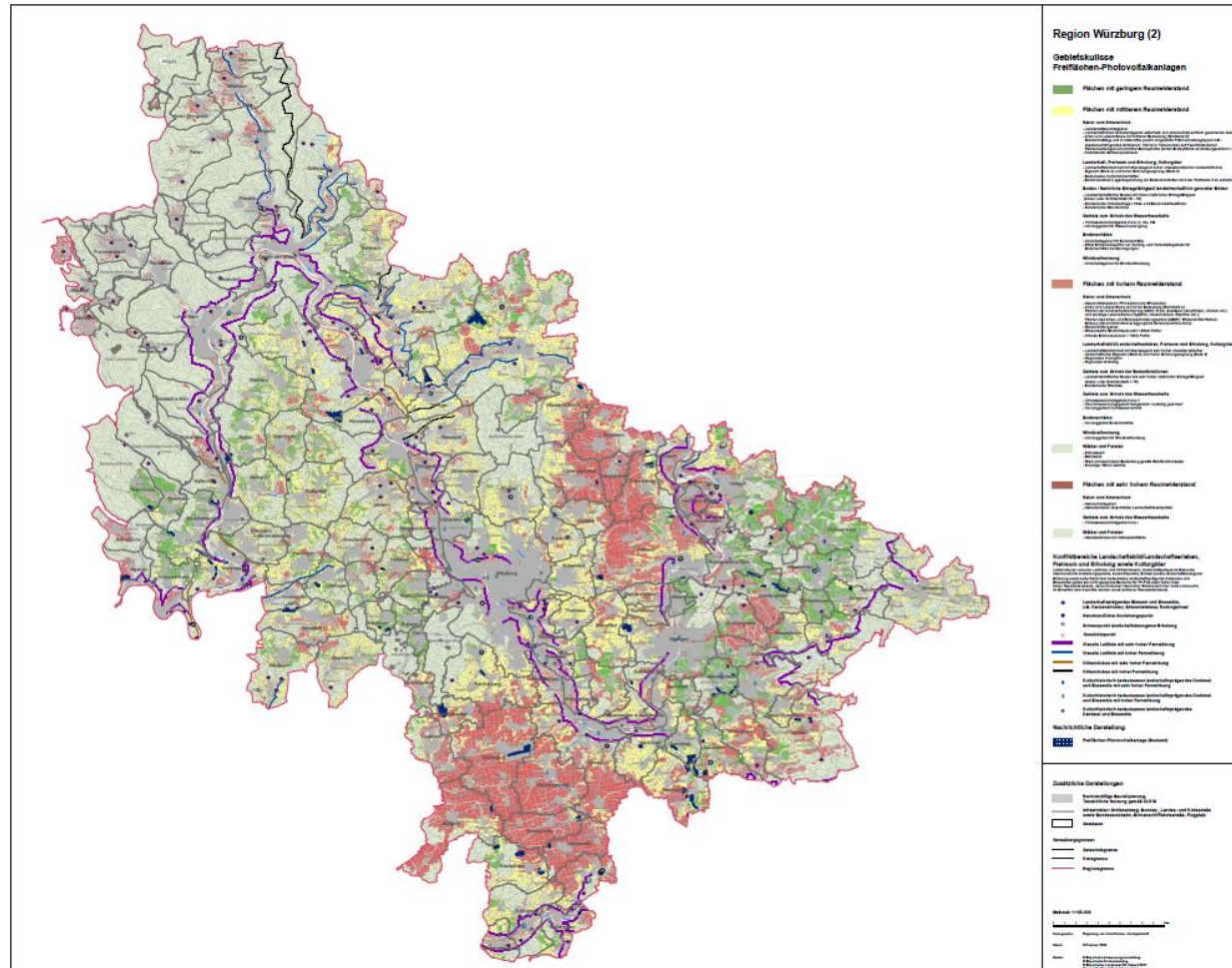
# Regional coordination of renewable energy installations



Source: Regierung von  
Unterfranken 2022

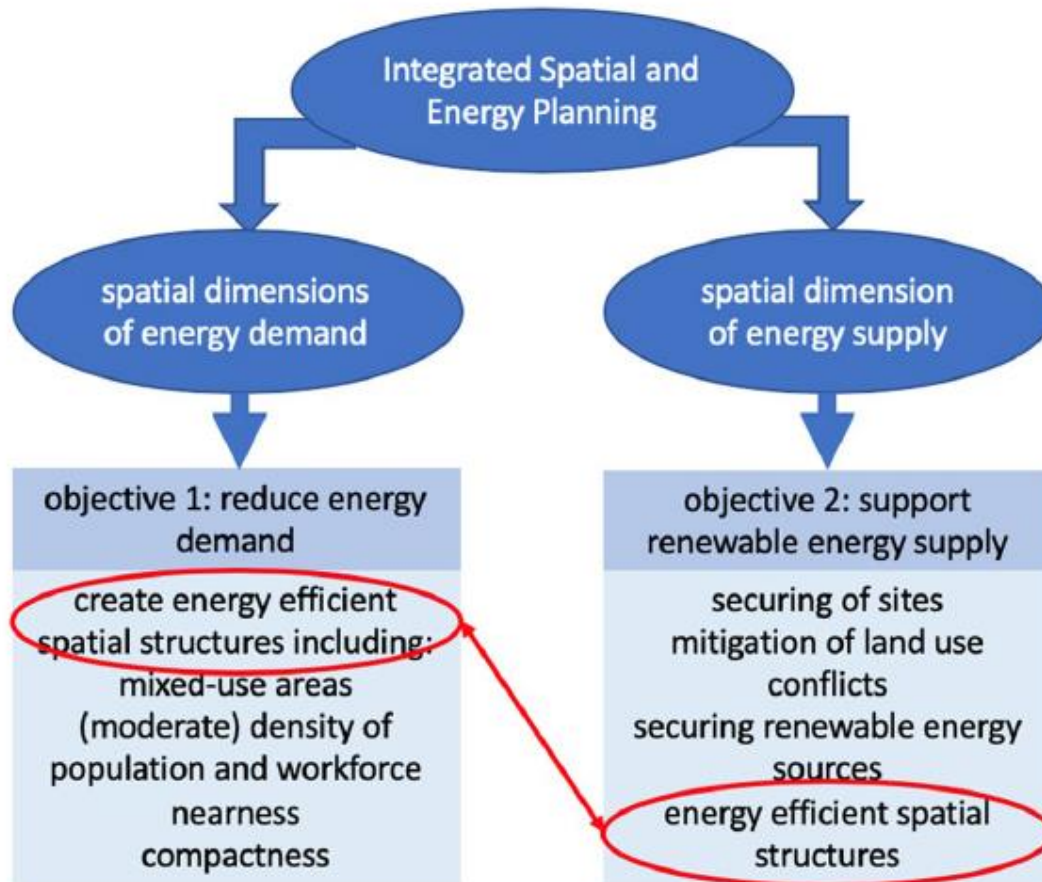


# Regional coordination of renewable energy installations



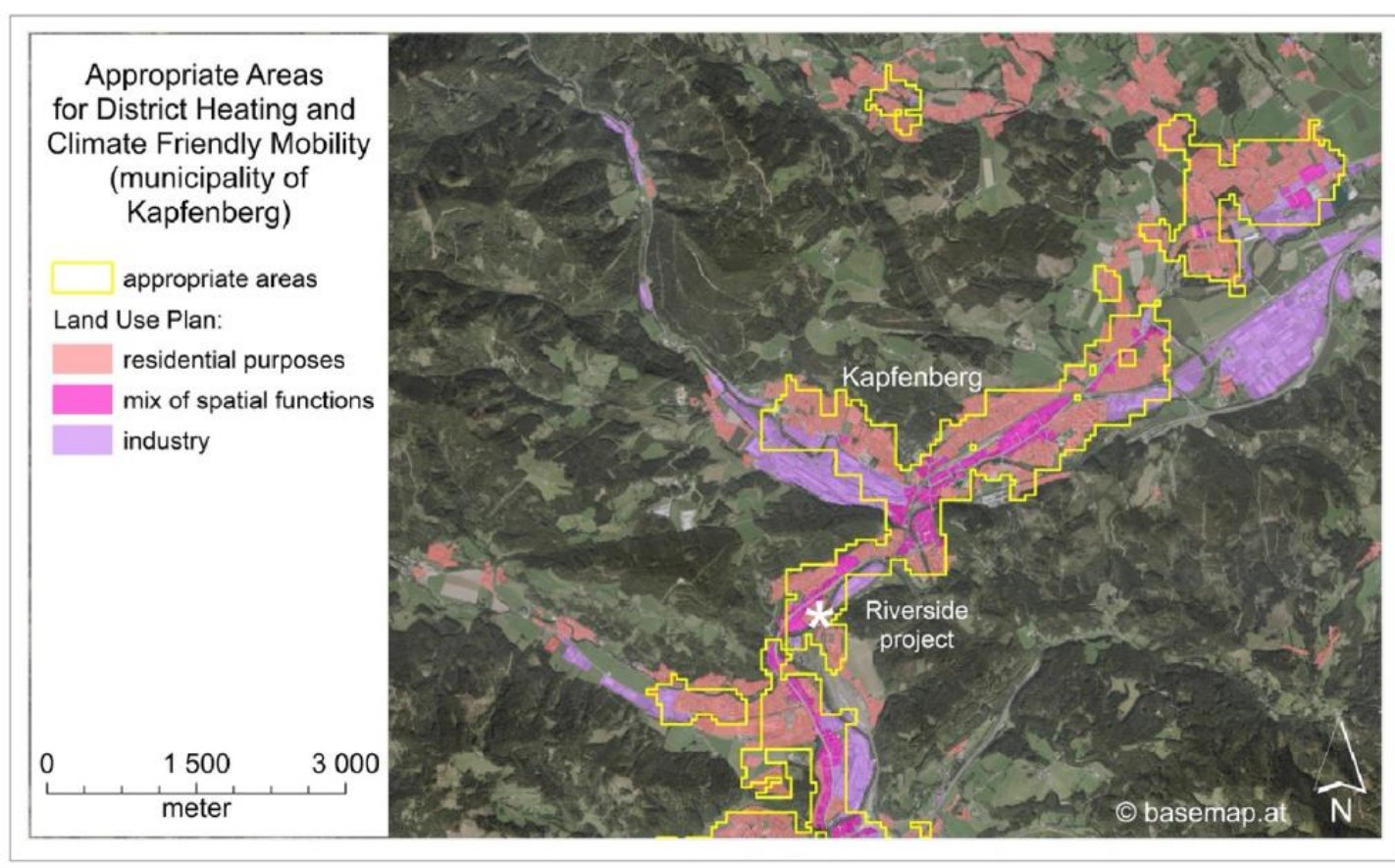
Source: Regierung von Unterfranken 2022

# Integrated spatial and energy planning



Source: Stoeglehner  
2020

# Integrated spatial and energy planning



Source: Stoeglehner  
& Abart-Heriszt 2022



# Green Infrastructure: Planning Principles

- > **Connectivity**
- > **Multifunctionality**
- > Multiscale
- > Integration
- > Diversity
- > Applicability
- > Governance
- > Continuity

Source: Monteiro et al. 2020

# Green Infrastructure Planning: Implementation

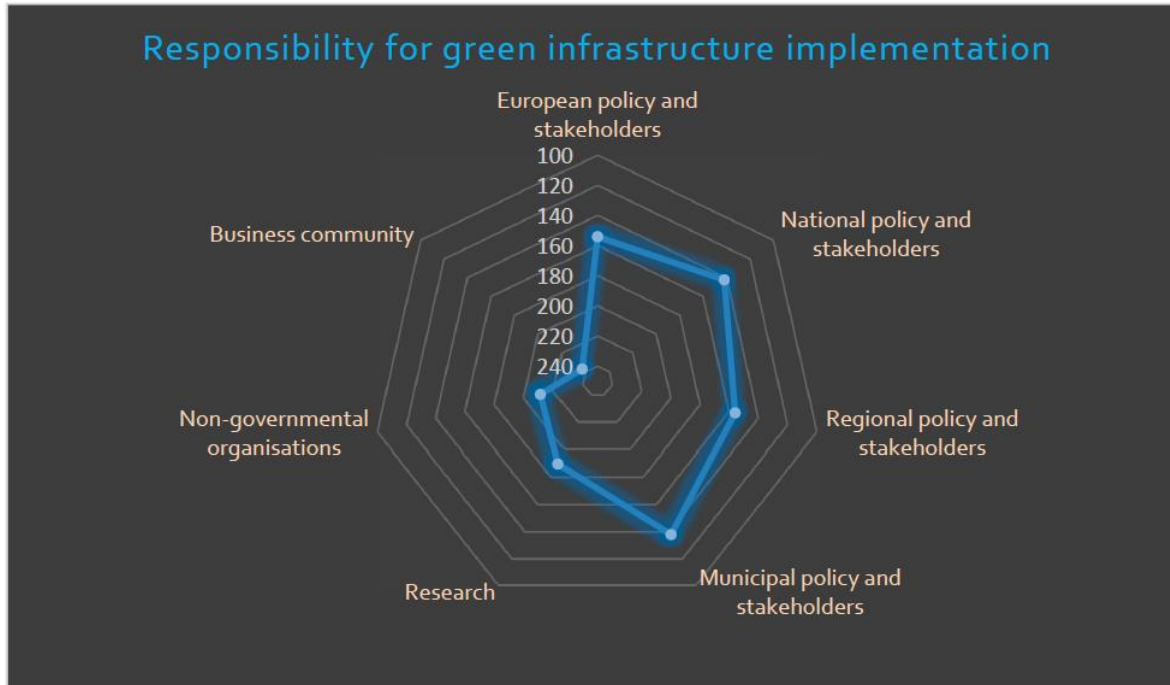
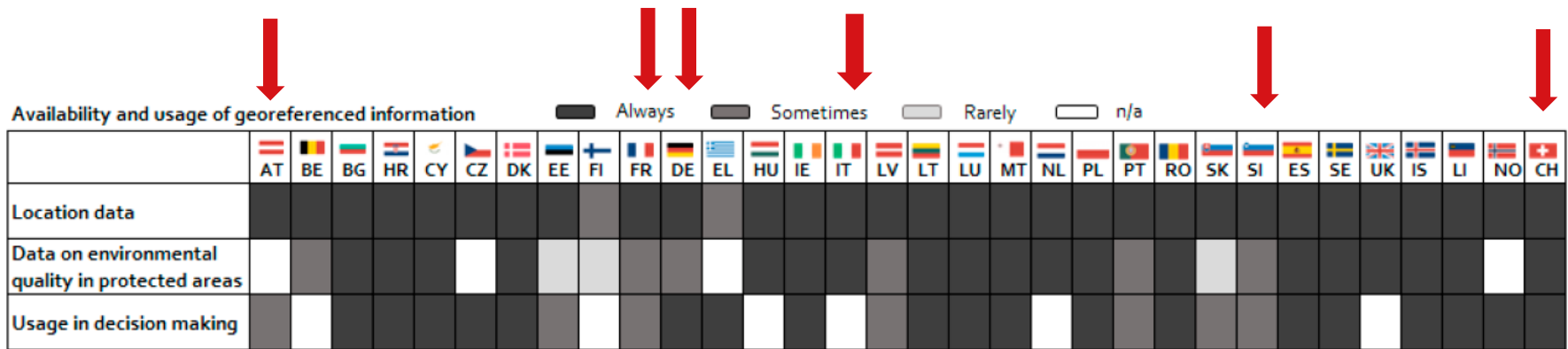


Figure 3. Groups of actors responsible for implementing green infrastructure in the 32 European countries (EU28 and Iceland, Liechtenstein, Norway and Switzerland) based on a summary of 41 online survey responses. The actors/institutions with the lowest score were considered to have the greatest responsibility.

Source: Slätmo et al. 2019

# Green Infrastructure Planning: Implementation

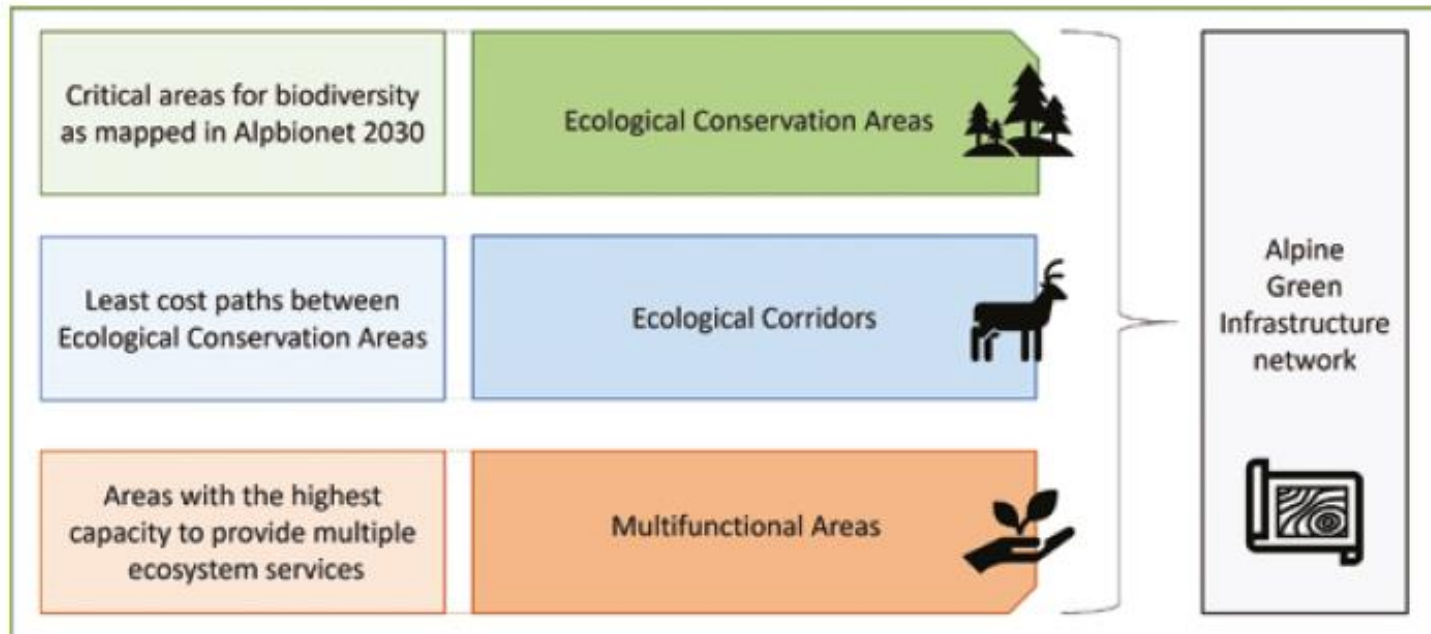


**Figure 5.** Availability and usage of georeferenced information on location and environmental quality in 32 European countries (EU28 and Iceland, Liechtenstein, Norway and Switzerland).

Source: Slätmo et al. 2019

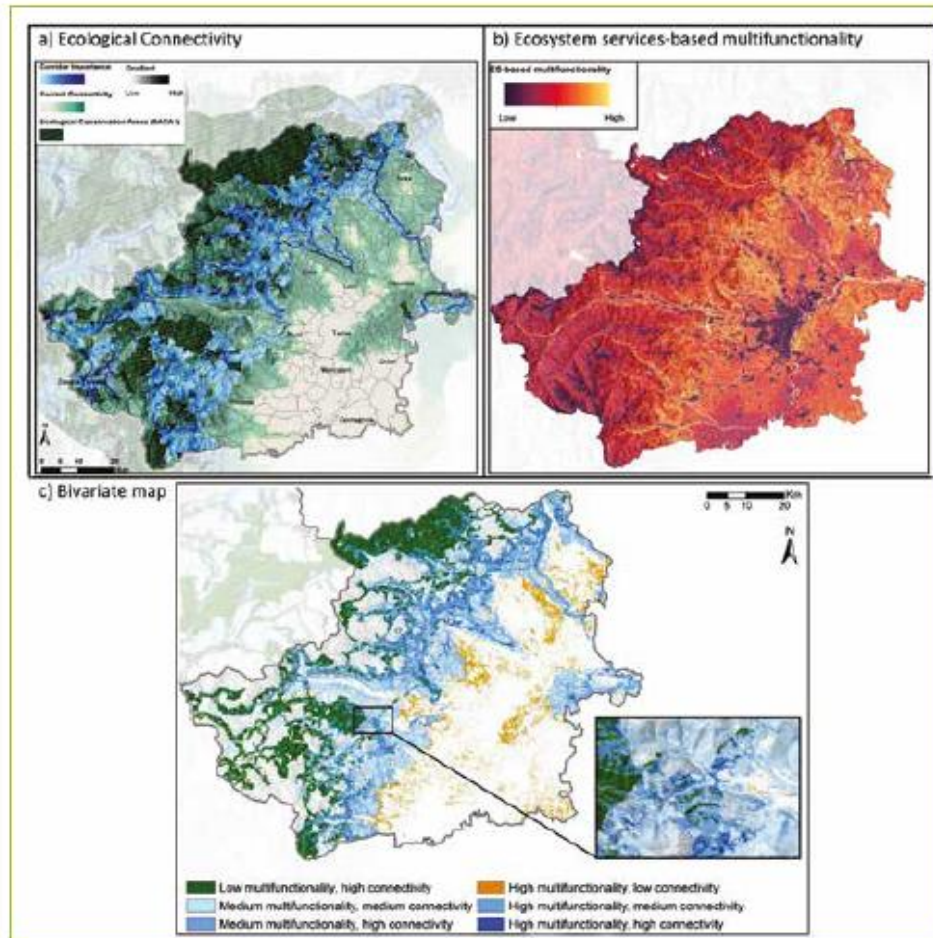


# Green Infrastructure Planning: Fostering GI multifunctionality and connectivity



Source: Giombini et al. 2022

# Green Infrastructure Planning: Fostering GI multifunctionality and connectivity



Source: Giombini et al. 2022

# Incorporating ecosystem services in spatial planning

## 10 THESES on ecosystem services and spatial planning

### BENEFIT



1 Use new narratives to foster change in social awareness

2 Make better informed decisions through integrative approaches



3 Enhance participation in decisions on the use of natural resources

### OPERATIONAL OPTIONS

4 Use and further develop existing data and methods

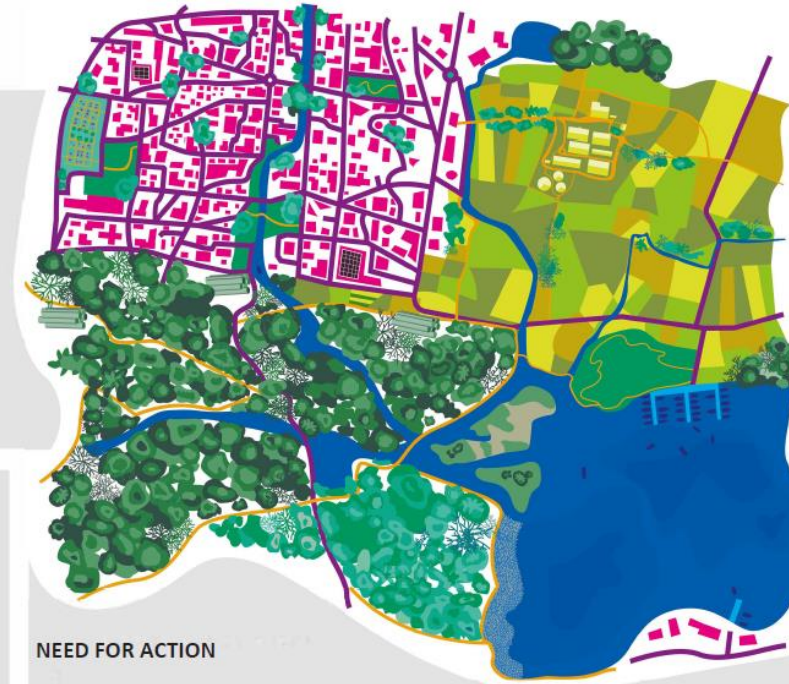


5 Use and expand links to formal planning instruments

6 Inspire informal planning instruments through new approaches



7 Promote participation in planning processes through new perspectives



### NEED FOR ACTION

### OUTLOOK &



8 Advance comparative and application-oriented research



9 Empower planning authorities to consider ecosystem services



10 Support transformative change

Source: ARL 2022

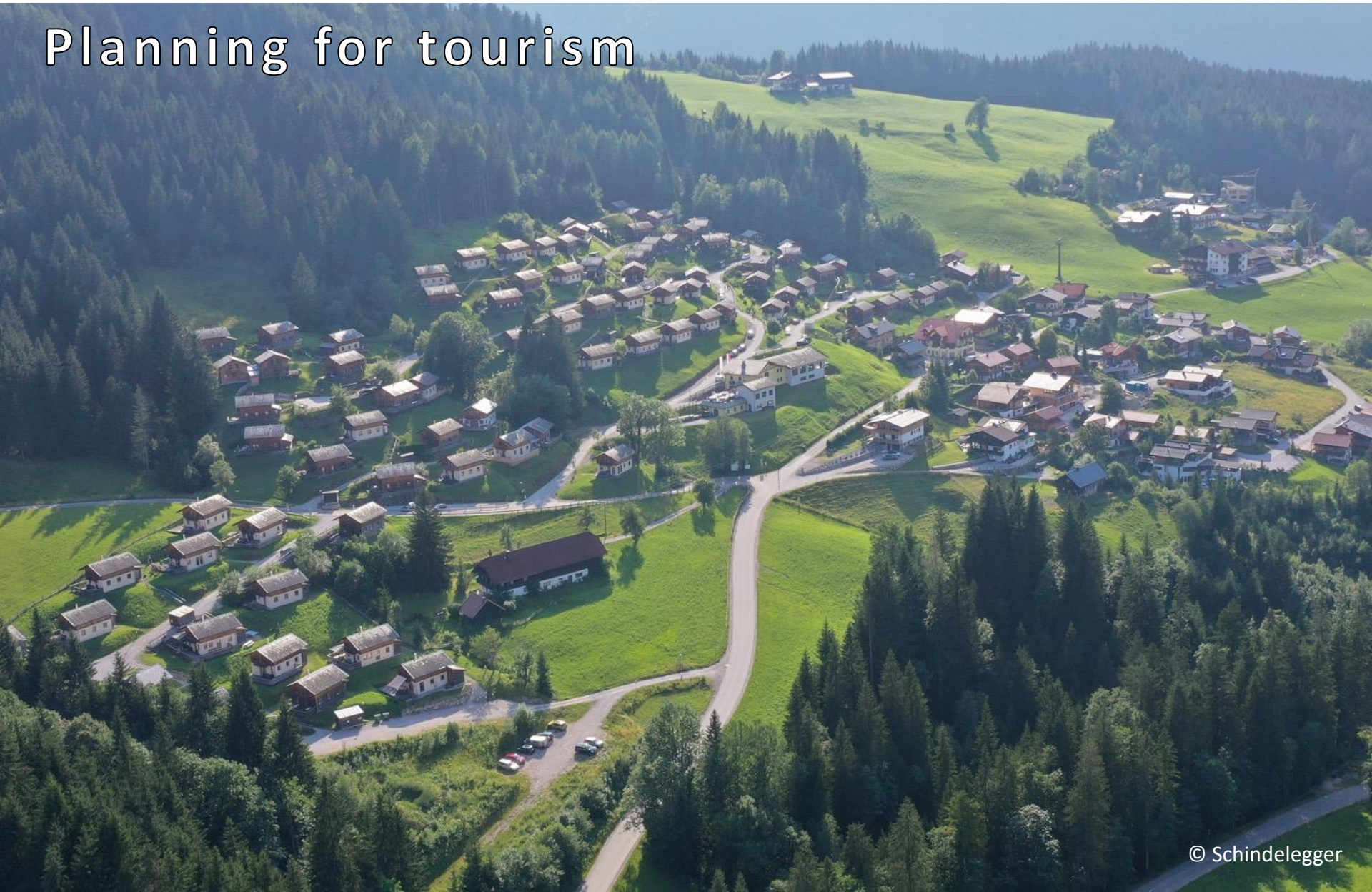


# Planning for housing





# Planning for tourism





# Planning for commerce and production





# Planning for energy transition





# Change understanding of spatial planning?

**protection forest**

**agricultural areas**  
*soil functions, production,  
water retention etc.*

**alluvial forest**  
*nature-based solution*

# References

ARL – Academy for Territorial Development in the Leibniz Association (Ed.) (2022): Thematic collection: Securing open space and ecosystem protection. <https://www.arl-international.com/knowledge/thematic-collections/securing-open-space-and-ecosystem-protection> (02.11.2022)

Giombini, V.; Simion, H.; Marsoner, T.; Egarter Vigl, L. (2022): A Framework for indentifying and mapping Green Infrastructure Networks in the Alps. In: Città metropolitana di Milano, Fondazione Lombardia per l’Ambiente (Ed.): Shaping a sustainable future with Green Infrastructure. Milano, 25-38.

Job, H.; Meyer, C.; Coronado, O.; Koblar, S.; Laner, P.; Omizzolo, A.; Plassmann, G.; Riedler, W.; Vesely, P.; Schindelegger, A. (2022): Open Spaces in the European Alps—GIS-Based Analysis and Implications for Spatial Planning from a Transnational Perspective. *Land* 11, 1605.

Monteiro, R.; Ferreira, J.; Antunes, P. (2020): Green Infrastructure Planning Principles: An Integrated Literature Review. *Land* 9, 525.

Meyer, C., Job, H., Laner, P. et. al. (2022): OpenSpaceAlps Planning Handbook: Perspectives for consistent safeguarding of open spaces in the Alpine region. Interreg Alpine Space project OpenSpaceAlps (translated in DE, FR, IT and SLO).

Regierung von Unterfranken (Ed.) (2022): Steuerung von Photovoltaikanlagen auf Freiflächen in Unterfranken. Planungshilfe für Städte, Gemeinden und Projektträger. Würzburg.

Slätmo, E.; Nilsson, K.; Turunen, E. (2019): Implementing Green Infrastructure in Spatial Planning in Europe. *Land* 8, 62.

Stoeglehner, G. (2020): Integrated spatial and energy planning: a means to reach sustainable development goals. *Evolutionary and Institutional Economics Review* 17: 473–486.

Stoeglehner, G.; Abart-Heriszt, I. (2022): Integrated spatial and energy planning in Styria – A role model for local and regional energy transition and climate protection policies. *Renewable and Sustainable Energy Reviews* 165, 112587.



# Thank you for your attention!

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