



# Development of European Ecolabel Criteria for Buildings

## BUILDING LCA

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## 44 Study Cases of Building LCA

**BUILDING RESTRUCTURE**  
 'Corviale' popular building Roma(2 studies)  
 Slaughter house of Reggio C.  
 Slaughter house of Spilimbergo (Modena)  
 Buildings by crude earth (Abruzzo)  
 Working-Class Houses (Messina)  
 Federico II University (NA)  
 ENEA Office (Bologna)  
 Vigo palace (Catania)  
 Social Center (Catania)  
 House in Luserna (Torino)

**PLANT RESTRUCTURE**  
 Office (Torino and ENEA Bologna)  
 Plants of 'Villa Monna Tessa' Hospital (FI)  
 Plants of 'Corviale' building

**BRICK PRODUCTION**  
 Poroton and Poroterm bricks  
 ANDIL bricks  
 Floor-tile gres

**FIXED AND REMOVAL BUILDING COMPARISON**  
 House for emergencies  
 Bathing building and 'Trabocco

**BUILDING PROJECT**  
 House in Bologna  
 Center for sale Volkswagen  
 Kindergarten of Ramacca (Catania) (2 studies)  
 Student house of Messina University (2 studies)  
 Great hall of Bologna University  
 Kindergarten of Castelfranco E. (MO)  
 Museum of Cosenza  
 Primary School of S.Giovanni in Persiceto (BO)  
 House for elderly people (Bari)  
 Family house for young of Lodi  
 Working-Class Houses(Roma)  
 School of Longone Sabino (Rieti)  
 SICEP Shed (Catania)  
 Passiv house (Vicenza)

**BUILDING LAYERS COMPARISON**  
 External masonry: passiv house  
 External masonry: comparison with ITACA Protocol  
 External masonry and roof covering  
 External masonry of ATER di Rovigo  
 Windows and doors CORMO (S. Martino, RE)  
 Cement tiles (APT-C, Rovigo)

**CITY RESTRUCTURE**  
 Rubattino Quarter (Milano)



## The First Case: Project of a Working-Class House

**Functional Unit**

The building represented by 54 flats of 72 sqm with independent heating during 100 years of life.

**System Boundaries**

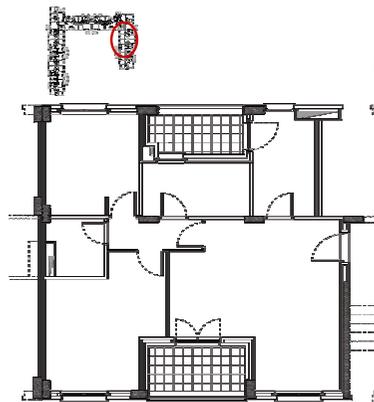
- From resources finding to end of life of building materials.
- Including all materials of building construction with furnitures, electric, thermal and hydraulic plants.
- Including winter and summer energy uses, energy of domestic uses and water use.

**Calculation Code**

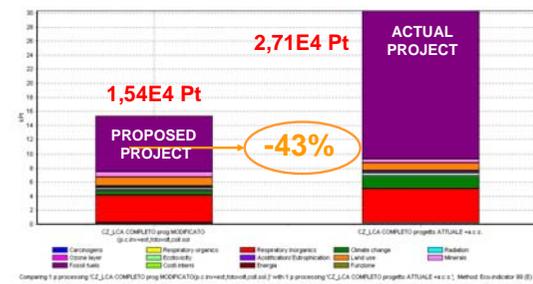
SimaPro

**Method**

Eco-indicator 99



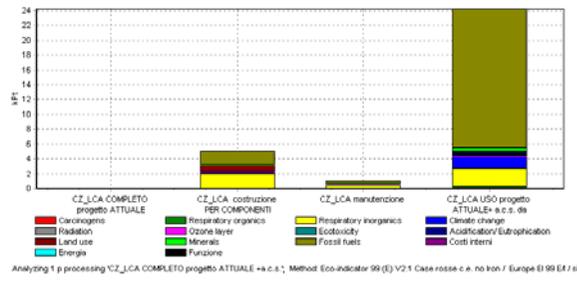
## Comparison LCA : actual Project – proposed Project



Reduction of **total Damage** of 43%  
 Reduction of 29% in **Human Health**  
 Reduction of 59% in **Resources**



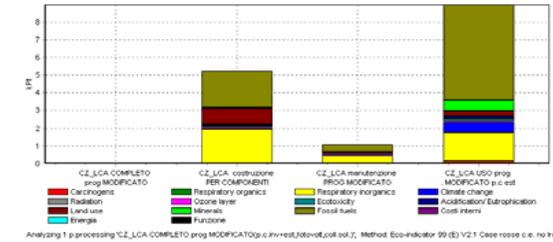
### Building LCA of actual Project



Damage of **Construction** and **End of Life**: 17% of total  
 Damage of **Maintenance**: 3% of total  
 Damage of **Use Energy**: 80% of total



### Building LCA of proposed Project with Reduction of Heat Transmission and Use of photovoltaic and solar Energy



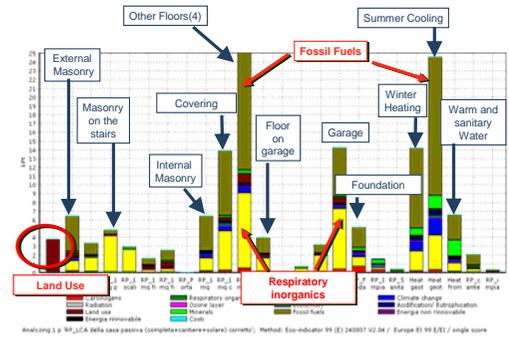
Damage of **Construction** and **End of Life**: 34% of total  
 Damage of **Maintenance**: 7% of total  
 Damage of **Use Energy**: 59% of total



### The second Case: Project of a passive House

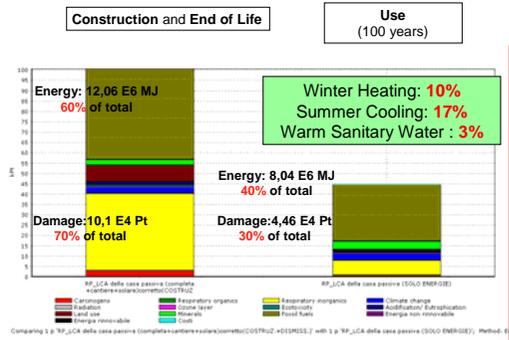


### LCA of a passive House

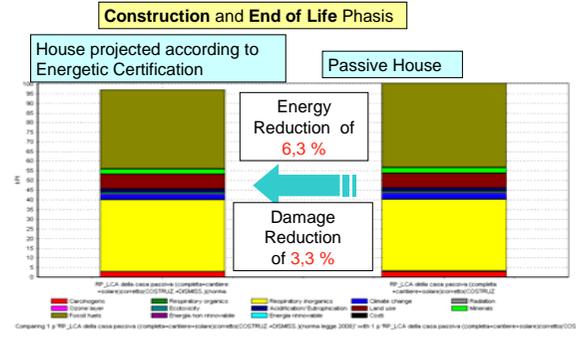




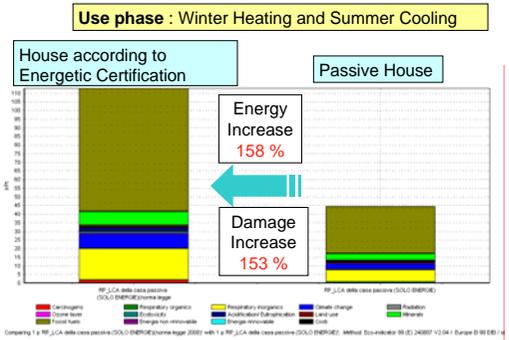
### Comparison among the Life Cycle Phasis



### Comparison between the Passive House and the House projected according to Energetic Certification



### Comparison between the passive House and the House projected according to Energetic Certification



### 3<sup>rd</sup> Case: Building Restructure

#### A Office Flat of Enea Center

