Technical Specification

2040

SIA Energy Efficiency Path

schweizerischer
ingenieur- und
architektenverein

société suisse
des ingénieurs et
des architectes

società svizzera
degli ingegneri e
degli architetti

swiss society
of engineers and
architects

selnaustrasse 16
postfach
ch-8027 zürich
www.sia.ch

Price category: 20

Edition 2011

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2011-06 1st Edition

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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 CO_2 equivalent per person and year. This Technical Specification and the associated documentation SIA D 0236 (2011 edition) [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 the three building categories Residential, Office and Schools.

Due to their impact on climate, greenhouse gas emissions are an important environmentally relevant factor, as the ETH Board emphasises in its paper Switzerland's *Contribution to the Future of Energy* [3]. 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. They have therefore been included in this new edition of the SIA Energy Efficiency Path as a second assessment criterion.

The objective of the 2000-Watt-Society is extremely ambitious. Social and economic influencing factors will play a decisive role in achieving the intermediate goal of the 2000-Watt-Society within the building sector by the year 2050. 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 Residential, Office and Schools 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 practice.
- 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 targets (e.g. in the renovation of listed buildings), greenhouse gas emissions and the primary energy content of the Swiss electricity mix will need to be significantly reduced.

Only if these conditions become a reality can the intermediate goal of the 2000-Watt-Society be achieved with the target values postulated in this information sheet.

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 achievement of the targets for the building sector; the idea is to set a course for the future which ensures that developments in the area of building keep moving 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. Pioneering buildings which have already been realised show that achievement of the goal is not only feasible and affordable, it also allows the necessary freedom in terms of architecture and urban planning to react to project-specific circumstances using creative and appropriate means.

With the publication of the Technical Specifications SIA 2032 *Embodied Energy* of Buildings and SIA 2039 *Mobility – Energy Use depending on the Location of the Building*, for the first time a 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 calculation of the total energy balance and the corresponding greenhouse gas emissions in accordance with this Technical Specification allows the comparison of a project value with the target values contained in this Technical Specification. This Technical Specification can thus be used for project optimisations.

The documentation SIA D 0236 *Documentation on the SIA Energy Efficiency Path* (2011 issue) documents the background to this Technical Specification and how it relates to the objectives of the 2000-Watt-Society. This documentation also includes measures which need to be taken in order to achieve the target values.

Commission SIA 2040

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Approval and validity

The SIA's Central committee for codes and regulations approved this Technical Specification SIA 2040 on 1 March 2011.

It is valid as from 1 August 2011.