



PLACE-BASED RESEARCH - THE MVI CAMPUS TRANSITION

The MonViso Institute (MVI) is a real-world laboratory (RWL) for research on sustainability transitions and systemic design - the transition on various scales is a research process in itself, in real time. The MVI engages in various related research topics in collaboration with partner organizations and offers co-advising of Bachelor, Master and Doctoral student theses.

General research topics

Integrative building systems and materials, Renewable Energy Systems, Sustainability Transitions, Community Resilience, Alpine Urbanism, e-Mobility, Circular Economy, Regenerative Design, Permaculture, Responsible Tourism, Co-Design of (Forest) Ecosystem Services, Outdoor Sports and Education

Specific topics, questions and theses

The accompanying research about the transition of the abandoned Serre Lamboi compound to the MVI mountain campus encompasses a rich array of transdisciplinary topics.

Integrative building systems and materials

- Comparative and exemplary whole systems analysis for different building types and energy systems as planned on the MVI campus
- Design concept of a closed-loop water system for a tiny house, the "Piccolo" on campus
- Design concept of a net-positive energy system for a tiny house, the "Piccolo" on campus
- Re-think building standards by whole systems analysis of effective leverage points: relation of system boundary, embodied grey energy, cradle to cradle thinking, scalability of regenerative materials, human behavior, economic leverage and effectiveness for comparative scenarios
- Substitution of Portland cement with Geopolymer based solutions, i. e. Trass, for base plates and foundations. As reinforcement we are looking into hemp fibers, grown onsite, to substitute steel.
- Comparison of air exchange systems: mechanical/manual vs fully automated heat recovery, and the influence of the human factor
- Design criteria for traditional stone walls in the Piedmont
- Development of modular, flexible wall building systems with local stones - development of the "Observatory" MVI building and its flexible "Innovation Nest"
- Whole systems design of the water concept of the MVI campus

Renewable Energy Systems and mobility

- Net effects of heat recovery systems on water- and air balance – embodied grey energy related to gains in efficiency by time and location
- Energy storage systems, i.e. system state transition liquid-gas-liquid, and their integration with micro grids and e-mobility
- Solar panel options (PV/thermal) as design elements in traditional stone roofs with a focus on underside visibility of roof overhangs
- Wind power potential of "bladeless" oscillating wind turbines on the MVI campus
- Whole systems design of the renewable, plus-energy concept of the MVI campus, including e-Mobility

Community Resilience and Alpine urbanism

- Balancing local traditional knowledge and international innovation

Economics, business models and costs

- Affordability in re-building traditional stone huts: cost-saving solutions
- Crowdfunding and public-private partnerships (PPP)

Agro-ecology, permaculture and land use management

- Growing industrial hemp and understanding the systemic use of this plant, from soil improvements to composites and 3D printable plastics
- Paulownia trees – which type of these super fast growing trees can produce "the aluminum of wood" on this high elevation? What is the ecological and economic potential of it?

Do you have interest in a collaboration or do you miss a topic? Please get in touch with us!

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A Real-World mountain Laboratory for research, education and entrepreneurship
in sustainability transformations and systemic design

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