

SIA-Effizienzpfad Energie

La voie SIA vers l'efficacité énergétique

La via SIA verso l'efficienza energetica

SIA Energy Efficiency Path

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FOREWORD

The objective of the SIA's *Energieleitbild Bau* (Energy Guidelines for Buildings) [1] is to establish a consistent and sustainable basis for Switzerland's building stock and encourage intelligent use of the resource energy. The long-term goal is to achieve a sustained primary energy use of 2000 watts per person and emissions of no more than one tonne of CO₂ equivalent per person and year. This Technical Specification and the associated documentation SIA D 0258 *SIA-Effizienzpfad Energie – Ergänzungen und Fallbeispiele zu SIA 2040* (SIA Energy Efficiency Path – supplements and case studies for the Technical Specification SIA 2040) [2] form the basis for the implementation of an intermediate goal for the year 2050.

The 2000-Watt Society takes into account the total primary energy use and total greenhouse gas emissions from all consumption sectors in Switzerland. This Technical Specification is limited to setting targets for non-renewable primary energy use and greenhouse gas emissions for six building categories; thus, taking into account the big request for a wider applicability of the instrument.

Due to their impact on climate, greenhouse gas emissions are an important environmentally relevant factor. Switzerland has set itself the goal of reducing greenhouse gas emissions and is implementing this as part of the international reduction commitments. In the 2000-Watt Society, on which the Energy Efficiency Path is based, greenhouse gas emissions also represent the second target value after primary energy.

The objective of the 2000-Watt Society is extremely ambitious. Detailed scenario considerations and possible development in the building sector up to 2050 can be found in the study *Erweiterung des Gebäudeparkmodells gemäss SIA-Effizienzpfad* (Expansion of the building park model according to the SIA Energy Efficiency path) [3]. It turns out that achieving the milestone of the 2000-Watt Society by 2050 will be crucially influenced not only by technical but also by social and economic factors. This goal cannot be achieved without significant developments in these areas – there is a great need for both political and legal action. In this respect, the following assumptions have been made:

- The space requirement per person for the considered building categories remains constant. This will require a shift away from a long-term trend towards increasing space requirements.
- In the year 2050, the average energy consumption of cars will be less than it is today by a factor of 3.
- The daily distances travelled, in particular with cars, will not continue to increase.
- All new buildings will meet the target values specified in this Technical Specification. This will require a significant improvement in terms of energy efficiency in comparison with existing practices.
- By 2050, all existing buildings will be modernised to meet the target values for conversions. This will require a multiplication of the rate of renovation and a striking improvement in the quality of the conversions in terms of energy efficiency.

In order to compensate for unavoidable deviations from the aforementioned assumptions in reality, the following potentials are notably anticipated within the scope of this Technical Specification:

- A development of the Swiss electricity mix, which aims at significantly reducing greenhouse gas emissions and non-renewable primary energy content.
- A forced development towards renewable energy sources and an increase in technical efficiency.
- Development in producing resource-saving and energy-efficient construction materials.
- Development in the area of mobility, in particular electromobility.
- A social development which favours qualitative added value over quantitative growth.

These factors lie outside of the influence of the SIA. In contrast, the aim of the Energy Efficiency Path is to create the best possible preconditions for achieving targets for the building sector; the course should be set in such a way that the structural development proceeds in big steps in the right direction. As the most important sector in Switzerland in terms of energy consumption, the building sector takes on a pioneering role here, showing that it is already possible to embark on the path towards the 2000-Watt Society today. It is up to developers and investors to integrate the objective of the 2000-Watt Society in the phase of strategic planning. Structures which have already been realised according to the SIA Energy Efficiency Path show that achievement of the goal is not only feasible and affordable, but also allows the necessary freedom in terms of architecture and urban planning to react to project-specific circumstances using creative and appropriate means. Thanks to the overall energetic view, it is also possible to enable existing buildings of cultural value to achieve these goals.

With the Technical Specification SIA 2032 *Graue Energie von Gebäuden* (Embodied energy of buildings) and the new edition of the Technical Specification SIA 2039 *Mobilität – Energiebedarf in Abhängigkeit vom Gebäudestandort* (Mobility – energy use depending on the location of the building) basis has been provided for calculating energy use in these two important areas according to generally accepted and comparable methods. The two areas embodied energy and mobility are given equal consideration along with the energy required for operation. The documentation SIA D 0258 documents the background of this Technical Specification, how it relates to the objectives of the 2000-Watt Society, and the feasibility using case studies.

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