SWICE

Sustainable **W**ell-being for the **I**ndividual and the **C**ollectivity in the **E**nergy transition

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Project supported by the Swiss Federal Office of Energy's SWEET programme, under the CALL 1-2021 "Living & Working"

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SWEET call 1-2021 “Living & Working”

- Highly inter- and transdisciplinary
- Representative of Swiss diversity
- Participatory approach: Public - Private - People Partnership
- Living Labs for the implementation, test and evaluation of new scientific approaches and technologies

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SWICE CONSORTIUM

10 Higher Education Institutions (Coordination by EPFL)

3 from ETH domain: EPFL, ETH Zurich, EMPA

3 cantonal universities: UniL, UniGe, UniFr

4 universities of applied sciences: HEIA, HSLU, ZHAW, SUPSI

4 Research and Consultancy Companies

COOPERATION PARTNERS

9 Public sector entities

9 Private sector entities

3 Public enterprises

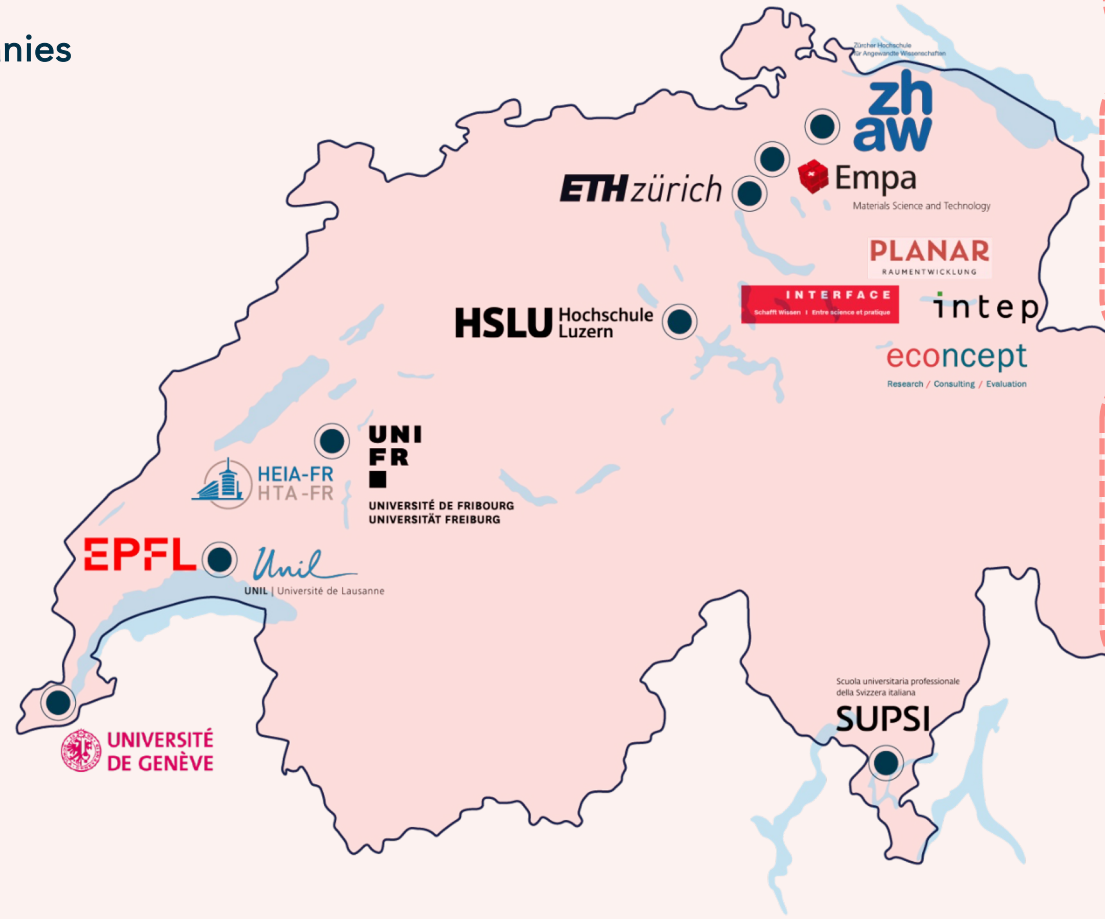
5 Non-Profit Organizations

BUDGET & TIMELINE

~CHF 22.1 Mio of which

9.95 Mio from SFOE

8 years (2022-2029)



Public sector

Private sector

Public enterprises

NPO
(research centre, non-profit, association)

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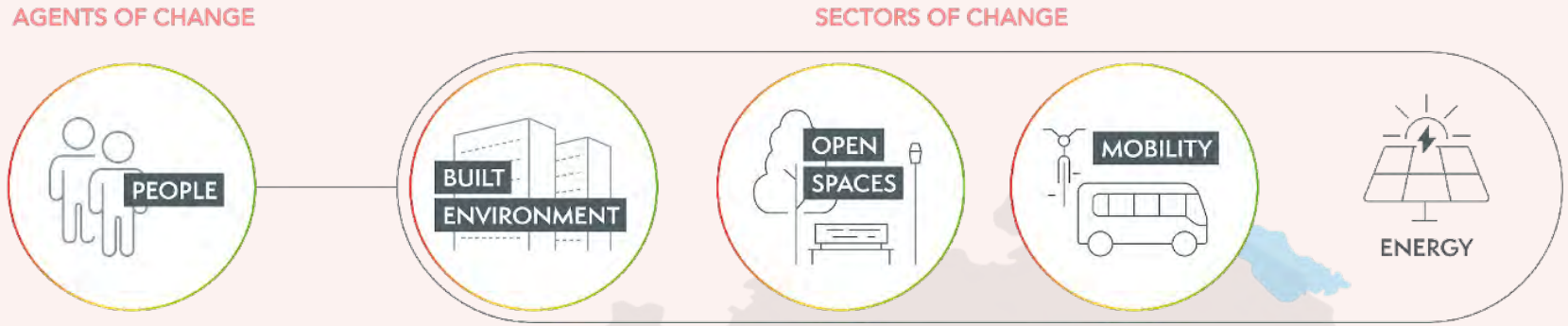
SWICE CONSORTIUM – actors from EPFL



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LA3

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IPESE

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LIPID

Dr. Jan Wienold
(& Prof. Marilyne Andersen)

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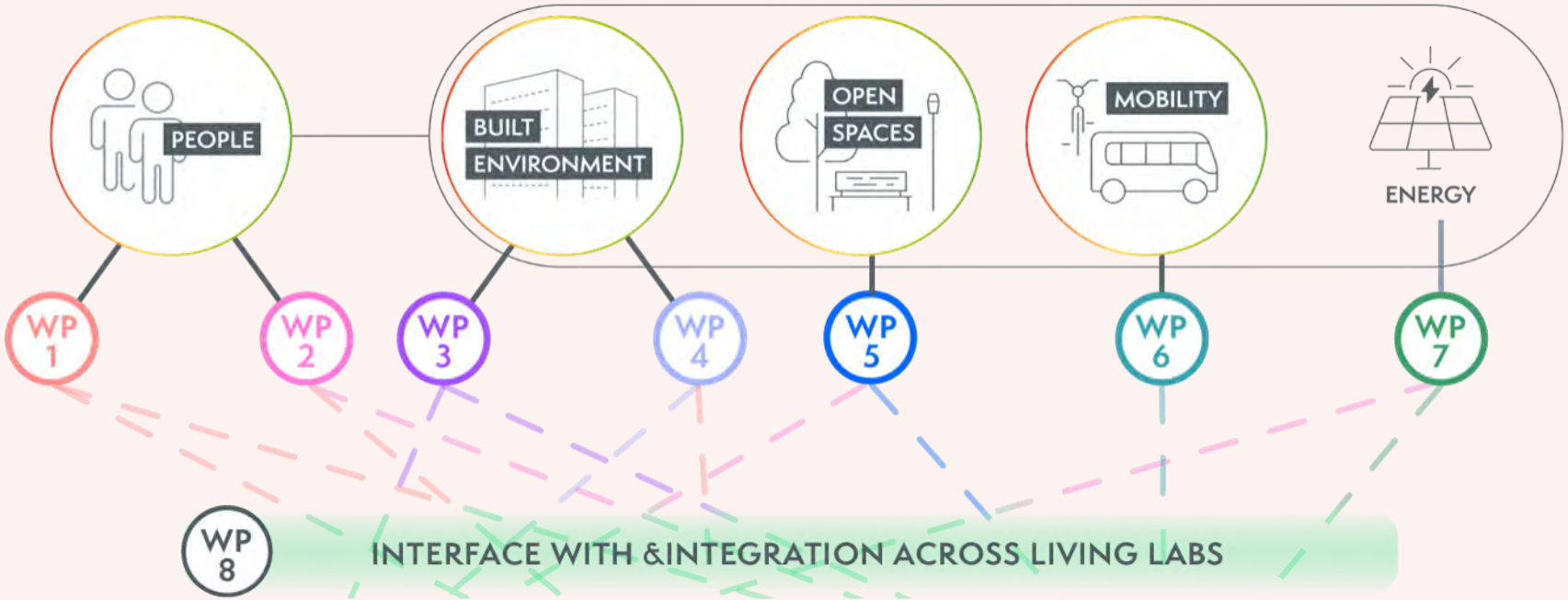
SWICE ORGANISATION AND VISION



towards an **energy transition** with **wellbeing** for all through **acceptability of (behavior) change**

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SWICE Y2 HIGHLIGHTS

1 Policy

- Remote Work in Energy Labelling
- Swiss Habitat Provisioning Framework
- Decent Living Energy Model

2 Methodology for Living Labs

- LL Toolkit and Coordination Group
- Meta Action Plan

3 Interventions

- Open Spaces (Geneva and Fribourg)
- Suurstoffi
- Lokstadt
- Eglantine

4 Decision-support tools

- Sustainability Behavior Framework and Typology
- Behavior Assessment Questionnaire
- Prototype Mobile Application

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RESEARCH ARTICLE

The effects of teleworking on CO_2 emissions from commuting: baselining key data to investigate transformative change in living labs

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The quantitative monitoring of the greenhouse gas (GHG) mitigation potential of interventions is central to a living-lab approach and is a methodological challenge. Valid population data on consumption patterns and mobility behaviour are often scarce, especially when the living lab is initially set up (for example, the need for baseline data before an intervention). In the context of transportation studies, a cross-sectional survey was carried out to baseline key data on GHG emissions generated by commuting before implementing an intervention. Based on this information, the GHG emissions from commuting were calculated and analysed using a linear regression model. Results show the effects of different variables, such as the share of teleworking within a working week, the regular workplace location, and attitudes towards individual mobility and former relocation behaviour. An increase in teleworking of 10 per cent based on weekly working time leads to a reduction of approximately 60 kg of GHG (8 per cent) emissions a year. Our results serve as baseline key data to analyse upcoming (temporary) interventions (for example, new coworking spaces within our living lab). Hints for rebound effects, limitations of our study and future interventions are discussed.

Keywords living labs • teleworking • commuting • CO_2 emissions • rebound effects

Key messages

- Data to assess the effectiveness of interventions in living lab studies is scarce when a living lab is set up.
- Teleworking in a living lab can be seen as an intervention. Based on the key data generated, this intervention can be evaluated.
- Multivariate linear regression reveals that an increase in teleworking of 10 per cent lead to a reduction of 60 kg of CO_2 emissions a year.

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Systems perspectives on transforming Swiss housing by 2040: wellbeing, shared spaces, sufficiency, and de-sprawl

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The Swiss habitat–buildings and related mobility–faces multiple interconnected problems which can only be solved together. These include high energy consumption, significant climate impact, excessive material use with low circularity, accelerating urban sprawl and ecosystem destruction, high mobility costs, low inclusion, and mixed wellbeing outcomes. Guided by values of wellbeing for all within planetary boundaries, we propose a normative scenario based on a nationwide moratorium on new construction until 2100, coupled with four simultaneous neighborhood-scale interventions: renovating buildings to achieve energy class A with high indoor environmental quality, creating flexible shared living spaces, ensuring essential daily services are available within each neighborhood, and deconstructing unneeded settlements. Action levers, coordinated efforts on multiple system leverage points, are here combined with rethinking needs satisfiers. Our model predicts that full renovation could be accomplished in 14–18 years, significantly reducing labor, energy, materials, and costs both during and after the transition. Furthermore, it could reverse urban sprawl to levels seen in 1935 or even 1885, depending on deconstruction choices. These findings suggest that demand-side policies could be implemented with low risk, enhancing wellbeing, energy resilience, biodiversity, and climate action, thus providing a strong foundation for societal dialog and experimentation.

KEYWORDS
systems thinking, wellbeing, sufficiency, demand-side solutions, low energy demand, reversing urban sprawl, shared spaces, new building moratorium

1 Introduction

The Swiss human habitat, consisting of buildings, open spaces between buildings, and daily mobility induced by the position of buildings, is linked to a wide range of problematic outcomes, making it much harder to reach the goal of wellbeing for all within planetary boundaries.

Habitat-related issues encompass several critical areas. Energy use and associated GHG emissions remain significant concerns (BFE, 2023; BAFU, 2023a). Material use is high, with a low circularity rate of just 6.9% (Circle Economy, 2023). Urban sprawl has been accelerating since 2002, contributing to ecological habitat degradation (Schwick et al., 2018). High mobility use leads to various costs, including accidents (resulting in 15,200 lost life-years in 2020), air pollution, noise, and travel time (ARE, 2023). Additionally, housing-related capital accumulation is unequal, which exacerbates inequality in housing and life outcomes (Bonnet et al., 2014). Wellbeing outcomes are mixed, as reflected in the housing indicators of the OECD Better Life Index (Van Zanden et al., 2020). Similar outcomes are observed in other rich countries.

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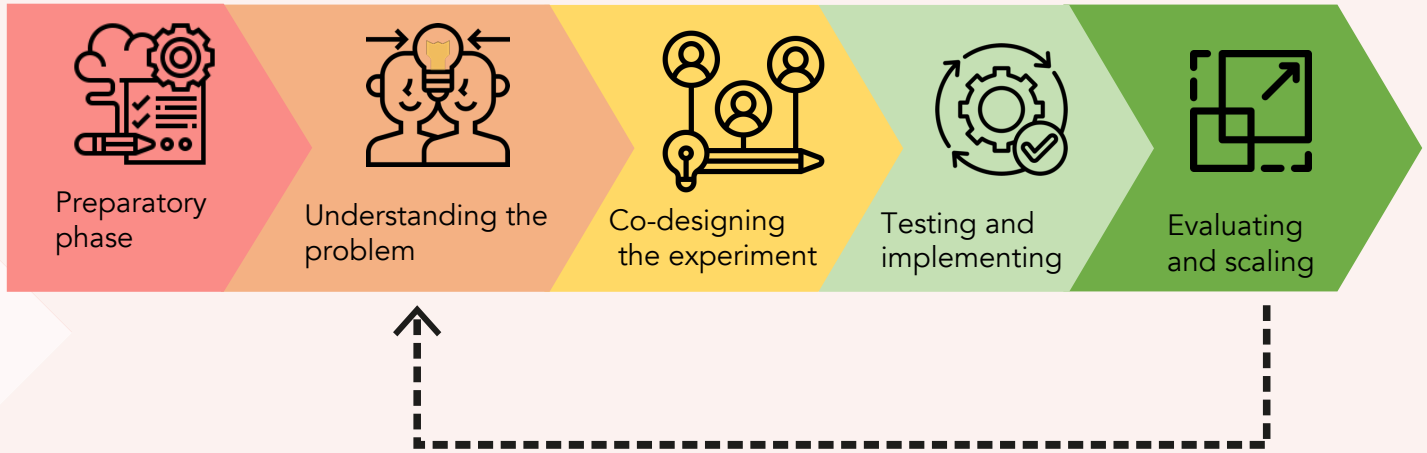

3 **Interventions**
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- Eglantine

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EPFL Campus

SLL

Open Spaces

Eglantine

Preparatory phase

Understanding the problem

Co-designing the experiment

Testing and implementing

Evaluating and scaling

Suurstoffi

Lokstadt

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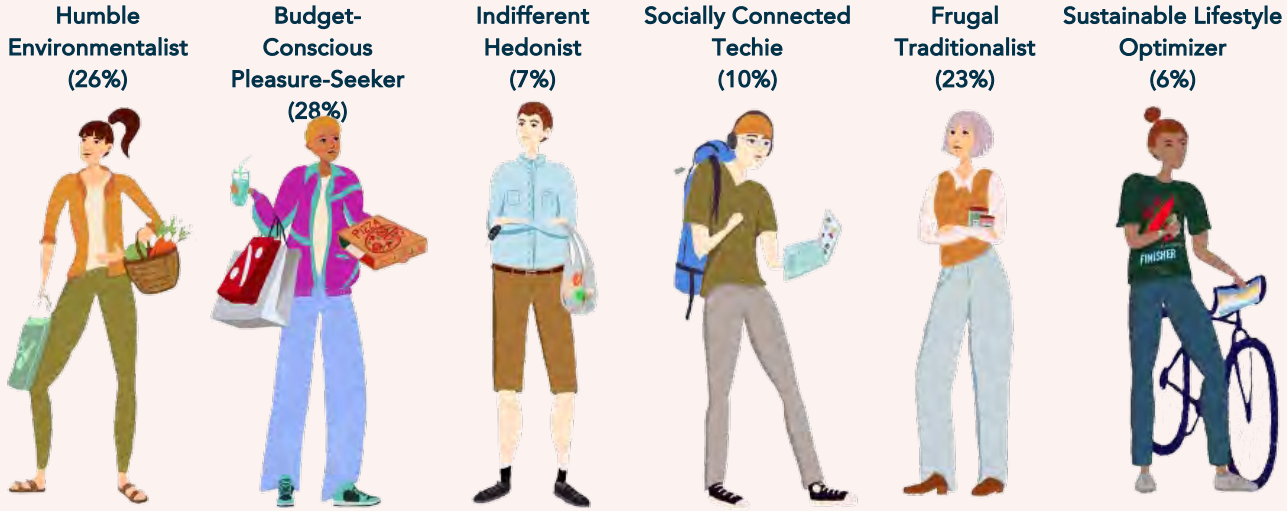
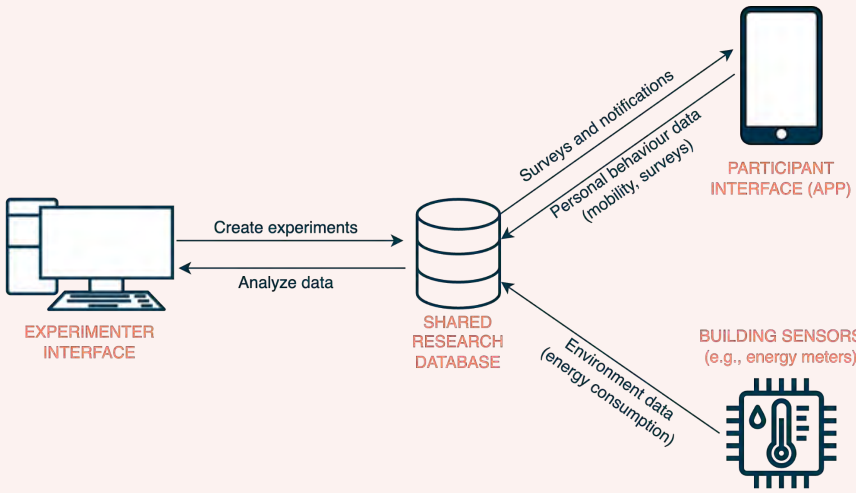
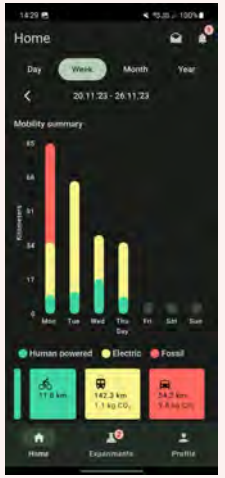
The 6 Lifestyle Types of Sustainability-Relevant Behaviour



Illustrations by Jasmin Oberkalmsteiner, ZHAW





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