STEP-BY-STEP RETROFITTING TO PASSIVHAUS STANDARD

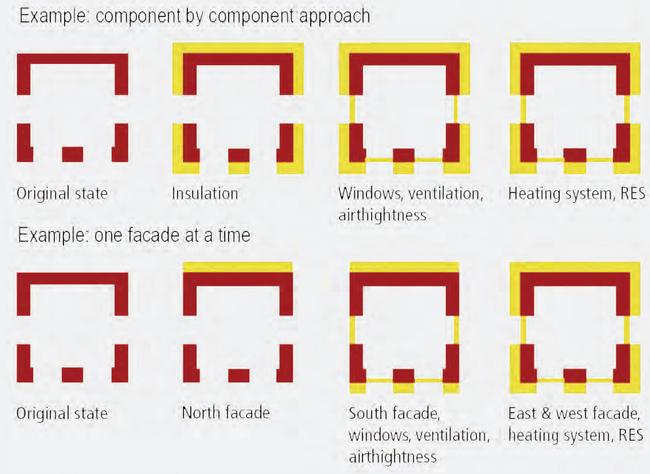
OF A HOTEL-RESTAURANT IN NORTHERN ITALY

M. Larcher[1], F. Ferrario[1,2], I. Iannone[1], D. Casagranda[2], Francesco Nesi[1]

1 ZEPHIR s.r.l. – Passivhaus Italia, Loc. Fratte 18/3 - 38057 Pergine Valsugana (TN), Italy

2 Armalam srl., Viale Dante 300 - 38057 Pergine Valsugana (TN), Italy

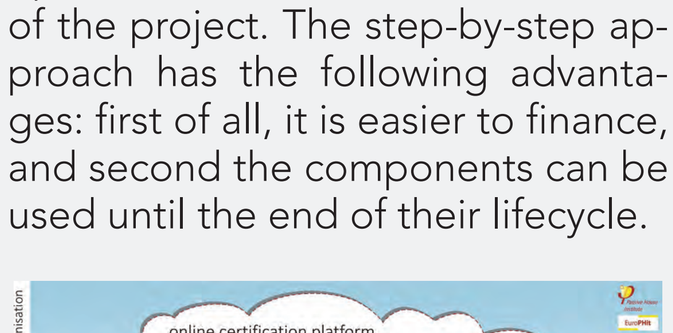
The concept of step-by-step retrofitting is being developed within the European Project EuroPHit and it consists in refurbishing a building bringing it to the Passivhaus standard in different phases that can be implemented at a distance of years.



Possible approaches to a step-by-step retrofit: component by component (top image) and one facade at the time (bottom image)

Source: PHI

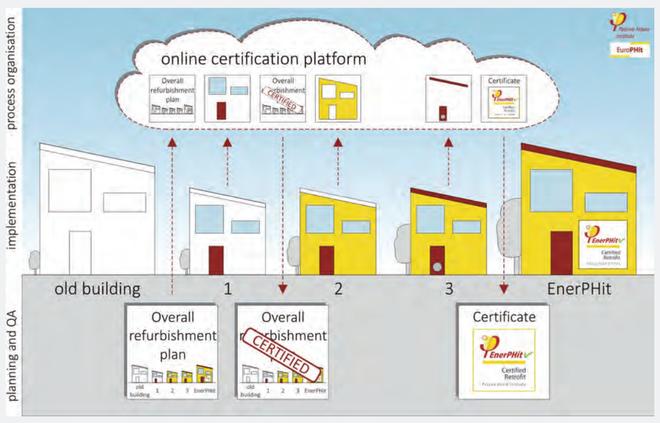
The different steps can involve the retrofitting/replacement of single components of the building or the retrofitting of single parts of the building. The main idea behind this innovative approach is to set up, from the beginning, an overall refurbishment plan (ORP), that will guide the retrofit through the different steps.



Typical example of step-by-step detail at the window-wall connection.

Source: MosArt

Therefore it includes all the steps that bring the existing building to a nZEB. The ORP is of fundamental importance in order to avoid building physics issues, elaborate connection details of components that are replaced in different steps and optimize the economic convenience of the project. The step-by-step approach has the following advantages: first of all, it is easier to finance, and second the components can be used until the end of their lifecycle.

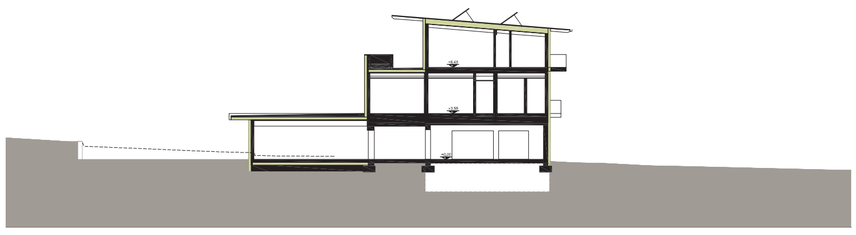


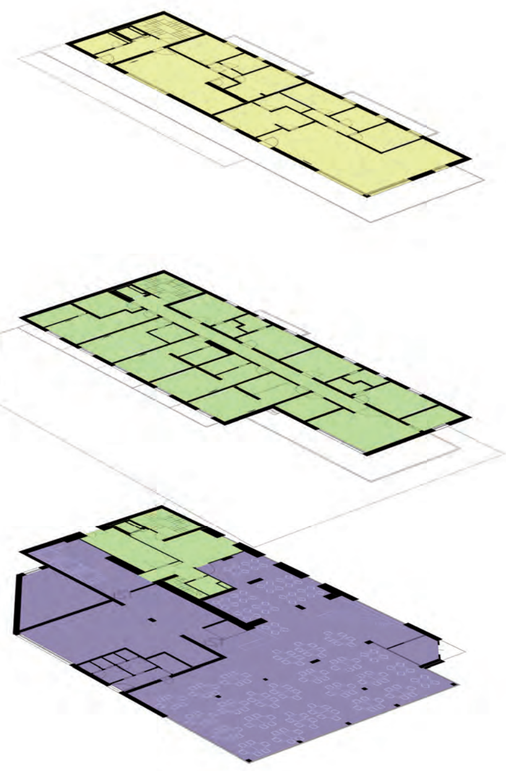
Schematic representation of a step-by-step retrofit with the associated certification process.

Source: PHI

The Hotel-Restaurant Valcanover, located in Northern Italy, represents the first hotel-restaurant worldwide that is step-by-step retrofitted to the Passivhaus standard. The existing building is a masonry construction and its treated floor area is 590 m^2. The main project challenges are the thermal insulation of the floor slab, due to limited height of the ground floor ceiling, the limitation/removal of the internal heat loads of the restaurant and the fact that the building contains three different destination of use, hotel, restaurant and residential, that need to be refurbished in different steps. The first step, that will be implemented in autumn 2015, consists in retrofitting the existing masonry construction at the ground floor, improving considerably the thermal envelope and the building services, and in realizing an extension in cross laminated timber. In the following 2 steps, that will be implemented in autumn 2016 and 2017, the upper part of the building will be demolished and reconstructed in cross laminated timber following the Passivhaus principles.

Orthophoto





East view of the existing building

East view of the refurbished building

South - east view of the existing building

South - east view of the refurbished building

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