



EUSALP EU STRATEGY FOR THE ALPINE REGION

www.alpine-region.eu

The big picture

Energy data trends in the EUSALP

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80 million people, 7 countries, 48 regions,
mountains and plains addressing together
common challenges and opportunities



This project is co-financed by the European Union via Interreg Alpine Space



eurac research

Institute for Renewable Energy



Credits: BLS – NOI TechPark Bolzano

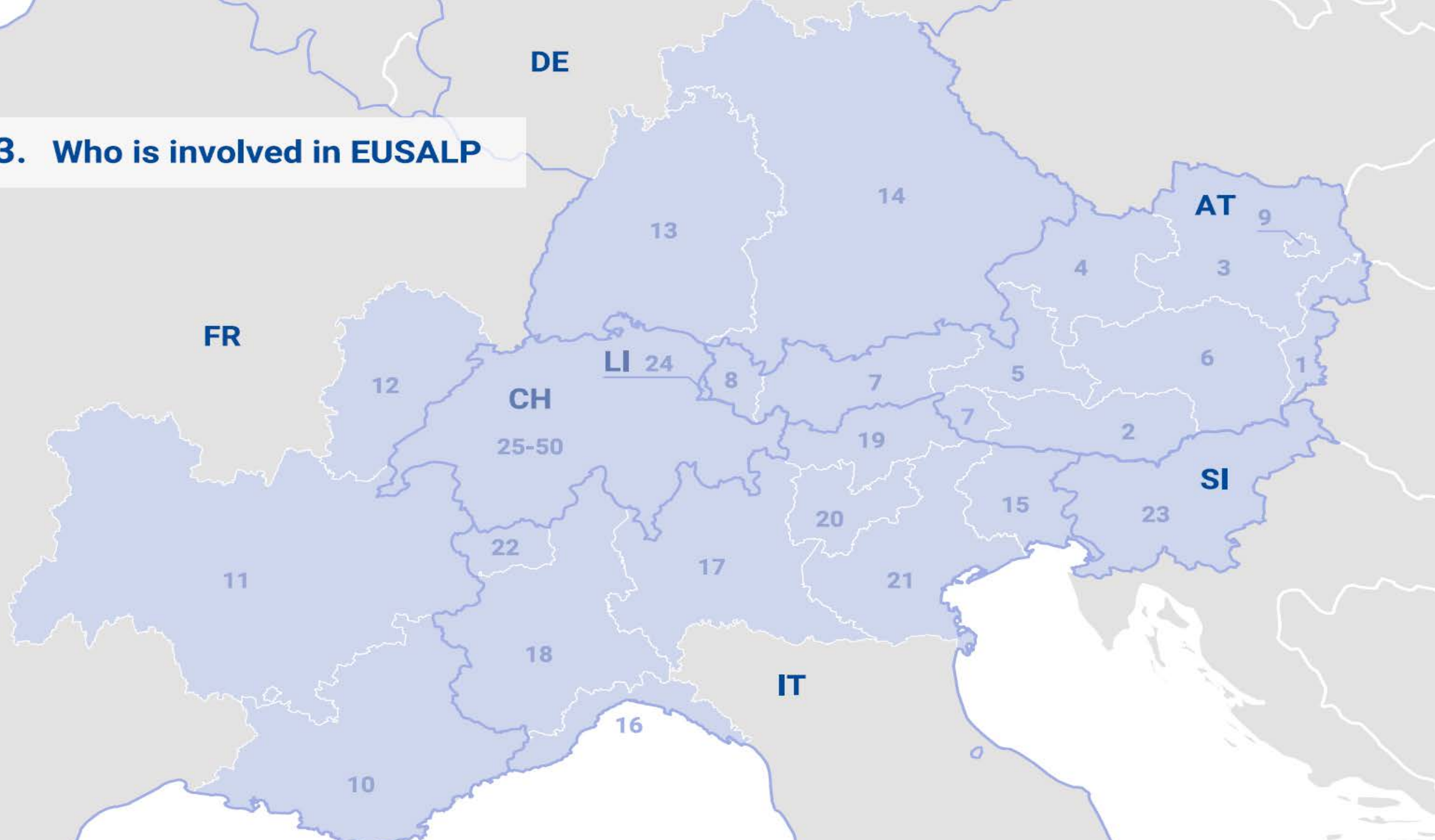


alperia

*wir sind
südtiroler
energie*

*siamo
l'energia
dell'alto adige*

3. Who is involved in EUSALP





Val Martello, Southtyrol – [Alperia.eu](https://alperia.eu)



“... make the EUSALP territory a model region for energy efficiency and renewable energy ...”

Mission statement of EUSALP Action Group 9

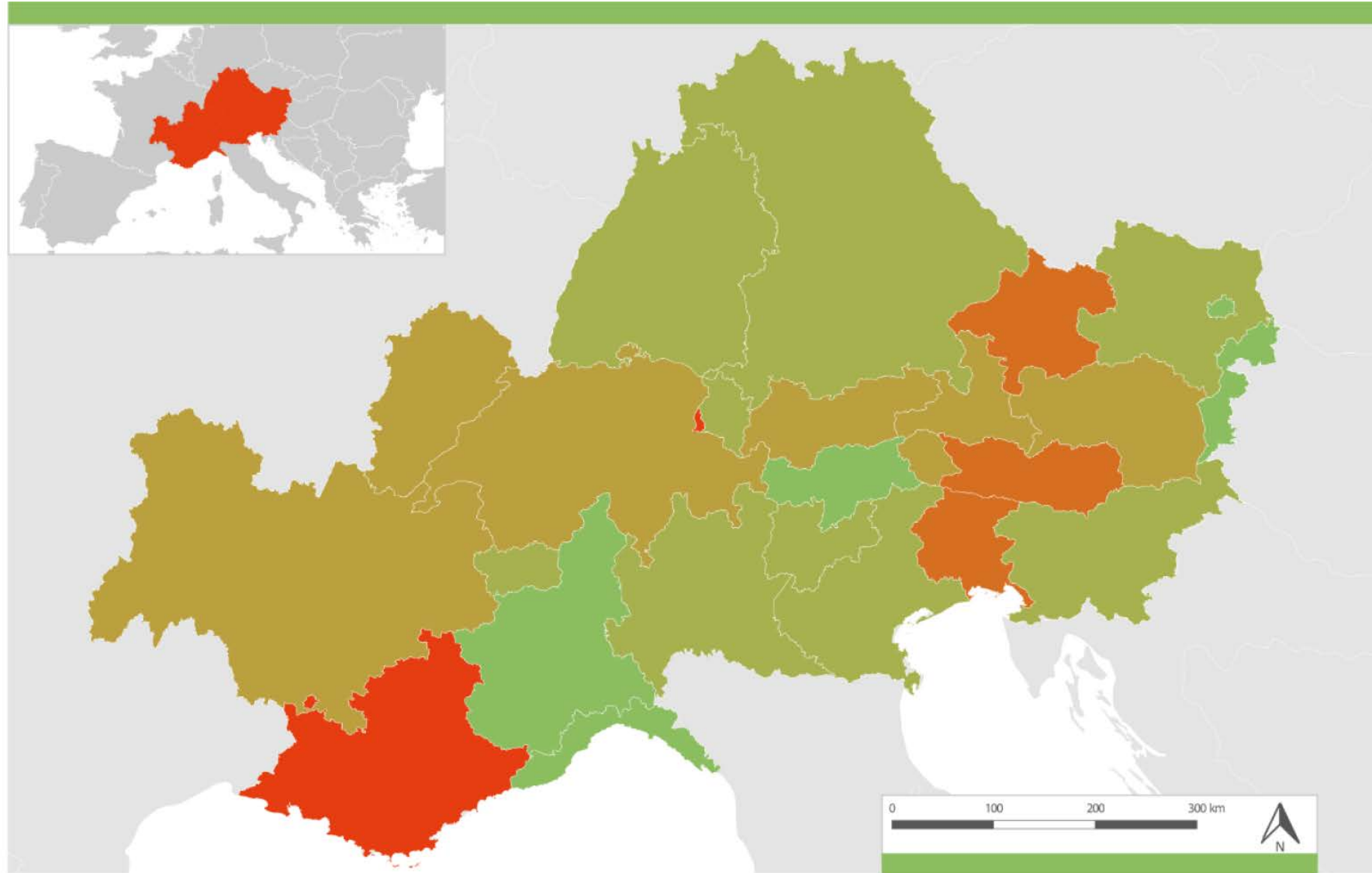
But where are we now?

Electricity consumption per capita ...

Legend

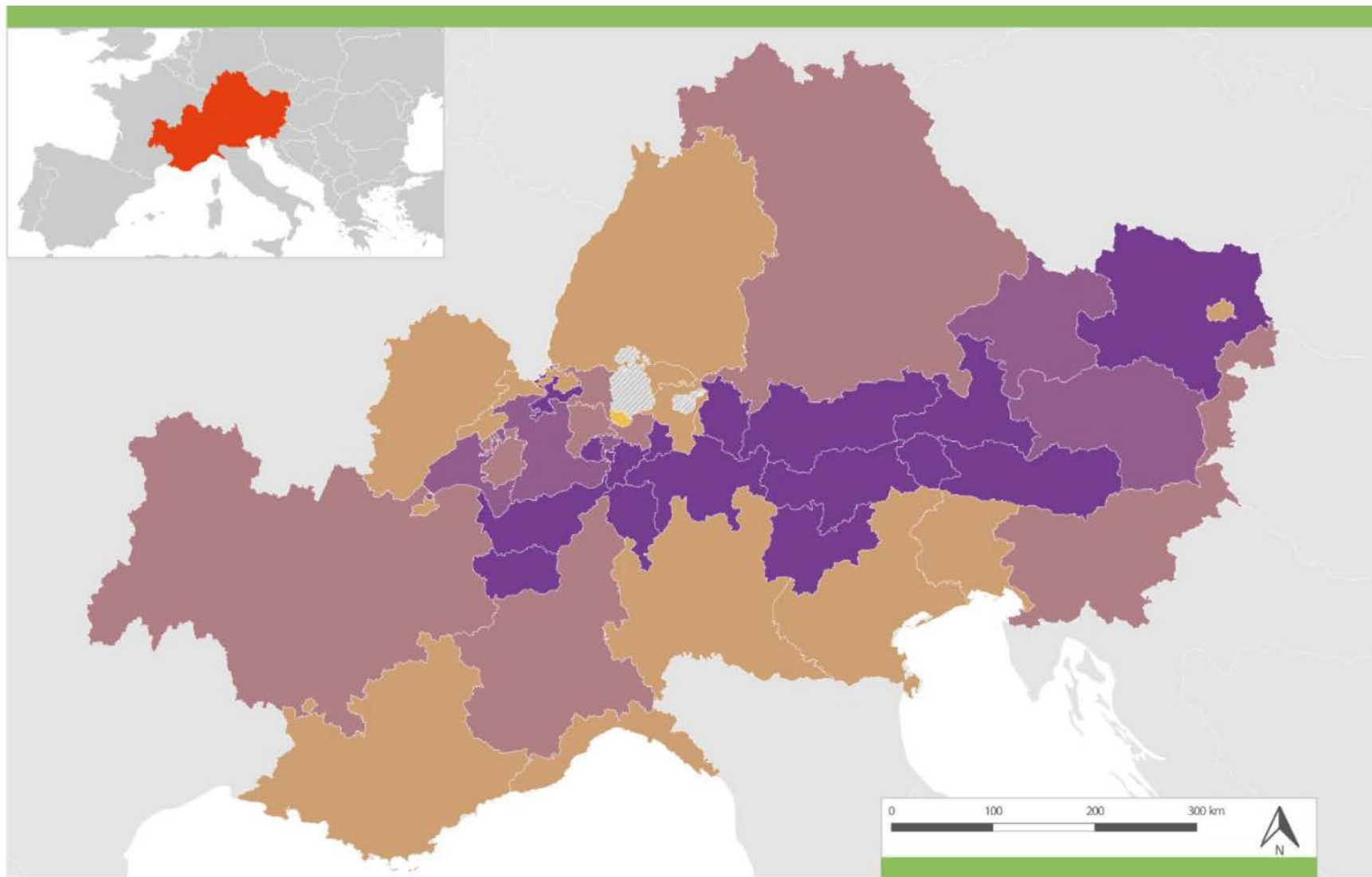
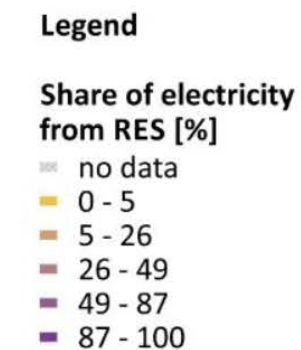
Annual electricity
consumption
per capita [MWh]

- 0 - 6
- 6 - 7
- 7 - 8
- 8 - 10
- 10 - 12.9



Source: Eurac Research

Share of renewable electricity ...



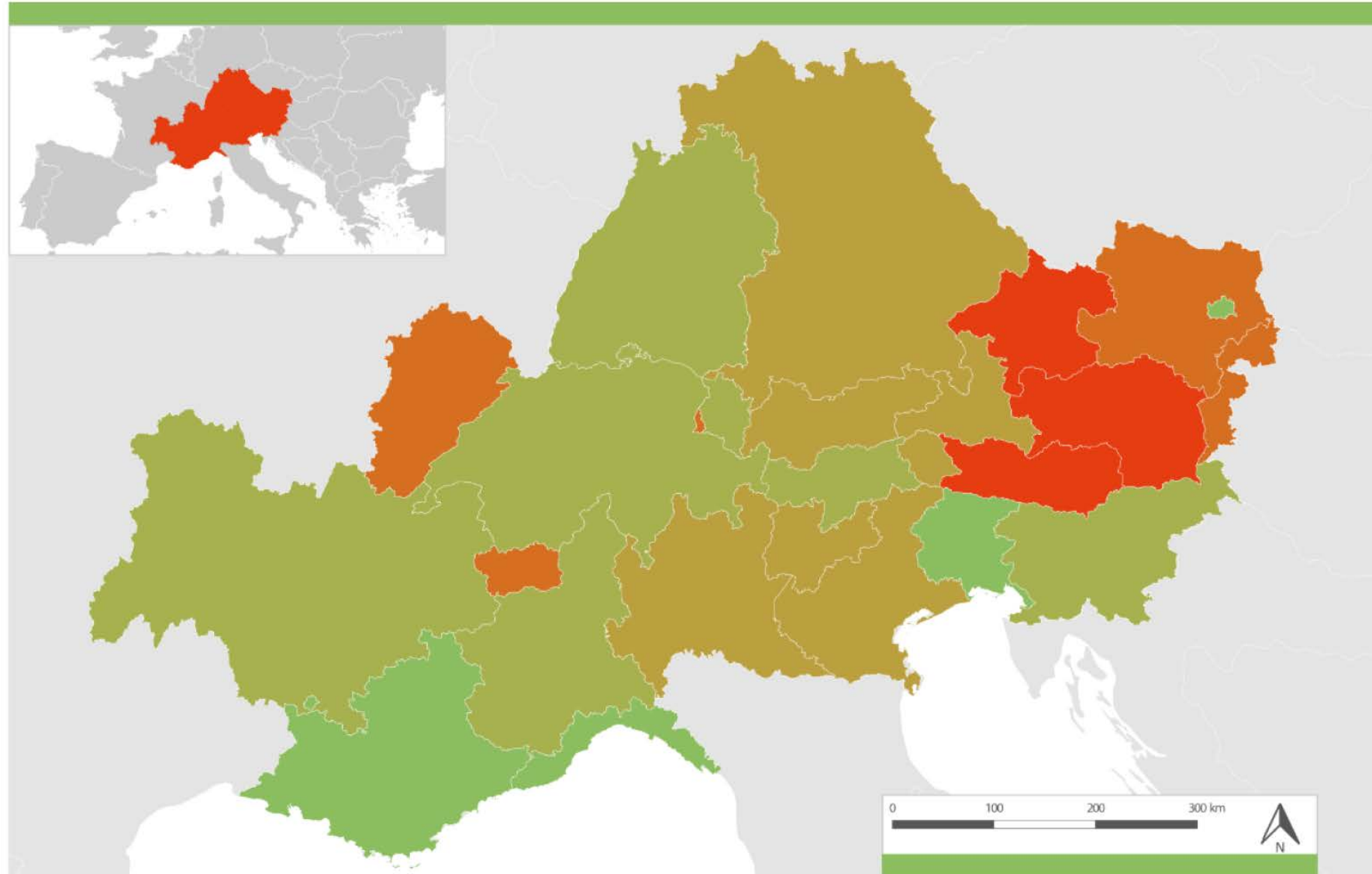
Source: Eurac Research

Heating consumption per capita ...

Legend

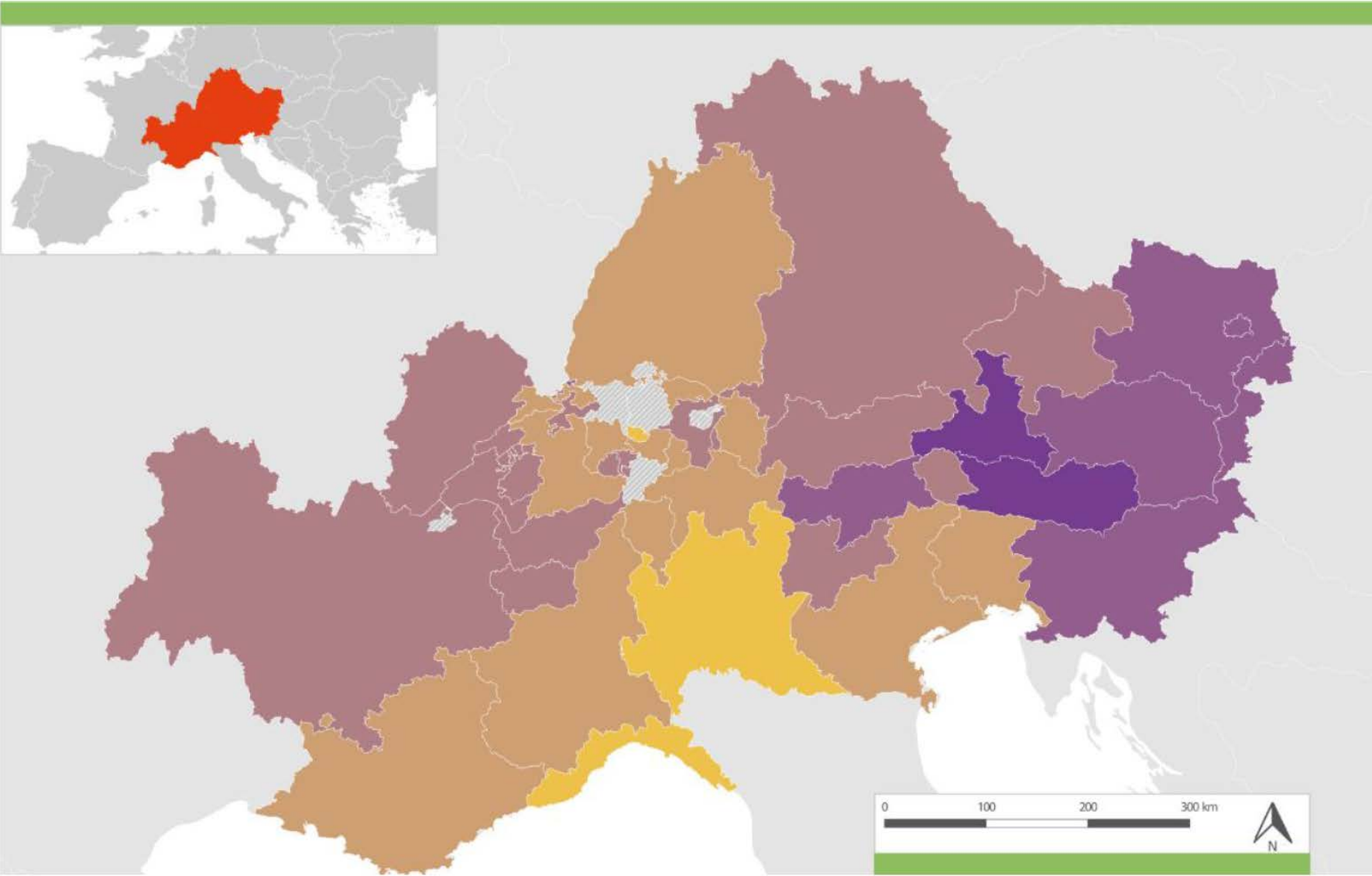
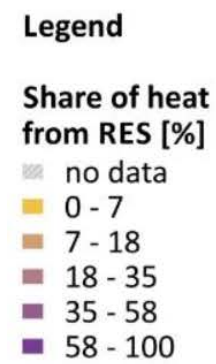
Annual heat
consumption
per capita [MWh]

- 0 - 10
- 10 - 12.5
- 12.5 - 15
- 15 - 20
- 20 - 21.5



Source: Eurac Research

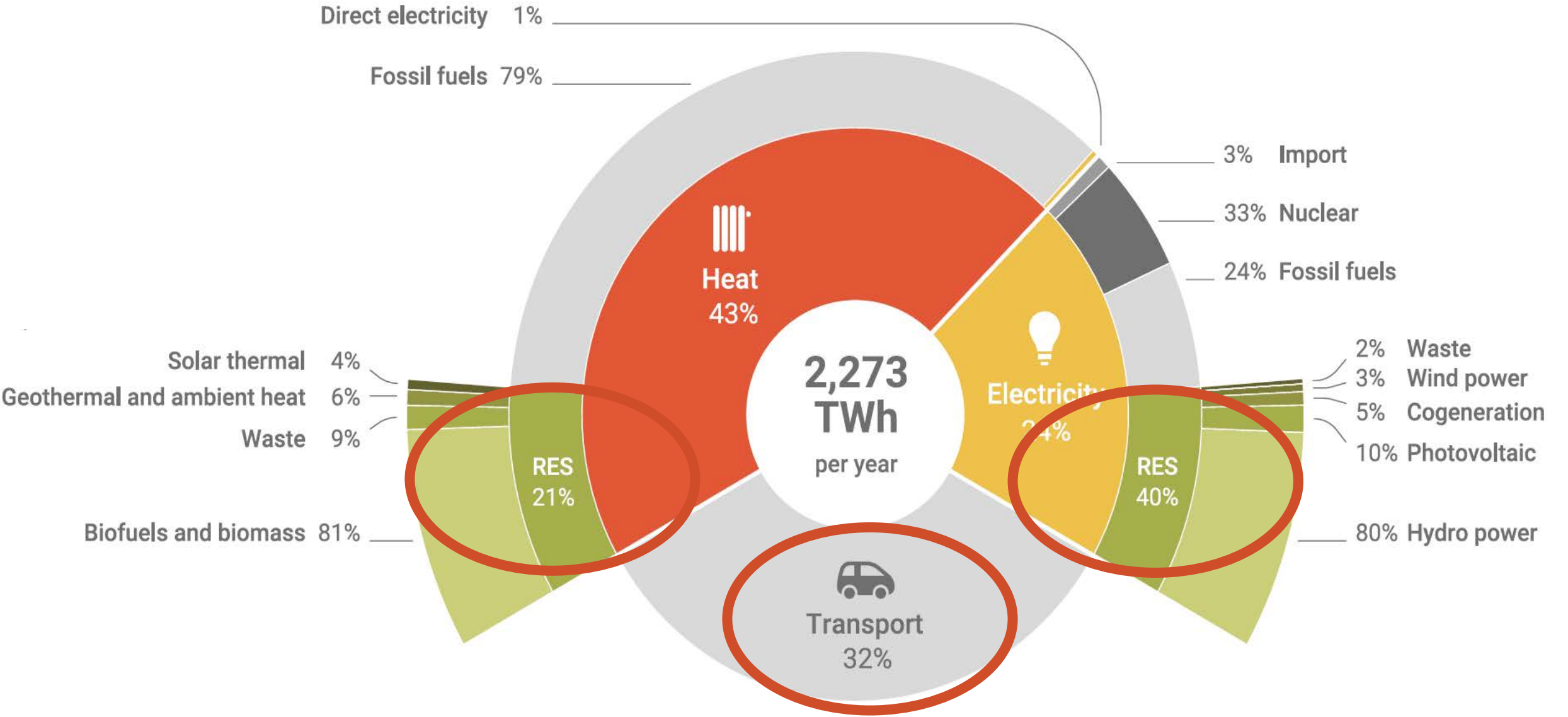
Share of renewable heat ...



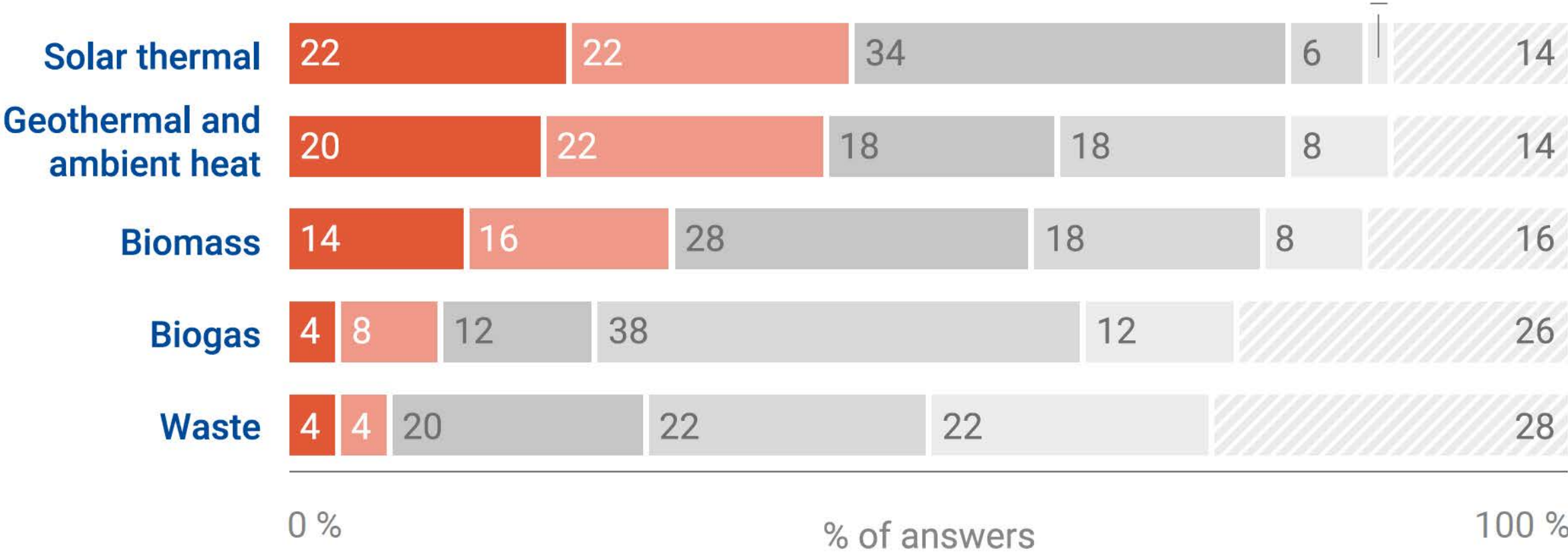
source: Eurac Research

Figure 10. Share of heat from renewable energy sources.

The big picture ...



Survey - estimation of potential of heating technologies ...

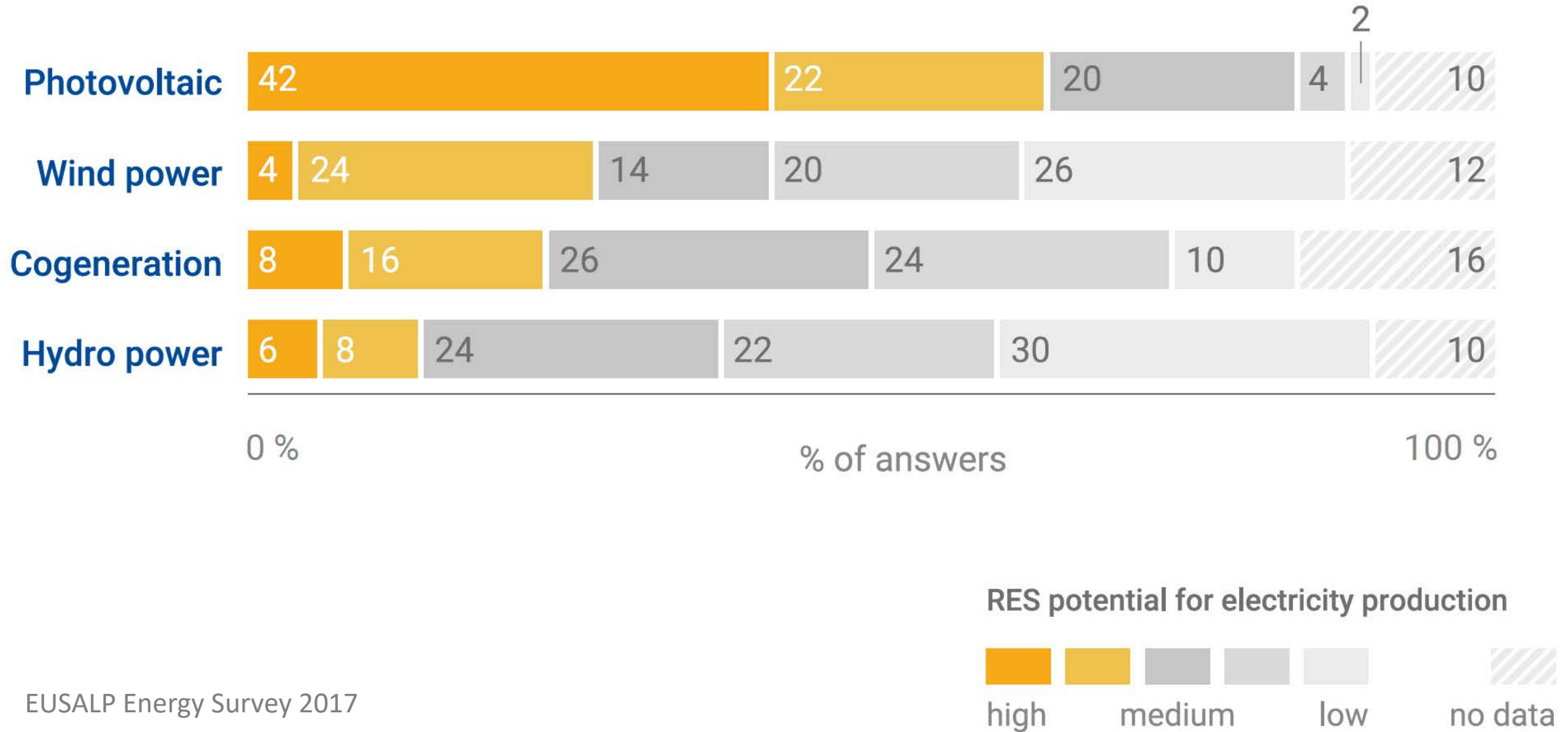


RES potential for heat production



EUSALP Energy Survey 2017

Survey - estimation of potential of electricity technologies



**How does a quantitative
estimation look like?**



Modelling of regional energy systems

Example of Southtyrol – Northern Italy

Eurac Research: W. Sparber, D. Moser, M. Prina, U. F. Oberegger, R. Perneti, G. Garegnani, R. Vaccaro, M. Cozzini

South Tyrol's Climate plan



Target



1,5 tons of CO₂
emissions
per person/per year

SÜDTIROL
KlimaLand



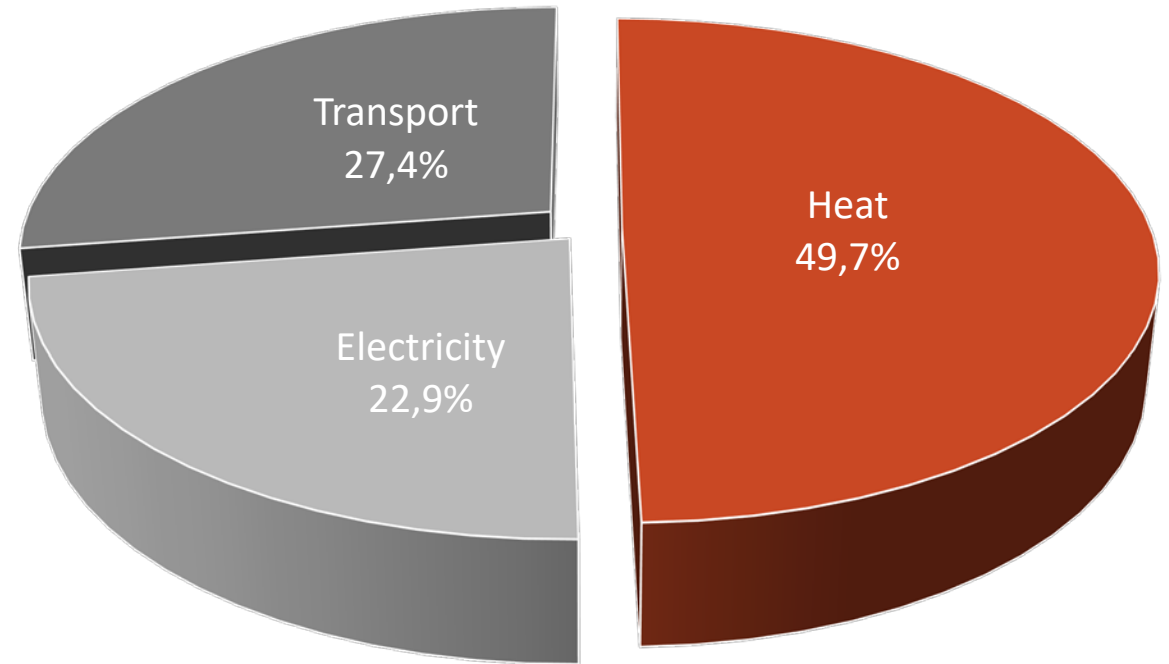
PIANO CLIMA

Energia-Alto Adige-2050



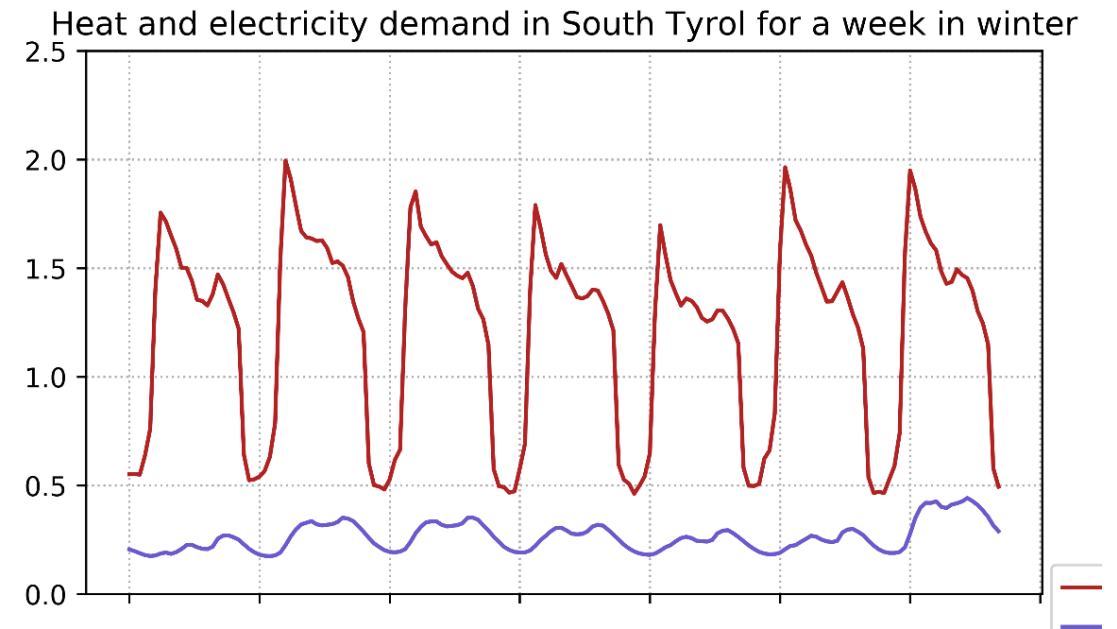
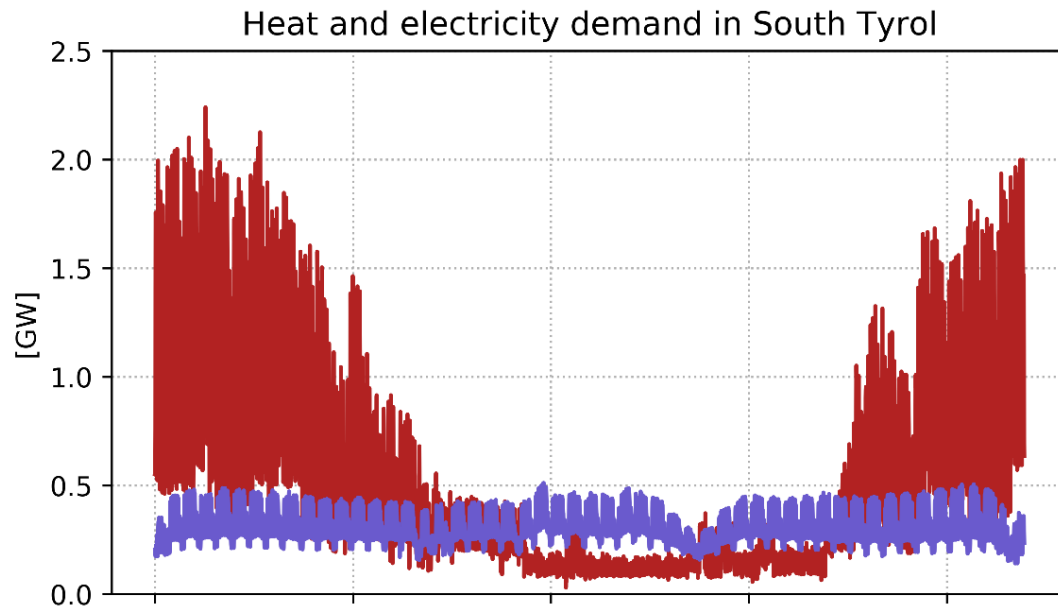
Energy consumption in South Tyrol: 12,4 TWh

- Electricity consumption = 2846.5 GWh
- Heat consumption = 6166.5 GWh
- Transport energy consumption = 3400 GWh



Overall energy consumption in South Tyrol, in the reference year 2014

Heat and electricity demand: hour by hour



Data Sources - South Tyrol:

- Electricity demand: Terna, Italian TSO. Distribution of the North zone. 2014
- Heat demand: Overall heating demand + profile of district heating of Bolzano, 2014. (Alperia)
- Heat for industrial applications is not included

Credits and further information Matteo Prina et. all

Hydroelectric



Assumption: constant hydroelectric use

An aerial photograph of a dense forest of tall evergreen trees, likely spruce or fir, covering a hillside. The trees are closely packed, and their green needles are visible against the darker trunks and shadows. The lighting suggests a bright day, with some areas of the forest appearing more vibrant green than others.

Biomass / Biomas

Assumption: constant use of biomass, no increase in biomass import. Slight possible increase in biogas use.

A photograph of a multi-story building undergoing renovation. The building has light-colored, vertically-slatted siding. Several windows are visible, some with white frames. Scaffolding is erected around the building, and a worker is visible on a platform. A crane is visible in the background. A semi-transparent white box with orange text is overlaid on the top left.

Energy efficiency

Credits: iNSPIRe project

Assumption: Detailed analysis of the building stock in South Tyrol and evaluation of building refurbishment and costs – see appendix 2.

Transport

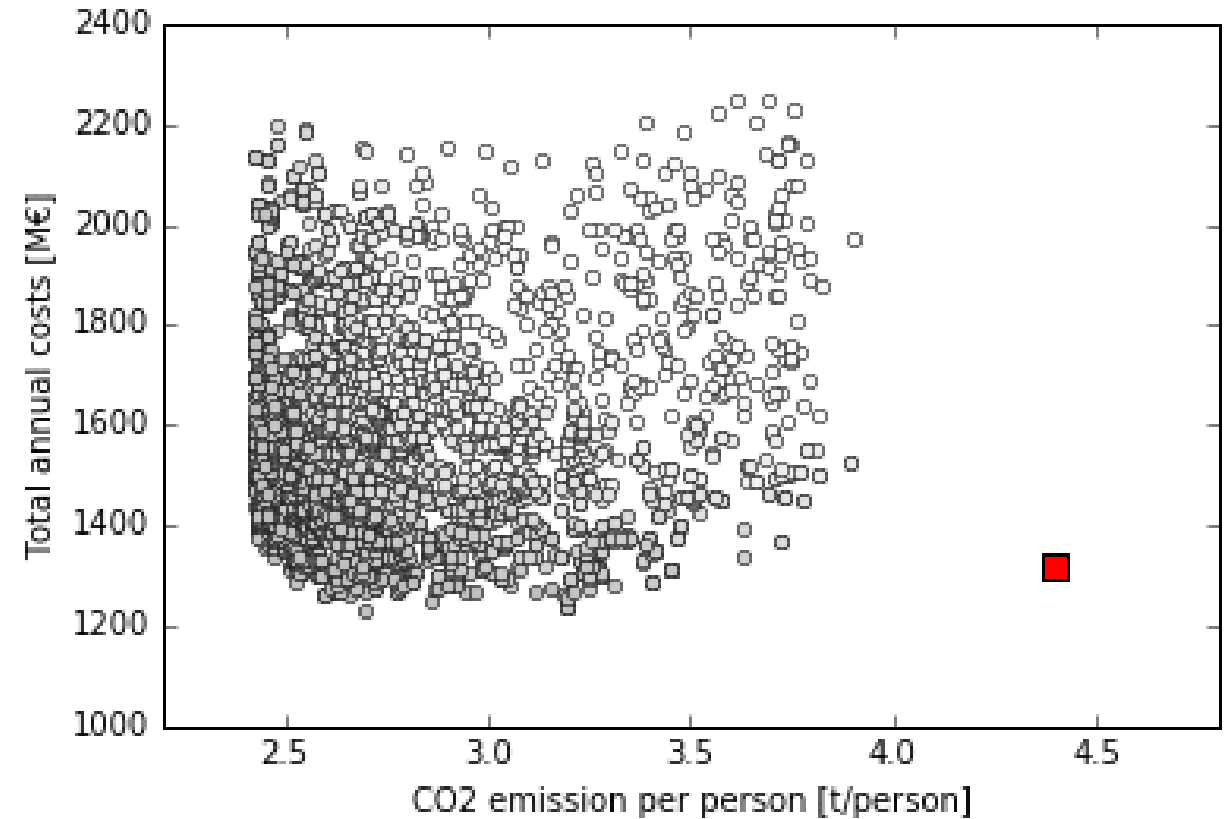
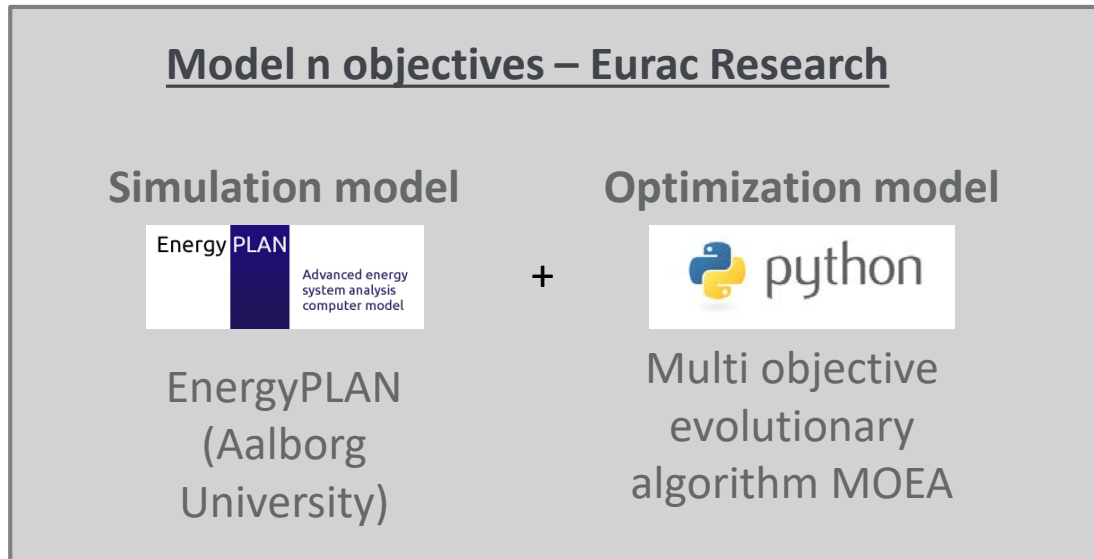


Credits: radio NBC

Evaluation of the total energy consumption and CO₂ emissions of the transport sector.
Analysis of the needed reduction to reach the target.

Optimization model of whole energy systems

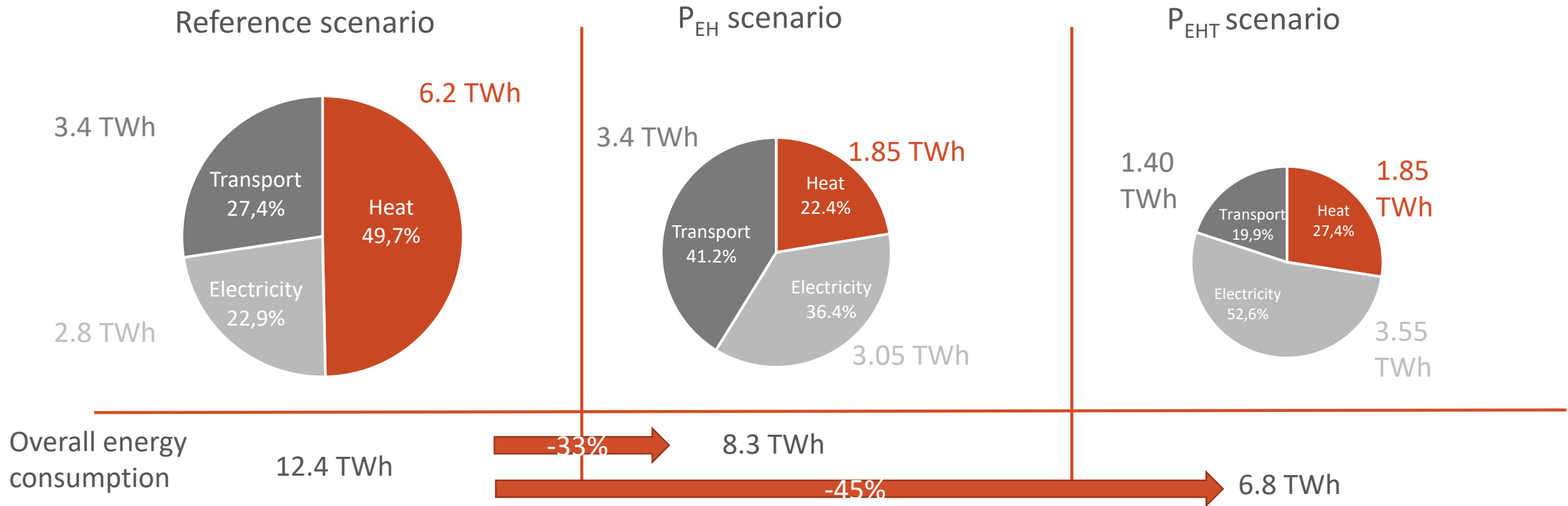
Optimization of the costs compared to CO₂ emissions, varying different parameters.



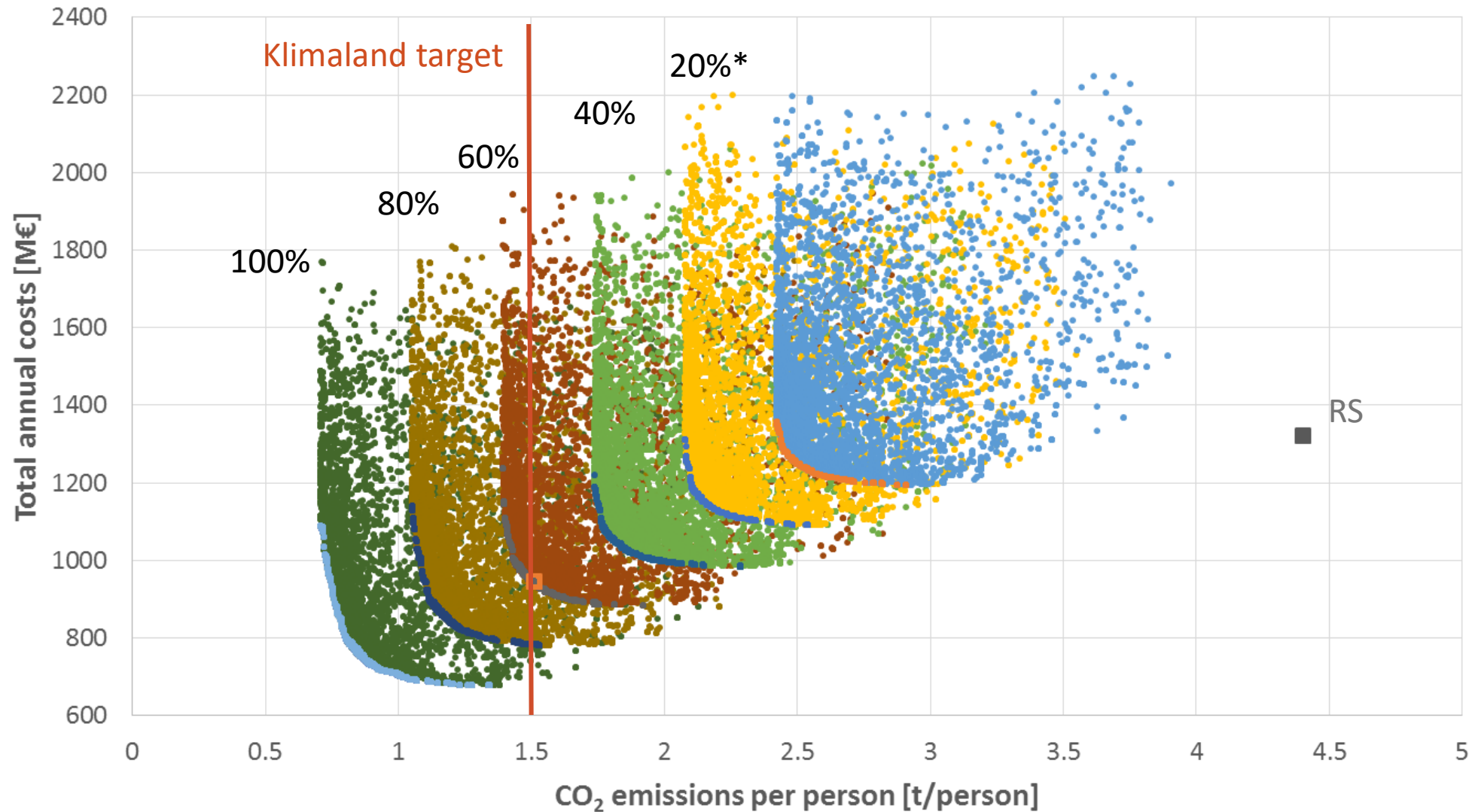
Each point on the chart shows total costs and CO₂ emissions per each energy system.

For each energy system, hourly energy production and consumption have been simulated.

Comparison of the overall energy consumption



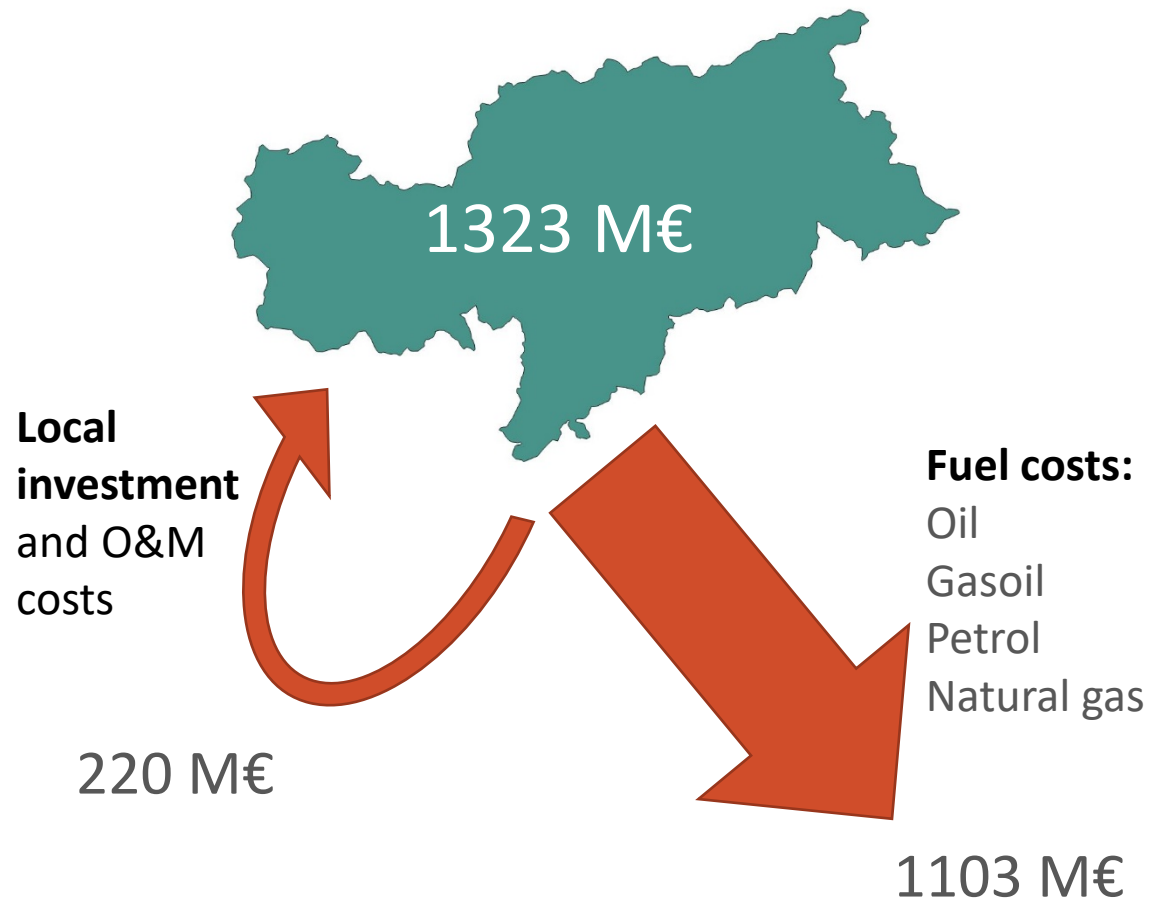
Result clouds showing cost and CO₂ emissions considering heating, energy efficiency, electricity and % of zero emission mobility



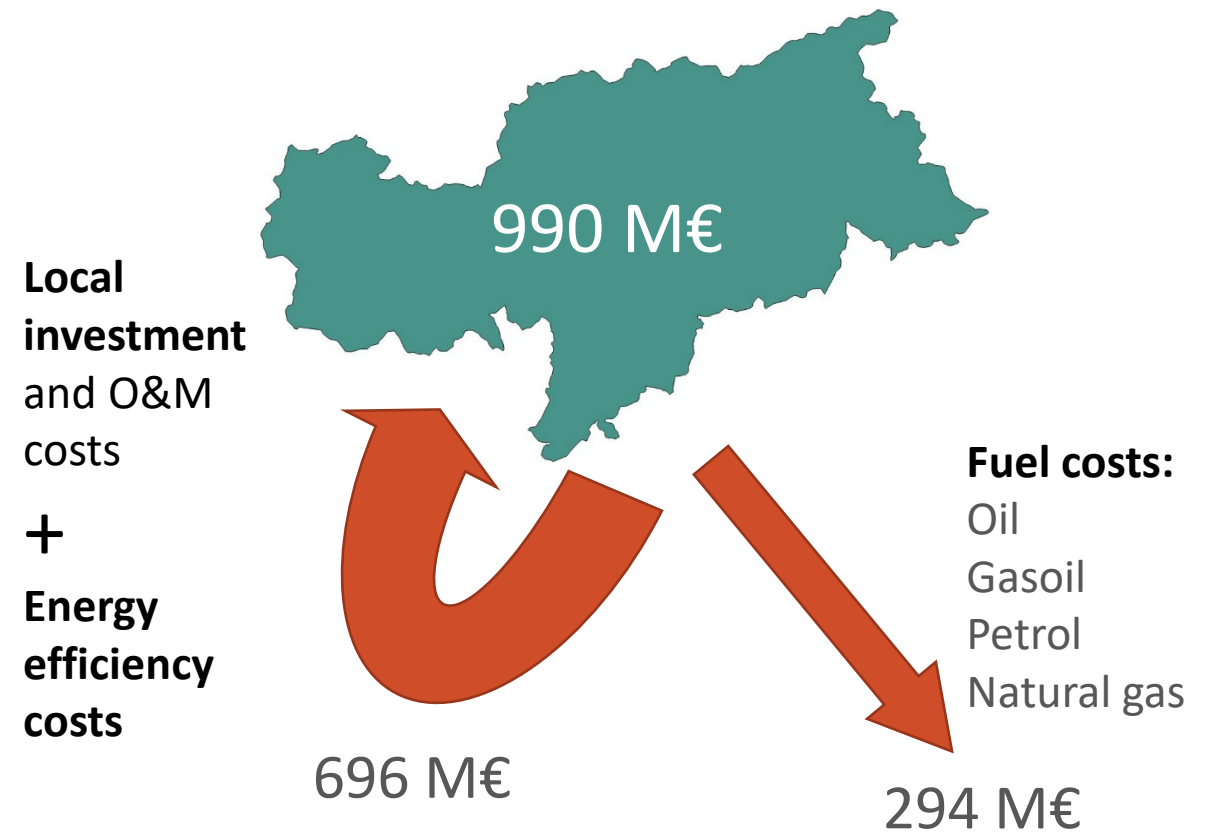
* Penetration percentage of zero emission transport on the overall kilometers covered in the transportation sector

Financial data

Reference scenario



P_{EHT} scenario

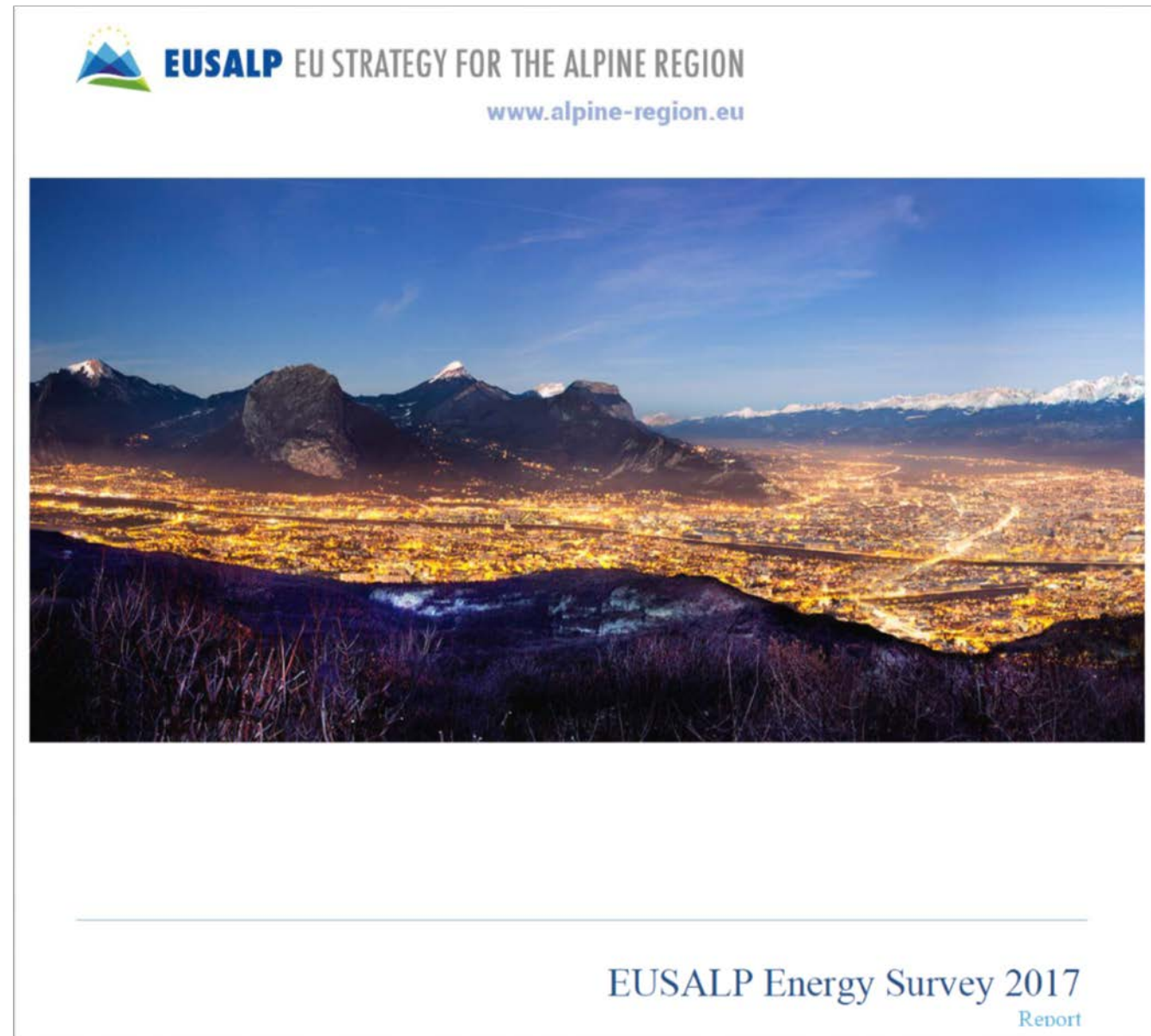


Conclusion ...

- The EUSALP area **has the potential to be a model region** in sustainable energy utilization ...
- In order to **reach the set targets intensive and continues effort in all sectors is necessary**. Especially renewable heat, energy efficiency in buildings, zero emission transport and renewable electricity ...
- By doing quantitative modelling for single regions, **financial data** show that target scenarios have a **similar overall cost** but a **relevant increase in local added value** ...

Further information ...

<https://www.alpine-region.eu/p/communication-area/publications>



Further information ...



Energy model – South Tyrol 2050

www.eurac.edu

W. Sparber, D. Moser, M. Prina, U. F. Oberegger,
R. Perneti, G. Garegnani, R. Vaccaro, M. Cozzini

<http://www.eurac.edu/en/research/technologies/renewableenergy/publications/Pages/default.aspx>



Thank you for your attention
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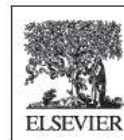
Urban Energy Transition: Renewable Strategies for Cities and Regions, second edition is the definitive science and practice compendium of energy transformations in the global urban system. This volume is a timely and rich resource as citizens, companies and their communities, from remote villages to megacities and metropolitan regions, rapidly move away from fossil fuel and nuclear power, to renewable energy as civic infrastructure investment, source of revenue and prosperity, and existential resilience strategy.

This book and its chapters present an entirely new edition throughout, in content, structure and science. Structured into four sections on design, technology, planning and finance, they feature:

- **advanced urban planning and design, infrastructure, landscape, mapping and modelling, and governance issues** related to urban renewable energy transformations
- **community and user enabling aspects:** energy access, prosperity and democracy, and urban renewable energy legislation, programs and incentives
- **individual and mass transport innovations** in the context of mobility related energy trends
- **city-wide solar strategies and urban thermal performance** planning, energy sector coupling, and distributed renewable energy and storage systems
- **practical innovations in renewable energy finance,** blockchain technology enabled peer-to-peer renewable energy trading, and the case for regional monetary systems and sustainable lifestyles.
- **analytic case insights into successful practices** from cities and regions around the globe that provide local, regional and country-specific governance and organizational perspectives

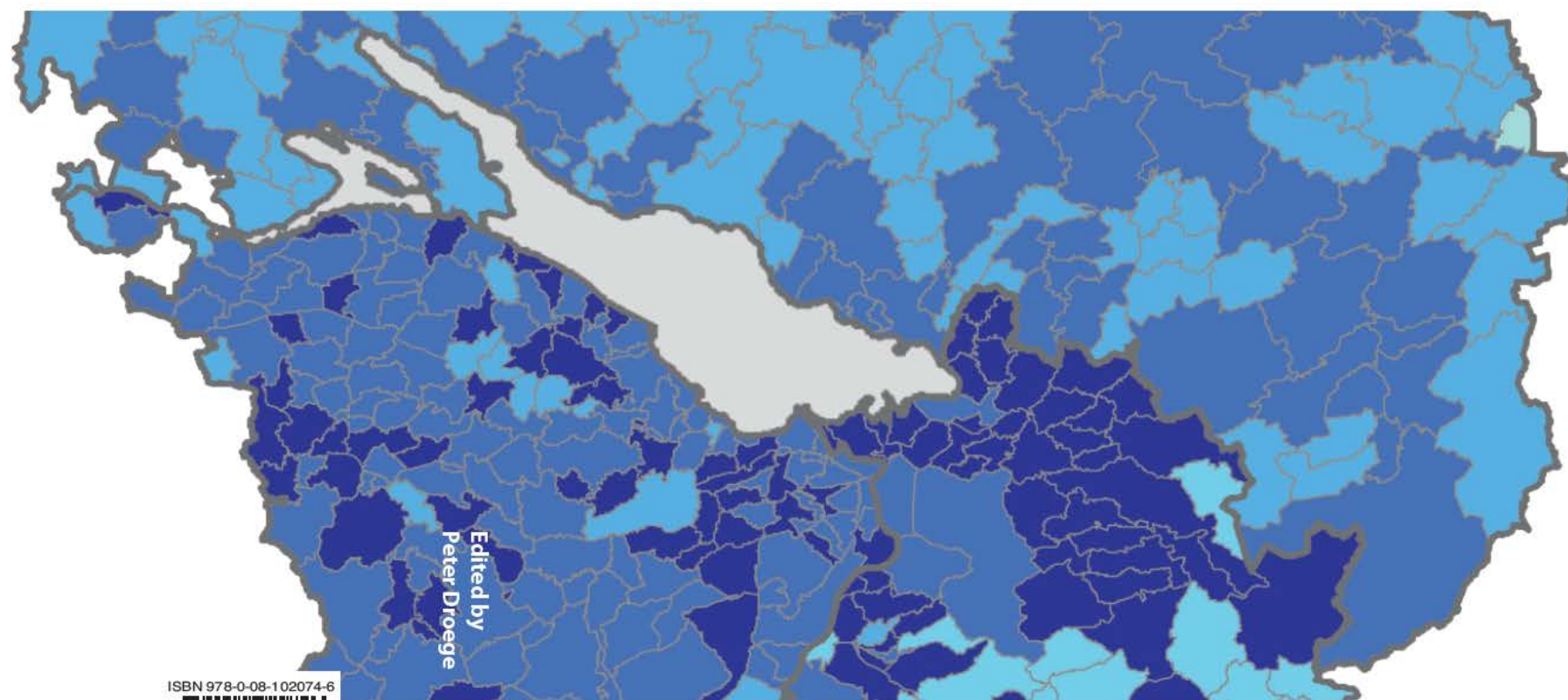
Urban Energy Transition, second edition is a cross-disciplinary handbook that enables an immediate, principled and systems-based understanding of essential policy frameworks and action for a sustainable, climate stable world.

Cover image: Degrees of self-sufficiency in locally generated renewable electricity reached by 2050 under a best-practice scenario, mapped for each of the local government areas across Europe's Lake Constance region.



Urban Energy Transition

Renewable Strategies for Cities and Regions



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