

# Self Sufficiency and New Sustainable Paradigms: Autonomous Alpine Huts of the European Alps

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Programme used: SketchUp, Photoshop, Illustrator, and Indesign



## Introduction

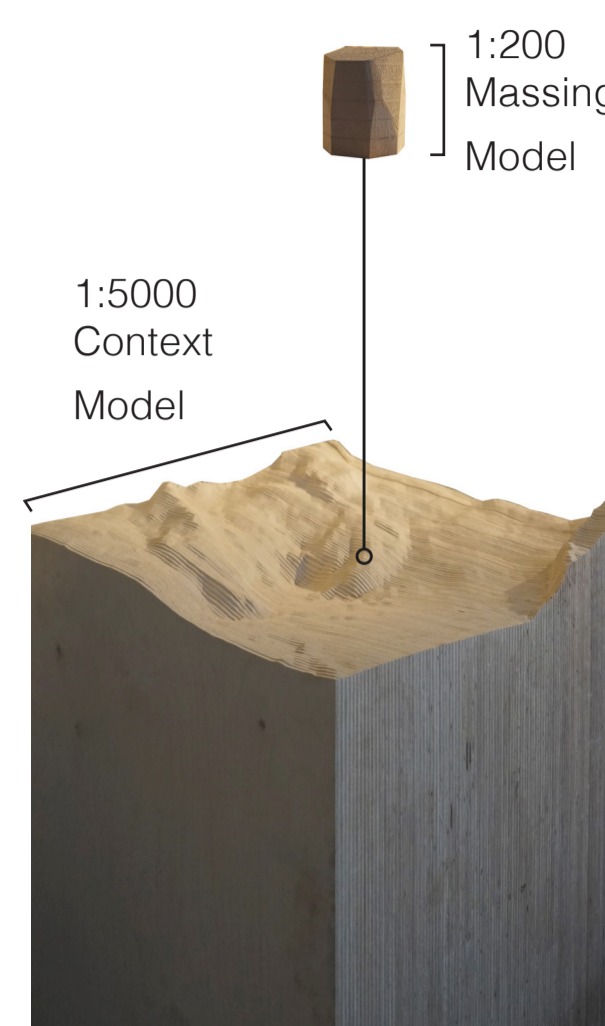
**Autonomous:** *adjective* - having the freedom to act independently/ has the freedom to govern itself.

For over a century alpine adventures have been supported by a range of huts from simple cabins to multi-storey structures. Majority located in low altitudes have easy access routes. However, those situated in remote contexts require specific requirements to sustain life with minimum impact on the environment. In recent years many huts have been commissioned to take on a sustainable approach to their design in material resource use, energy conservation, energy generation, water use and waste recycling. This research is a pilot study to investigate how this new generation of alpine huts (Monte Rosa Hut and Cabane de Velan) contribute to the experience of climbers, and to what extent these strategies are sustainable and affect the perception of the atmosphere.

## Contextual Understanding

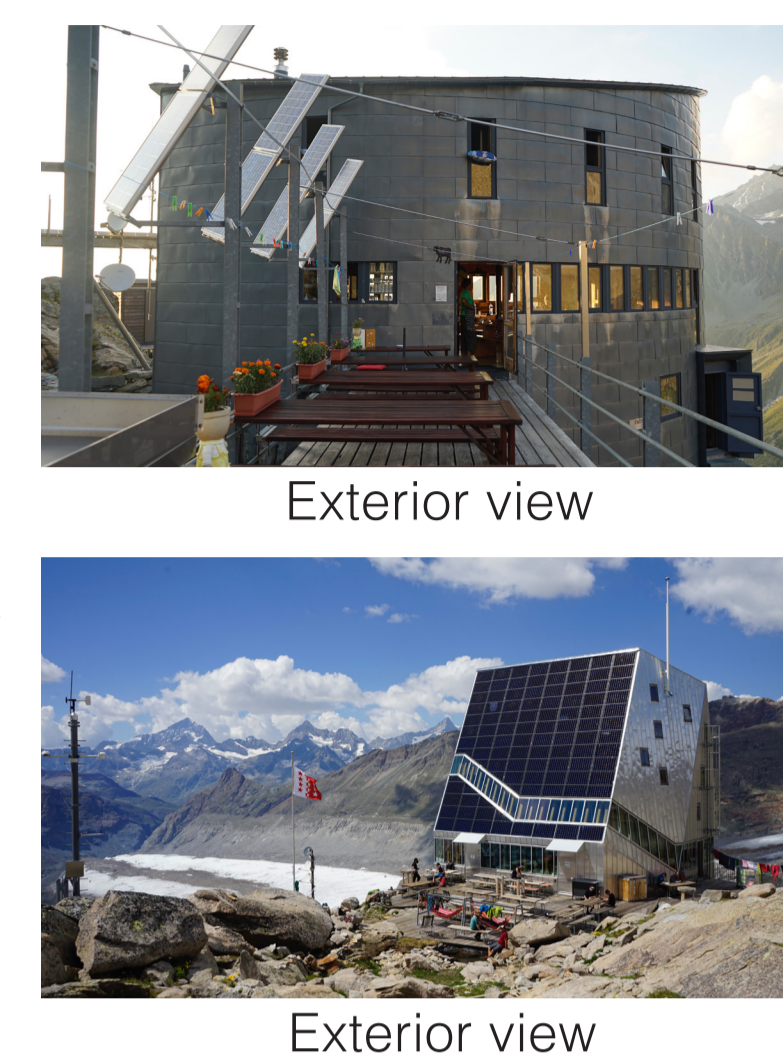
Making a contextual model of the site of Monte Rosa Hut, gave an insight on why the hut is orientated in a certain way and how the form of the building reacts to the environment.

For example, the south side of the hut is facing the inclination of the mountain meant that water could be funnelled to the water tank. Correspondingly the solar panels are facing the south and south-west side with an angle to catch maximum solar energy. Furthermore, the form of the hut responds to the wind direction which makes the hut more durable.



## Field Trip

Travelling to Switzerland to visit Cabane de Velan and Monte Rosa Hut. Allowed us for a more in-depth understanding of how the sophisticated strategies function by talking to the hut owners. Likewise, by engaging the visitors with the questionnaire, we also manage to understand their experiences with the huts.



Exterior view

Exterior view



Visitors filling in the questionnaires

Understanding the huts strategies

Cabane de Velan  
Monte Rosa Hut

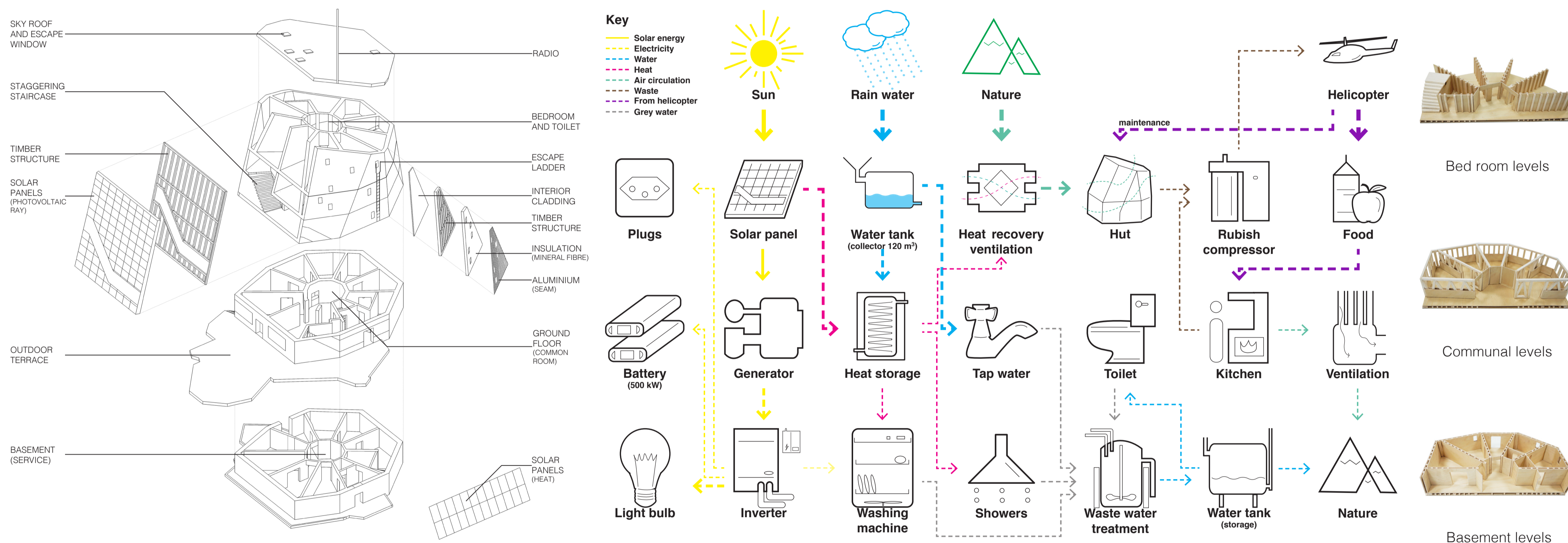
## Aims

1. Provide an understanding of the sustainable, construction and programmatic strategies of the hut, obtained from primary and secondary sources.
2. Develop a questionnaire to understand visitors and hut owners perceptions of atmosphere and experience of the hut.
3. To use the findings to develop an alternative model of sustainability that considers the technical challenges with experience.

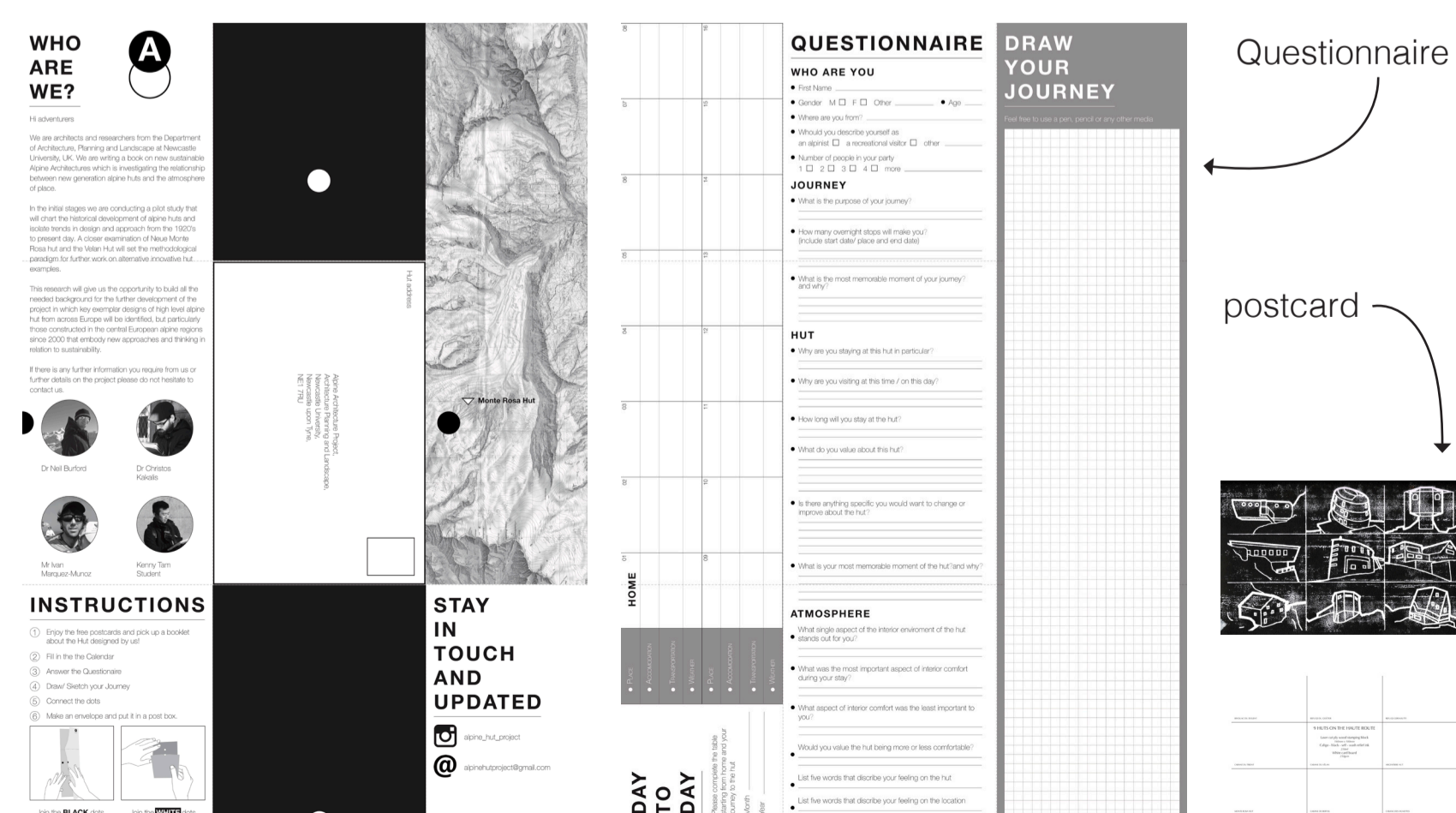
## Pilot Research Methodology

- 1a. Collecting the primary results of the experience, atmosphere and the journey from the visitors through a questionnaire.
- 1b. Collecting primary and secondary information from the field visit, interviews and literature reviews, of the material resource use, energy conservation, energy generation, water use and waste recycling
2. Develop a set of digital imagery and models to represent the quantitative and qualitative data at a range of scales and forms.
3. Analysis the completed questionnaires and create a diagram that reveals the most frequently used words that describe the hut.

## Findings: Monte Rosa Hut sustainable strategies and construction



## Questionnaire



## Findings: Questionnaire



## Discussion on findings

1. Monte Rosa Hut is a highly complicated building situated in a very challenging context.
2. High levels of comfort are aimed while using minimum energy, this was achieved for example from the use of heat recovery ventilation system.
3. Questionnaire responses revealed that users value the use of natural materials (timber) and the way the building form and spaces connects to nature and the surrounding environment. Views and natural light being an essential factor too.
4. Due to all the strategies and the experimental of the design, it could lend itself to an ugly structure and also a lack of an individuals control.
5. It attempts near 100% autonomy.

## Conclusion

Monte Rosa Hut is one of the latest and most advanced near autonomous alpine huts to date, but it reveals a paradox in the relationship between people, resource efficiency and experience of place. This Pilot Study has begun to identify some of the drawbacks and raises questions on how to balance the experience with the need to reduce energy and conserve scarce resources through highly technical systems. Ultimately, through the desire to provide higher levels of comfort at reduced energy use. The survey responses indicate that internal environmental conditions at Monte Rosa were too hot and there was no independent user control over the internal environment. However, perhaps the most crucial finding indicates that in striving for 'optimum' comfort can result in negative experiential qualities.

Reference: Nemetschek Vectorworks. (2011) Case Study CH1: Monte Rosa Hut: Sustainable Lodging in the Alps [online]. Available from: [www.vectorworks.net](http://www.vectorworks.net) [Accessed 18th July 2018].  
Hellweg, S. Witttrnwiller, M. Goymann, M. (2008) 'Environ. Sci. Technol', 'Environmental Decision Support For The Construction Of A "Green" Mountain Hut, Volume 42/ 11, 4061.