



Are BIPV compatible with buildings from different construction periods?

Renovation projects with BIPV are an efficient way to achieve the Energy Strategy 2050 targets [cf. sheet 3.1]. Here, we illustrate how BIPV renovation strategies are compatible with buildings from different construction periods and typologies.

The construction period mainly defines the actual status of a building, i.e., its current energy performances and improvements needed. Based on this, the BIPV strategy will range from lightest to heaviest [cf. sheet 2.3]. We conclude that BIPV renovation projects are relevant not just for a specific construction period or type, but for a wide palette of buildings in the Swiss context.

Keywords: BIPV architectural integration; Renovation project; Construction period.

Target audience: Regulation makers; Owners & other decision makers; Architects & engineers; Suppliers & companies.

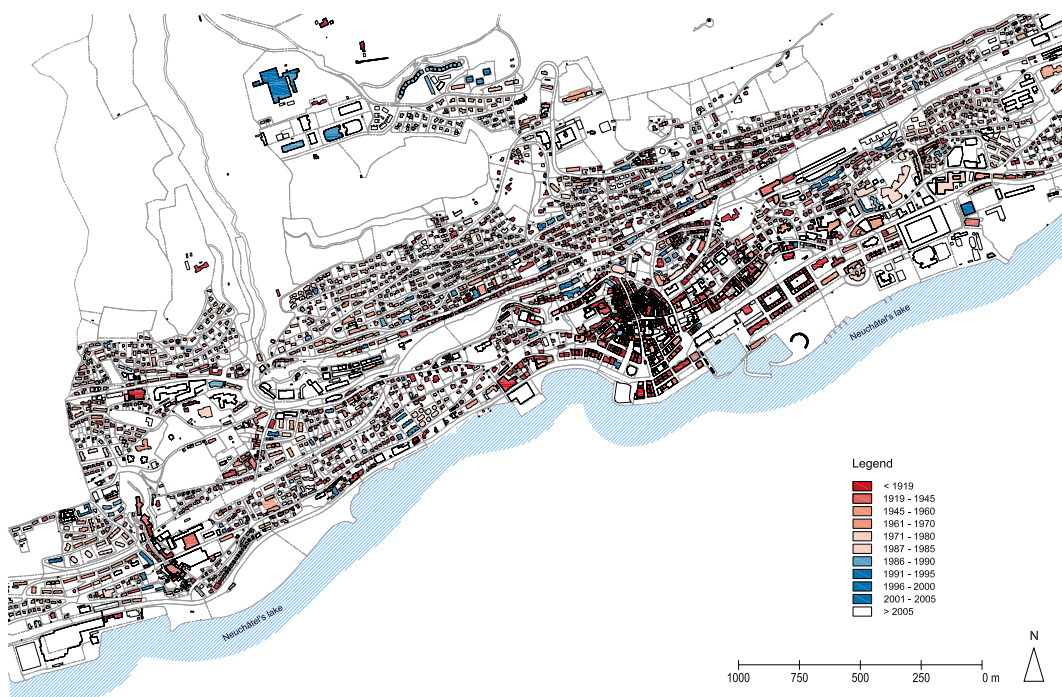


Fig. 1 Geo-data on the spatial disposition based on construction period for the city of Neuchâtel, data from 2015 [1] (©EPFL-LAST).

The project demonstrates that renovation strategies with BIPV are a lever to activate urban renewal processes for a whole series of buildings from varying periods of construction, and not just for a specific type of building or construction period. Therefore, the approach begins by identifying five residential archetypes within the building stock of the City of Neuchâtel, which is representative of the Swiss residential building stock [1].

Fig. 1 shows geo-data on the spatial disposition for the construction period for residential buildings built before 1919 until 2005 [2]. The number of residential buildings built until 2005 and their equivalent floor area led to a total of 3,017 buildings with 3,650,921 m² of floor area.





















	Arch. 1	Arch. 2	Arch. 3	Arch. 4	Arch. 5
A - Construction period	before 1919	1919-1945	1946-1970	1971-1985	1986-2005
B - Urban context	 Isolated	 Isolated	 Isolated	 Isolated	 Isolated
C - Roof potential	 Sloped	 Sloped	 Flat	 Flat	 Flat
D - Façade potential	 5-7 floors	 1-4 floors	 5-7 floors	 > 7 floors	 5-7 floors
E - Architectural quality (heritage)	Typical II	Typical II	Typical II	Typical II	Unattractive III
Address	 Rue de Beaugard 1	 Rue du Rocher 25	 Rue du Chasselas 2-6	 Rue des Troncs 12-14	 Route de Pierre-à-Bot 34

Fig. 2 Definition of five archetypal situations according to selection criteria A-E [1] (©EPFL-LAST).

The top-down analysis presented in this summary sheet serves to further an understanding of the residential building stock of the city of Neuchâtel and to define representative residential archetypes based on five selection criteria A-E (Fig. 2) [3]. Subsequently, a relevant case study is selected for each archetype. These real case studies are crucial for the development of BIPV renovation strategies [cf. sheet 2.3].

Since buildings considered typical (classified as category II or III according to the Architectural Heritage Service of Neuchâtel) can be found in any Swiss Plateau city, focusing on these buildings ensures the potential for application of the research results in other contexts, conditional to considering the particularities of the project in question.

Each archetype, defined by its period of construction, urban context, type of roof, type of facade and level of heritage protection, requires different intervention strategies depending on the design objective from an architectural point of view and considering the sensitivity of the context in which it is located [cf sheet 2.3].

References

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