



## Interactions and design process

### Research programme (2014 – 2018)

The Federal Council has declared its intention to become a 2,000-watt society by 2150, with an interim stage set at 3,500 watts in 2050. For the building of the Smart Living Lab [1] to achieve this interim objective, an interdisciplinary research programme financed by the Canton of Fribourg and EPFL was set up. Led by the Building2050 Group, around thirty researchers from EPFL, the School of Engineering and Architecture Fribourg and the University of Fribourg participated in this exciting mission between 2014 and 2018 to design a model building for the future. [2.3].

Keywords | *2,000-watt society, thermal envelope, user comfort, energy production*

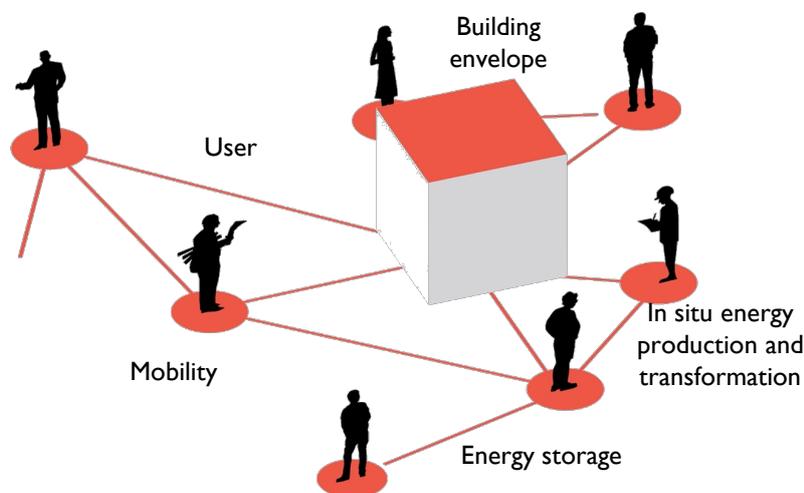


Figure 1. Key focuses developed during the research programme.

By concentrating the research on energy and comfort issues, as well as architectural quality, the researchers identified key focuses to work on as part of the research programme:

1. the user for whom the building is being constructed
2. the building envelope
3. in situ energy production and transformation
4. energy storage
5. connection to mobility

The research programme led to editorial project “Towards 2050”, the aim of which was to document the ambitious undertaking of the Smart Living Lab over the different stages of its development. This collection “shows the process leading to the scientific definition of the building’s performance, particularly in terms of architectural quality, climate issues, potential bioclimatic strategies, energy performance, integration of renewable energy, lifecycle analysis and functional flexibility.” [2]. In May 2019, the Fribourg research centre completed the first two works of this project, published in the following Park Books editions:

- *Thinking, Visions for Architectural Design* [4] presents interviews with twelve leading experts from a wide range of professional and geographical backgrounds, capturing the essence of their visions for sustainable buildings for 2050.
- *Exploring, Research-driven Building Design* [5] outlines the results of the research conducted in the Smart Living Lab since its establishment, which prefigured the process used to design its building. The book sets out the methodological approaches as well as the tools developed with which it is now possible to create building that achieves the environmental objectives of the energy strategy set for 2050, while meeting comfort requirements and providing optimal usage quality.

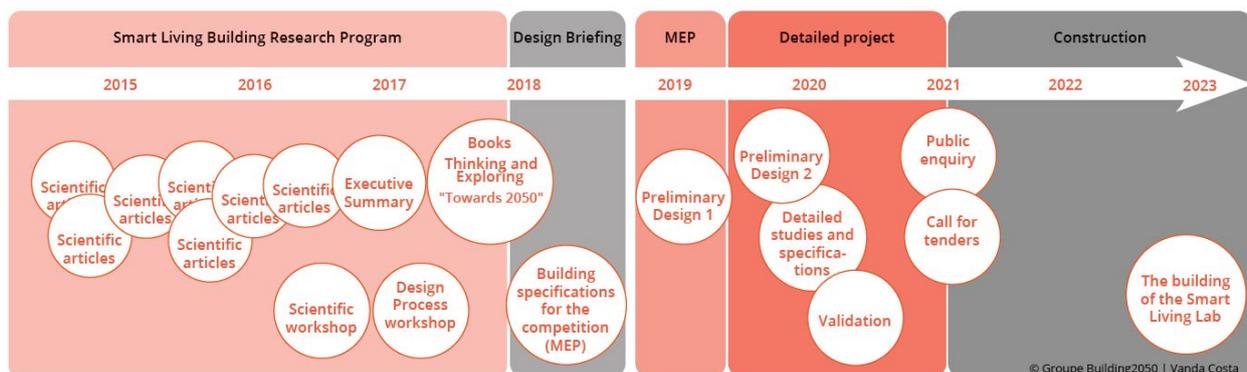


Figure 2. Different development stages for the Smart Living Lab building from its creation in 2014 until its construction in 2023.

This research programme has been monitored by the parallel studies mandate (MEP) carried out in close collaboration with the building’s researchers and future users. [1]. The call for tenders for general contractors, resulting from the winning project developed by Behnisch Architekten, was launched in March 2021. The building of the Smart Living Lab is being constructed on the blueFACTORY site, and is expected to be completed at the end of 2023.

## References

- [1] Building of the Smart Living Lab. <https://www.smartlivinglab.ch/fr/infrastructures/smart-living-building/>
- [2] Jusselme, Thomas et al. (2017). *Smart Living Building Research Program - Executive Summary*.
- [3] Poncety, Amélie et al. (2016). *Graphical representation of the smart living building research program*.
- [4] Marilyne Andersen, Emmanuel Rey. (2019). *Exploring Research-driven Building Design. Towards 2050*. <https://www.park-books.com/index.php?pd=pb&lang=de&page=books&book=1010>
- [5] Marilyne Andersen, Emmanuel Rey. (2019). *Thinking Visions for Architectural Design. Towards 2050*. <https://www.park-books.com/index.php?pd=pb&lang=de&page=books&book=1009>