

## Low Carbon Buildings Approved proxies for “top 15%”



Switzerland

### Building Performance in Switzerland (13 April 2021)

#### Building Code

- State (canton) dependent
- SIA (Swiss Engineer and Architects) standards based on the EU building standards are what the states base their building codes on
- MoPEC 2014 (energy efficiency code), which aims to
  - Include only requirement that have a significant effect on energy use
  - Prescribe targets rather than procedures
  - Develop on requirements that are applicable
  - Define measurable legal requirements
- Allow for states some room to tailor the code to suit from the federal government towards near zero energy buildings by 2050 has been created to be consistent with the SIA standards with cantons expected to start integrating it in their building code from 2018 and fully implemented by 2020

MoPEC 2014 final energy index limit (heating, hot water and ventilation):

- 35 kWh/m<sup>2</sup>/y (new)
- 60 kWh/m<sup>2</sup>/y (reno)

From the study “energy certificate for Buildings methods and applications”<sup>1</sup>, the primary energy index for reference building based on the standards SIA 380/1(2007) and SIA 380/4(2006) is as presented in the table below

	Building type	Standard for heating (MJ/m <sup>2</sup> )	Standard for other presentations <sup>1</sup> (MJ/m <sup>2</sup> )	Global Standard (MJ/m <sup>2</sup> )
I	Multi-residential	160	410	<b>570</b>
II	Single dwelling	220	320	<b>540</b>
III	Administrative	170	280	<b>450</b>
IV	Schools	180	160	<b>340</b>
V	Commercial	130	400	<b>530</b>
VI	Restaurants	240	670	<b>910</b>
VII	Assembly Halls	210	260	<b>470</b>
VIII	Hospitals	170	450	<b>620</b>
IX	Industrial	150	220	<b>370</b>
X	Storage	130	70	<b>200</b>
XI	Sport facilities	150	530	<b>680</b>
XII	Covered pools	180	1060	<b>1240</b>

1) Other prestations include hot water, ventilation, cooling, lighting except for heating

<sup>1</sup> [Le certificat énergétique des bâtiments, méthodes et applications](#)

primary energy index based on SIA 380/1(2007) and SIA 380/4 (2006)<sup>2</sup>

The MoPEC final energy index is lower than that for just heating based on SIA standards (44kWh/m<sup>2</sup>/y), so it is safe to assume that the MoPEC limits are lower than that of the SIA standards.

## Minergie

- 3 standards: Minergie A, Minergie P and Minergie
- There is a minimum threshold that must be met for all requirements
- All certified buildings are to meet a minimum index ((total weighted final energy index taking into account:
  - Heating, ventilation, air conditioning
  - Hot water.
  - Lighting.
  - Appliances.
  - Technical systems.
- 2 additional standards can be added to any of the 3 Minergie standards:
  - Eco (health and sustainable construction)
  - SQM construction (additional demand on construction quality)
- Issued based on design data
- The standards were all updated to be inline with MoPEC from Jan 2018
- an independent study showed that a new MoPEC building performed about the same or better than a Minergie certified building

**Table 1: Energy performance gap per building standard in new buildings.**

<b>New building standard</b>	<b>Number of buildings</b>	<b>Mean consumption [kWh/(m<sup>2</sup>y)]</b>	<b>Median consumption [kWh/(m<sup>2</sup>y)]</b>	<b>Mean EPG [%]</b>	<b>Median EPG [%]</b>
MoPEC 2014	5	38	30	6.9	-15
Minergie	5	41	33	15	-6.8
Minergie-P	14	29	29	-11	-12
Minergie-A	4	30	30	-15	-16

Energy performance gap per building standard in new buildings <sup>3</sup>  
 (Study does not specify version of certification buildings selected are rated under, however states that the buildings selected were recently built or renovated so the 2017 version is assumed)

<sup>2</sup> [Le certificat énergétique des bâtiments, méthodes et applications](#)

<sup>3</sup> [Cozza, Stefano & Chambers, Jonathan & Gambato, Carlo & Branca, Giovanni & Geissler, Achim & Patel, Martin. \(2019\). Energy consumption of high-performance buildings: Design vs. Reality. Journal of Physics: Conference Series. 1343. 012169. 10.1088/1742-6596/1343/1/012169.](#)

## Comparison of the 3 Minergie standards

	Minergie	Minergie -P	Minergie -A
PV	At least 10W/m <sup>2</sup> SRE with the increase of energy efficiency	At least 10W/m <sup>2</sup> SRE with the increase of energy efficiency	Covers all energy requirement with the increase of energy efficiency
Thermal insulation	according to MoPEC 2014	30% more than MoPEC 2014	MoPEC 2014 or better
Energy Metering	Compulsory for all large buildings (>2000m <sup>2</sup> )	Compulsory for all large buildings (>2000m <sup>2</sup> )	For all buildings
Outdoor air intake	Automatic	Automatic	Automatic
Air tightness	controlled infiltration	controlled infiltration	controlled infiltration
Fossil fuel	no fossil fuel use for heating and cooling except for offsite heating and cooling sources and peak load	no fossil fuel use for heating and cooling except for offsite heating and cooling sources and peak load	no fossil fuel use for heating and cooling except for offsite heating and cooling sources and peak load
Hot water	Reduce energy demand for water heating	Reduce energy demand for water heating	Reduce energy demand for water heating
Lighting	Lighting efficiency according to code	Lighting efficiency according to code	Lighting efficiency according to code
Minergie index (total weighted final energy requirement)	- 55 kWh/m <sup>2</sup> /y (new) - 90 kWh/m <sup>2</sup> /y (reno) and conform with the heating requirements from MoPEC 2014	- 50 kWh/m <sup>2</sup> /y (new) - 80 kWh/m <sup>2</sup> /y (reno) and conform with the heating requirements from MoPEC 2014	- 35 kWh/m <sup>2</sup> /y (new) - 35 kWh/m <sup>2</sup> /y (reno) and conform with the heating requirements from MoPEC 2014
Final energy index (as per MoPEC)	- 38 kWh/m <sup>2</sup> /y (new) - 55 kWh/m <sup>2</sup> /y (reno)	- 30 kWh/m <sup>2</sup> /y (new) - 50 kWh/m <sup>2</sup> /y (reno)	35 kWh/m <sup>2</sup> /y

	Minergie	Minergie -P	Minergie -A
		<ul style="list-style-type: none"> <li>- The -P standard aims for a optimum insulation with an energy demand as low as possible by using passive heating</li> <li>- Building envelope performance to be at least 30% better than MoPEC 2014 with special attention to thermal insulation in summer</li> <li>- Lower energy index, electricity should be self-generated though exceptions are allowed. Consumed self-generated electricity can be deducted from consumption, electricity fed back into the grid is partially deducted.</li> <li>- The -P standard aims for a 2000W society</li> </ul>	<ul style="list-style-type: none"> <li>- Positive energy balance (self-generated electricity can be deducted from consumption, electricity fed back into the grid is partially deducted)</li> <li>- No restriction on design as long as energy use index is met</li> </ul>

The information provided by Minergie shows that the heating demand limit for Minergie and Minergie -P are both are under the SIA standard (90% and 60% respectively). From the 2017, Minergie was aligned with MoPEC and Minergie -P 70% of the MoPEC requirement.

According to the email from Minergie, about 8% of buildings built since 1998 was certified under Minergie. According to the government website <https://www.bfs.admin.ch/bfs/en/home/statistics/construction-housing/buildings.html>, the Swiss residential building stock was at 1,756,927, while the Minergie website states that there are 44,247 certified residential buildings showing a 2.5% certification rate.