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Klimakit energy retrofit: organizational model and operational tools



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Bolzano, 24.01.2019



Klimakit energy retrofit: organizational model and operational tools



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Klimakit project

Klimakit tools

Klimakit model

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Klimakit project

Klimakit tools

Klimakit model

Klimakit project Framework



Klimakit project

Klimakit Goals



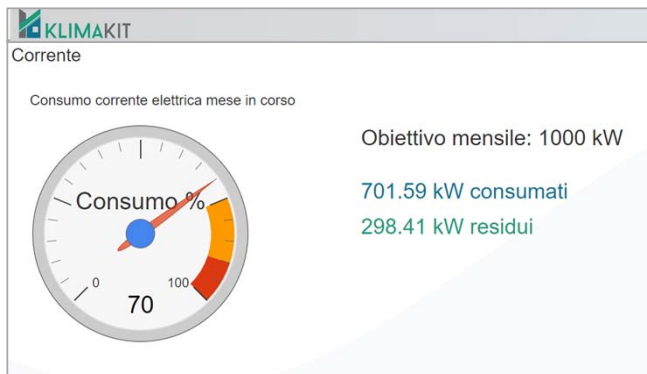
Goal 1 – Professionals and Technicians

1. **Supporting the building and energy sector** of South Tyrol to collaborate for developing energy refurbishment projects

- **Energy performance guarantee**
- **Quality assurance** of the project
- Acceptable **pay back time** (about 10 years)
- **Adequate costs** (retrofit prices should be 15-20% less of the actual costs)

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Goal 2 – Users

2. **Leading the users**, by means of a **user web interface**, toward high level of indoor comfort using the lowest energy rate

- **Showing energy performance indicators** to users to increase their awareness on energy performance and increase indoor thermal comfort
- **Giving behavioral advices** to reduce the energy consumption
- **Notifying to the users of benchmark performance indicators** they should have

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Klimakit Goals



Goal 3 – Public administration

3. **Spurring public administration** into changing the actual legislative framework to allow social housing association to test **innovative models for energy refurbishment**

- **Defining a roadmap** for social housing associations and public administration to support the introduction of new models

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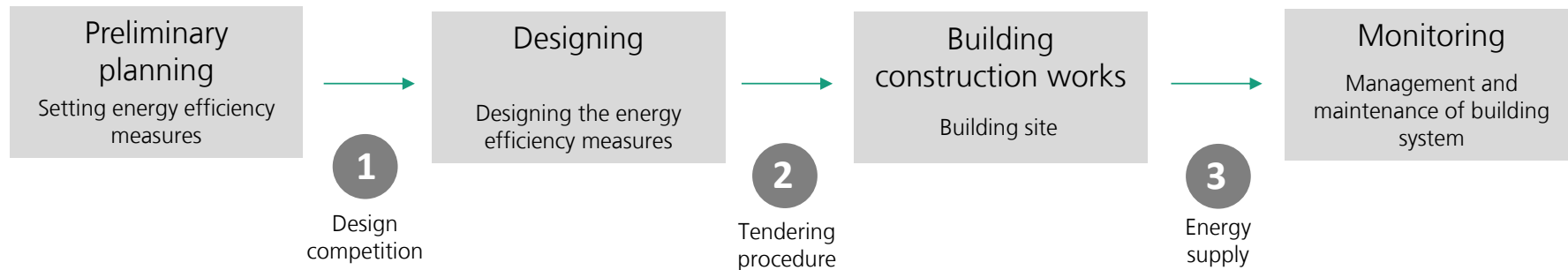
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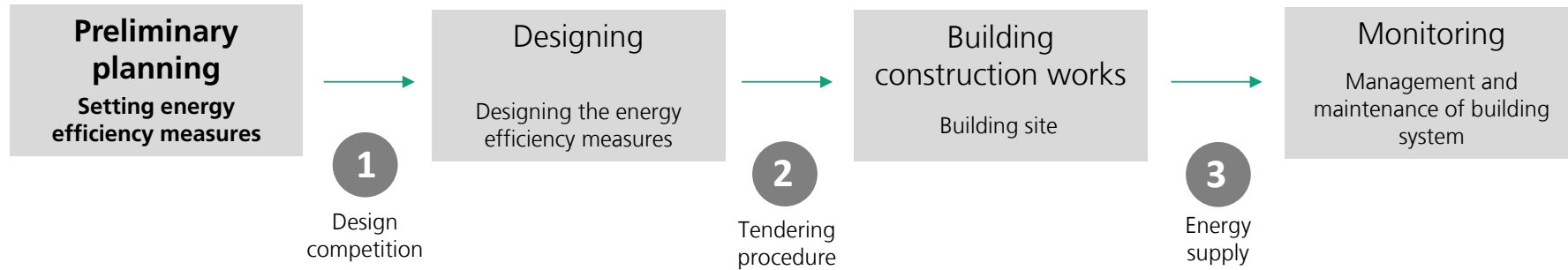
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Critical issues of the energy retrofit process



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Critical issues of the energy retrofit process

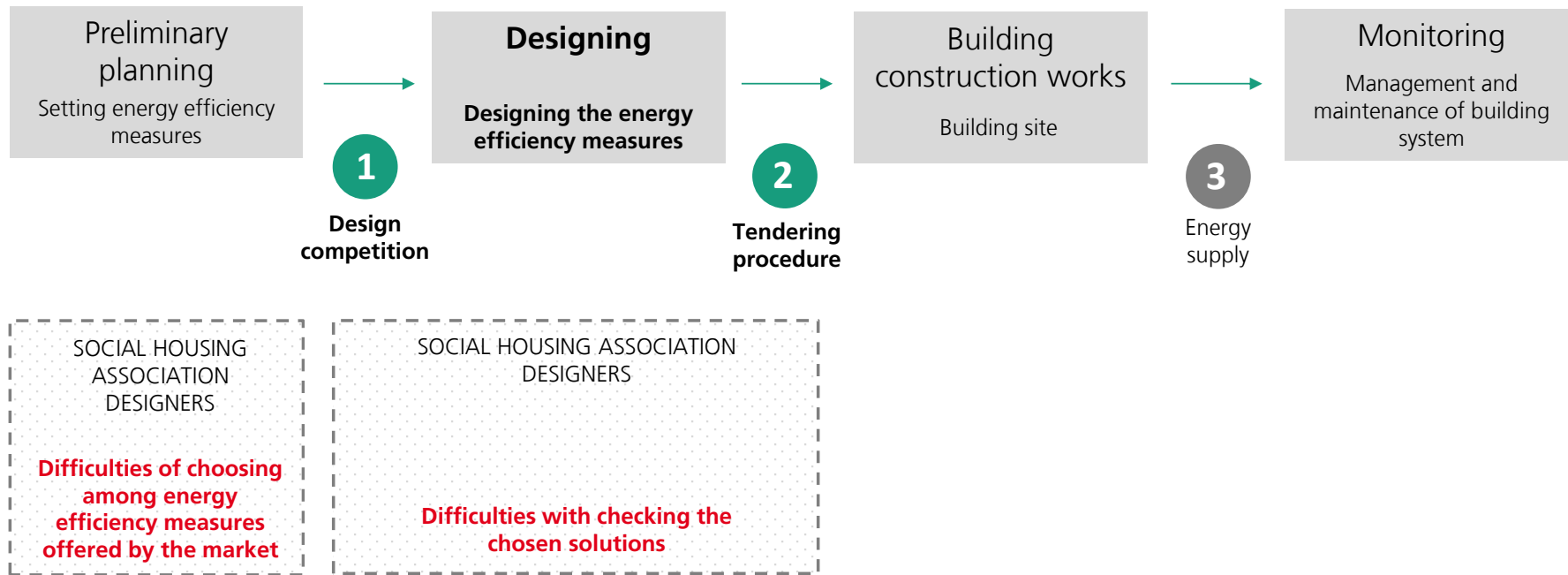


SOCIAL HOUSING ASSOCIATION DESIGNERS

Difficulties of choosing among energy efficiency measures offered by the market

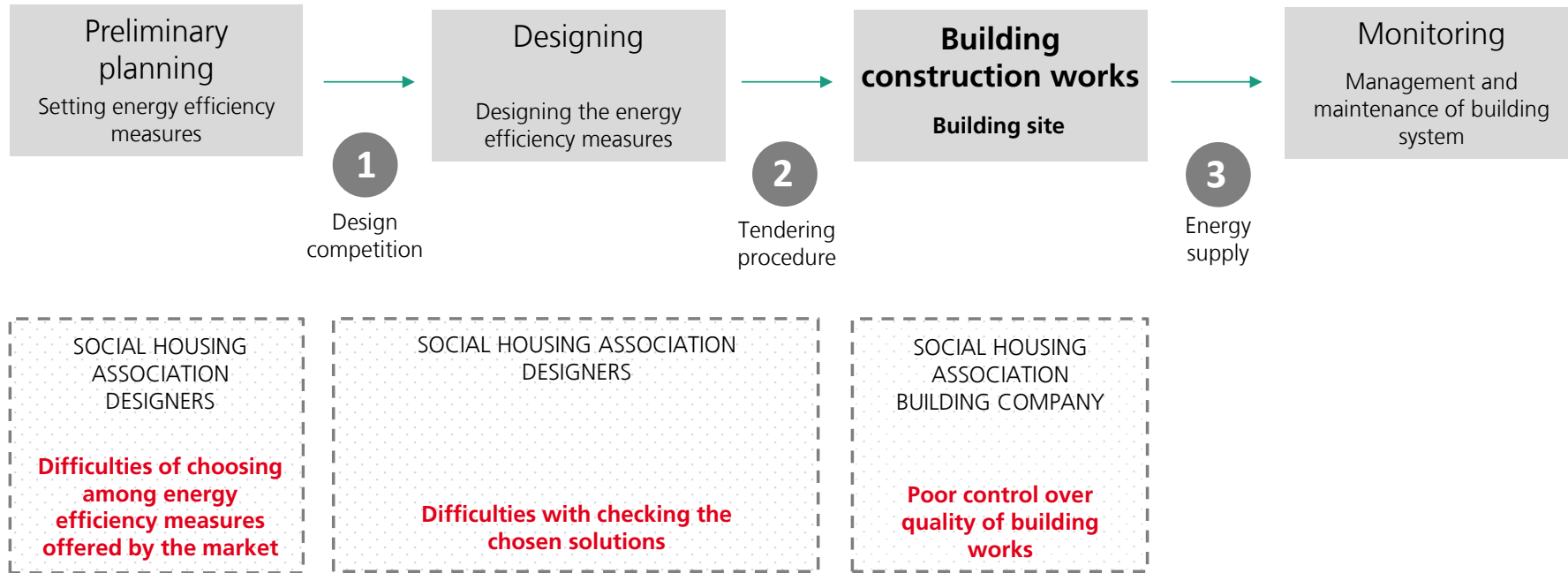
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Critical issues of the energy retrofit process



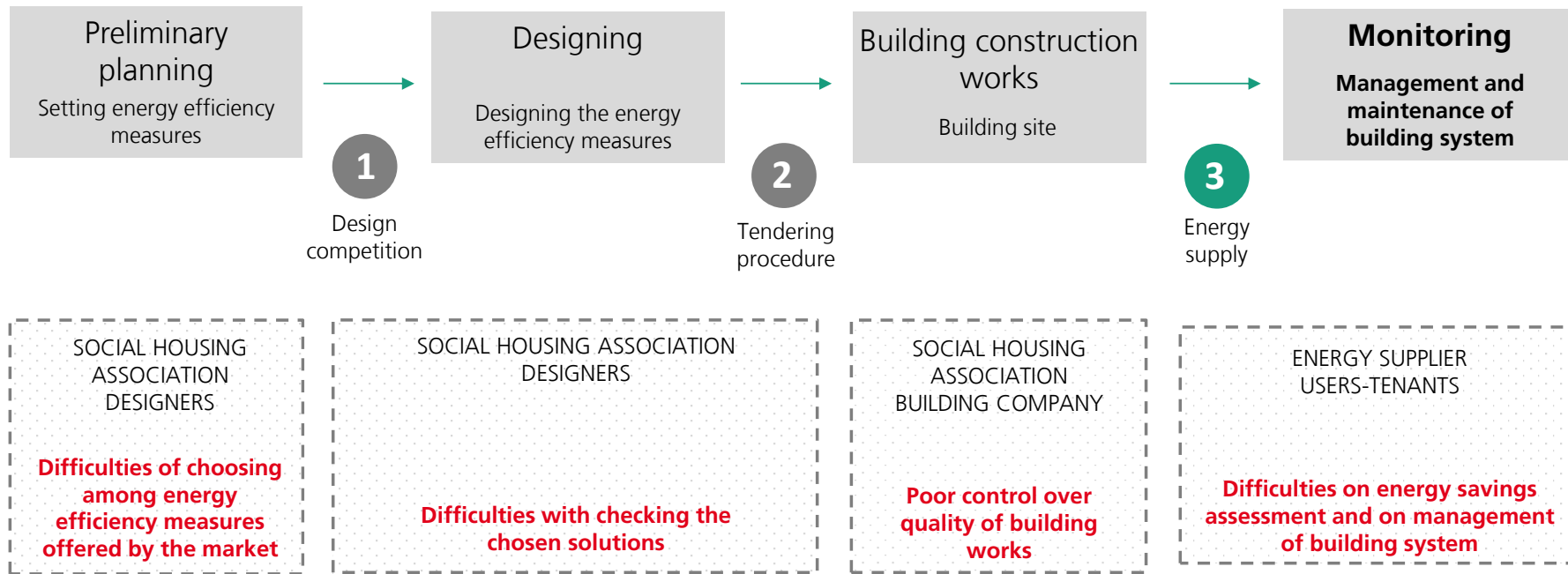
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Critical issues of the energy retrofit process



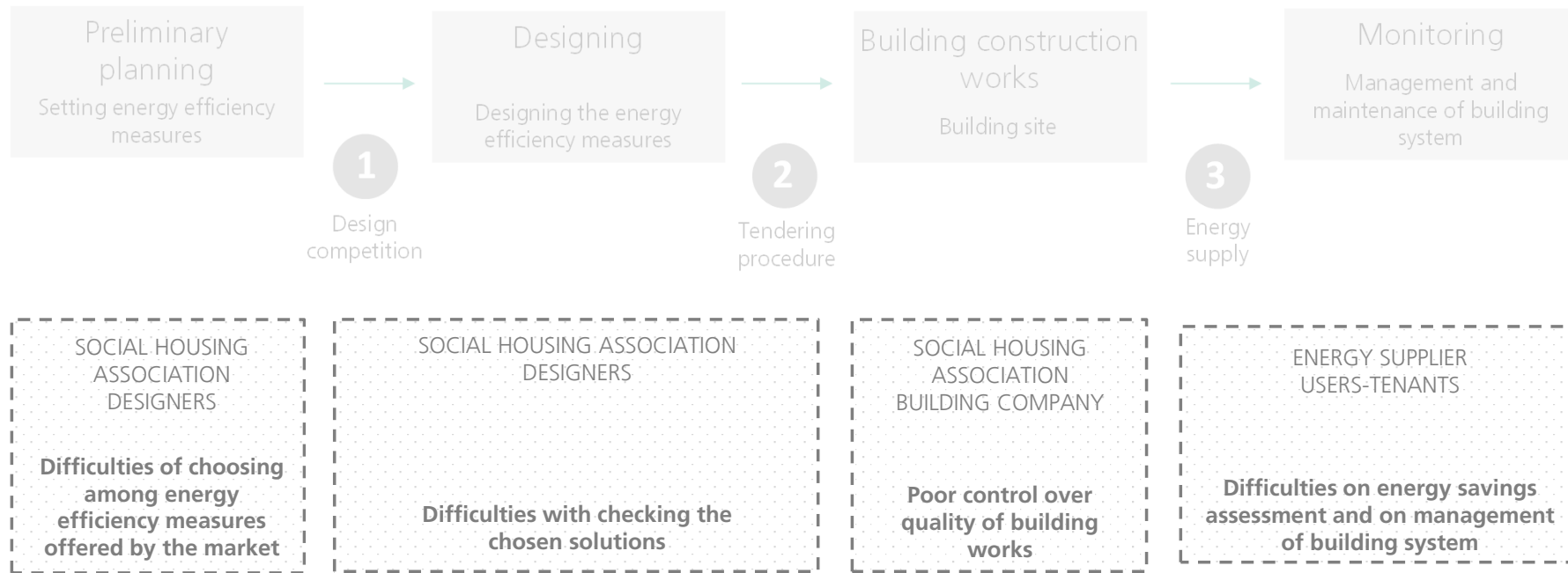
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Critical issues of the energy retrofit process



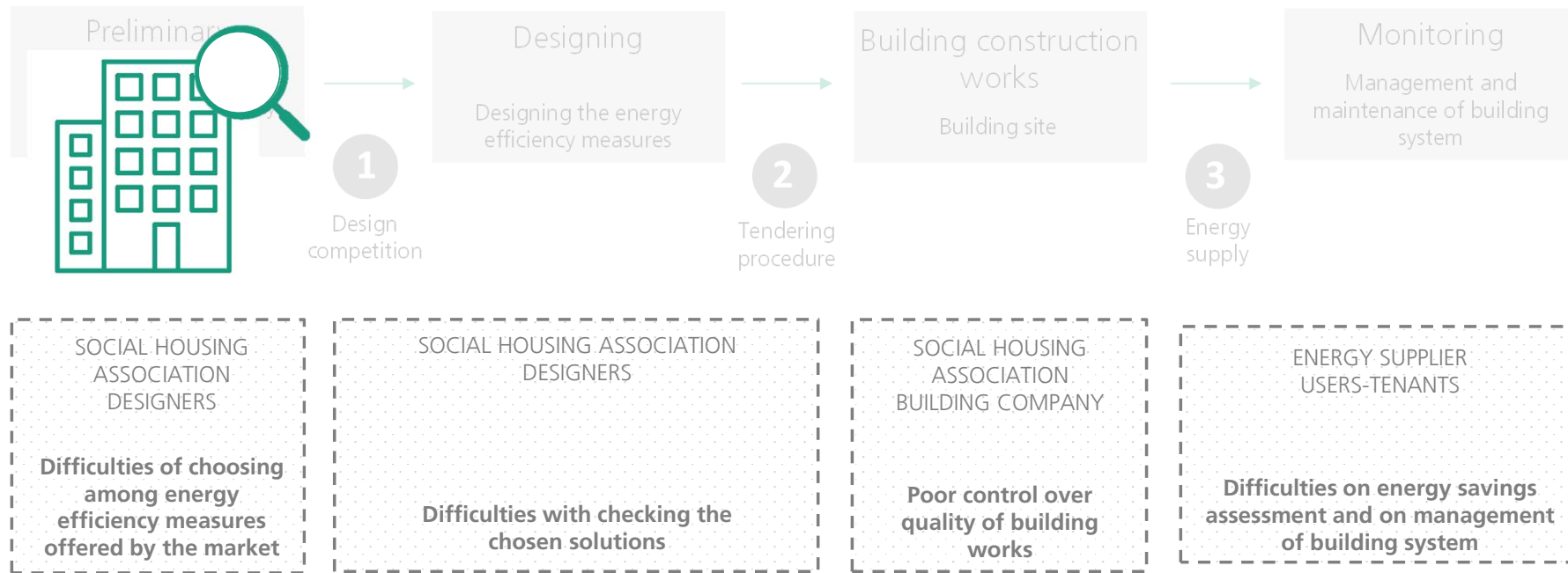
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Critical issues of the energy retrofit process



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Critical issues' solutions



**Tool online:
Analysis Klimakit**

Klimakit tools

Tool online: Analysis Klimakit



ANALISI KLIMAKIT

A. Caratteristiche generali

A.1 Localizzazione
 Comune: Merano
 Zona climatica: E

A.2 Anno di costruzione
 Dal 1976 al 1991: 2

A.3 Tipologia edificio in pianta
 Rettangolare

A.4 Numero piani

A.5 Numero appartamenti

A.6 Superfici

A.7 È presente

A.8 È presente una mansarda non riscaldata?

A.9 Tipologia di copertura
 Tetto a falde

GENERAL FEATURES

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GENERAL FEATURES

A.4 Numero piani: 5

A.5 Numero appartamenti: 10

A.6 Superfici
 Superficie totale: 1000

A.7 È presente un ascensore: Sì

A.8 È presente una mansarda non riscaldata? Sì

A.9 Tipologia di copertura
 Tetto a falde

B. Drivers di intervento

B.1 Intervento di riqualificazione sul singolo appartamento o sull'intero edificio?
 Intero edificio: 2

B.2 È previsto un cambio di inquilini?
 Sì: 1

B.3 Sistema di distribuzione è coibentato?
 Sì

DRIVERS FOR RETROFIT

B.4 La copertura è isolata?
 No

B.5 La caldaia è stata sostituita?
 No

B.6 Esiste un cappotto?
 Sì

B.7 Al Primo solarium?
 Sì

B.8 Alla copertura è applicato isolante?
 Sì: 1

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GENERAL FEATURES

A.4 Numero piani: 5

A.5 Numero appartamenti: 10

A.6 Superfici totali: 1000

A.7 È presente un impianto di riscaldamento? Sì

A.8 È presente una mansarda non riscaldata? Sì

A.9 Tipologia di copertura: Tetto a falde

B. Drivers di intervento

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B.3 Sistema di distribuzione è coibentato?
 Sì

DRIVERS FOR RETROFIT

B.4 La copertura è isolata?
 No

B.5 La caldaia è stata sostituita?
 No

B.6 Esiste un cappotto?
 Sì

B.7 Al Primo solarium è applicato un impianto fotovoltaico?
 Sì

B.8 Alla copertura è applicato isolante?
 Sì: 1

C. Energia

C.1 Classe di efficienza dell'involucro
 E: 1

C.2 Tipologia di impianto di riscaldamento
 Autonomo: 1

ENERGY SYSTEM

C.3 Sistema di generazione
 Caldaia a gas

C.4 Tipologia di impianto
 Centralizzato

C.5 Sistema di generazione
 Caldaia a gas

C.6 È disponibile un impianto fotovoltaico?
 No

C.7 Esiste un impianto fotovoltaico?
 No

C.8 Superficie disponibile in copertura: - m²

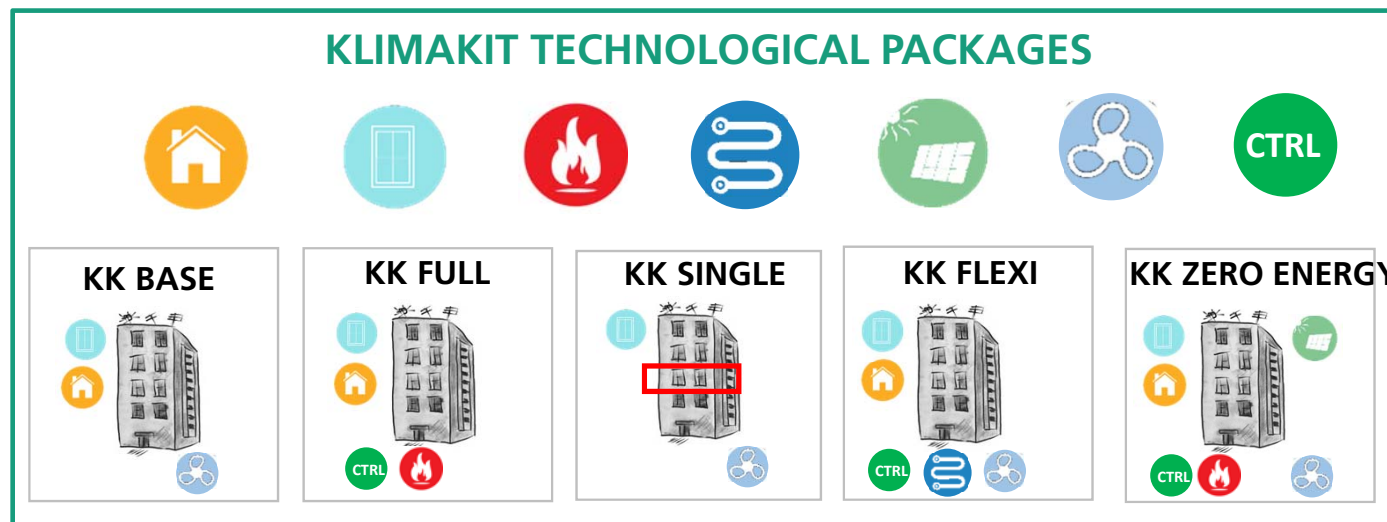
C.9 Superficie disponibile sulla facciata sud: - m²

C.10 Superficie disponibile sulla facciata est: - m²

C.11 Superficie disponibile sulla facciata ovest: - m²

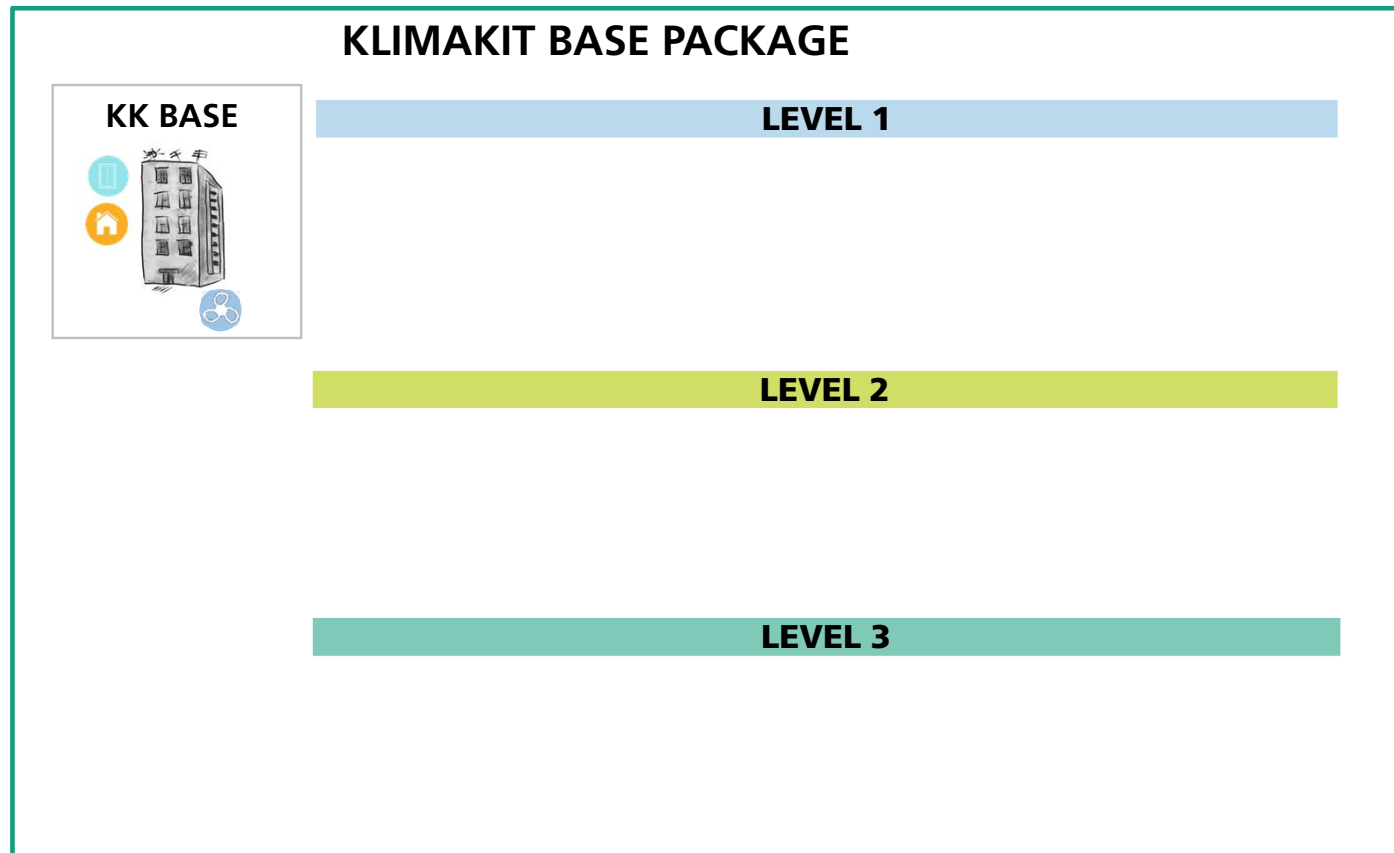
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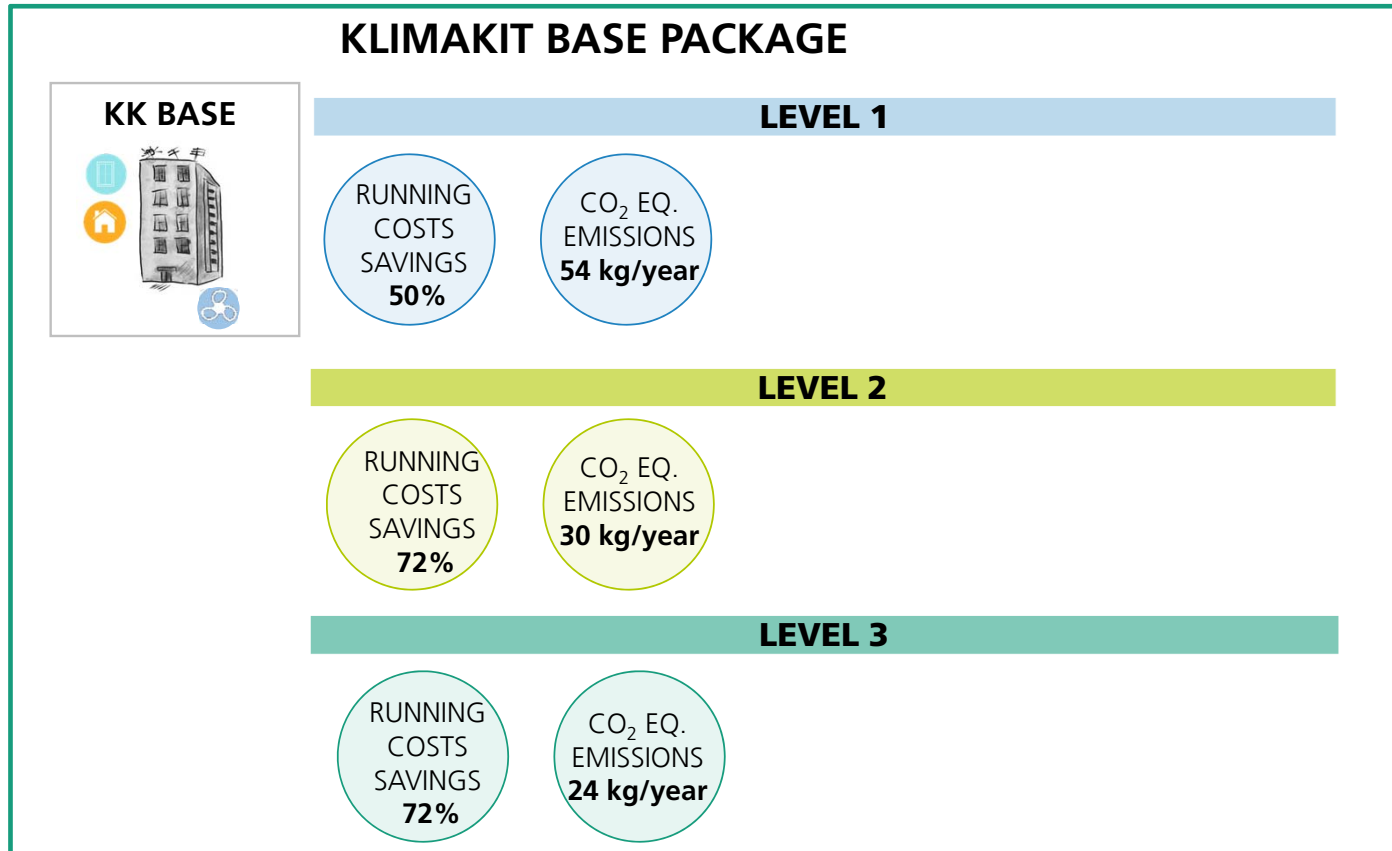
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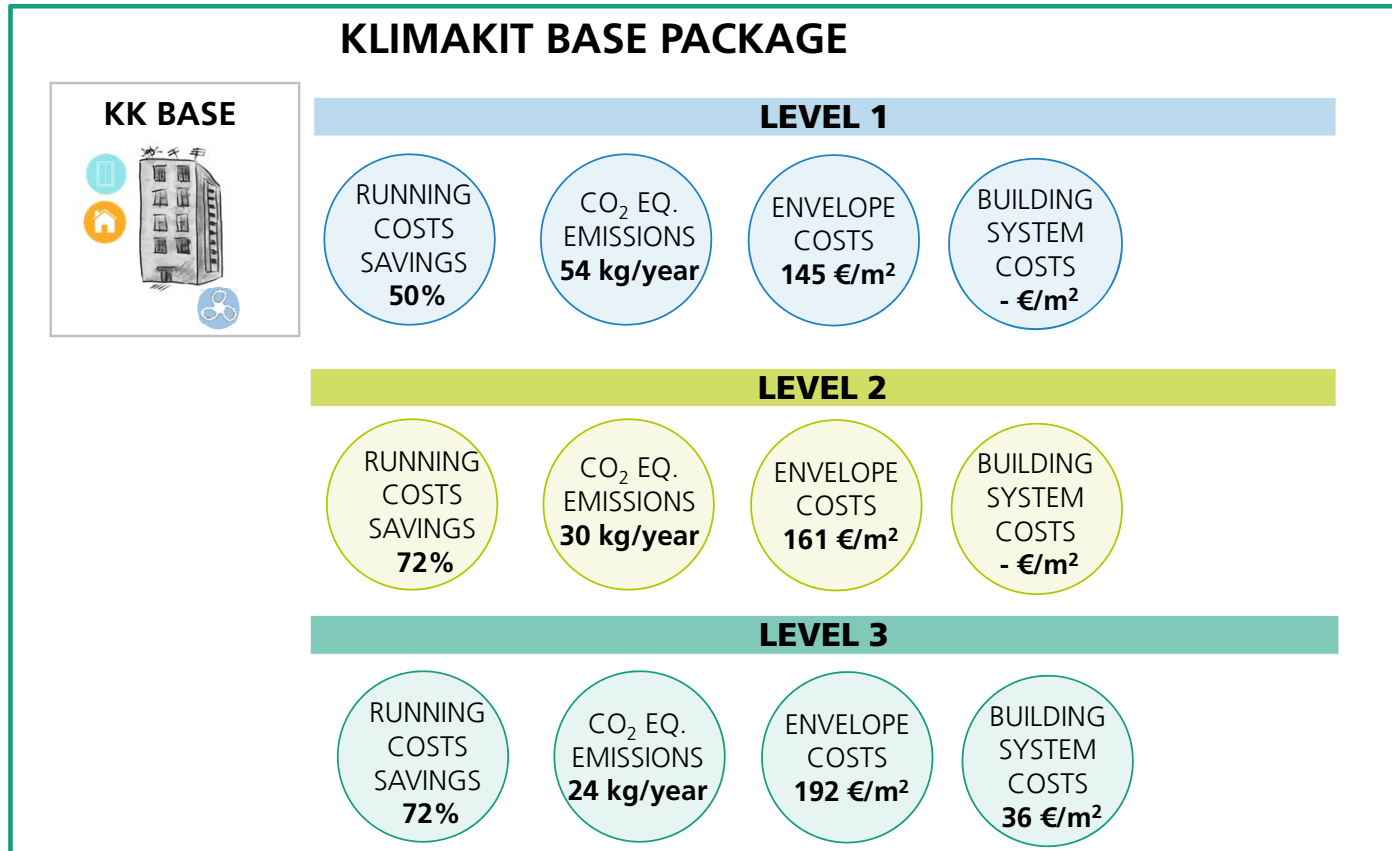
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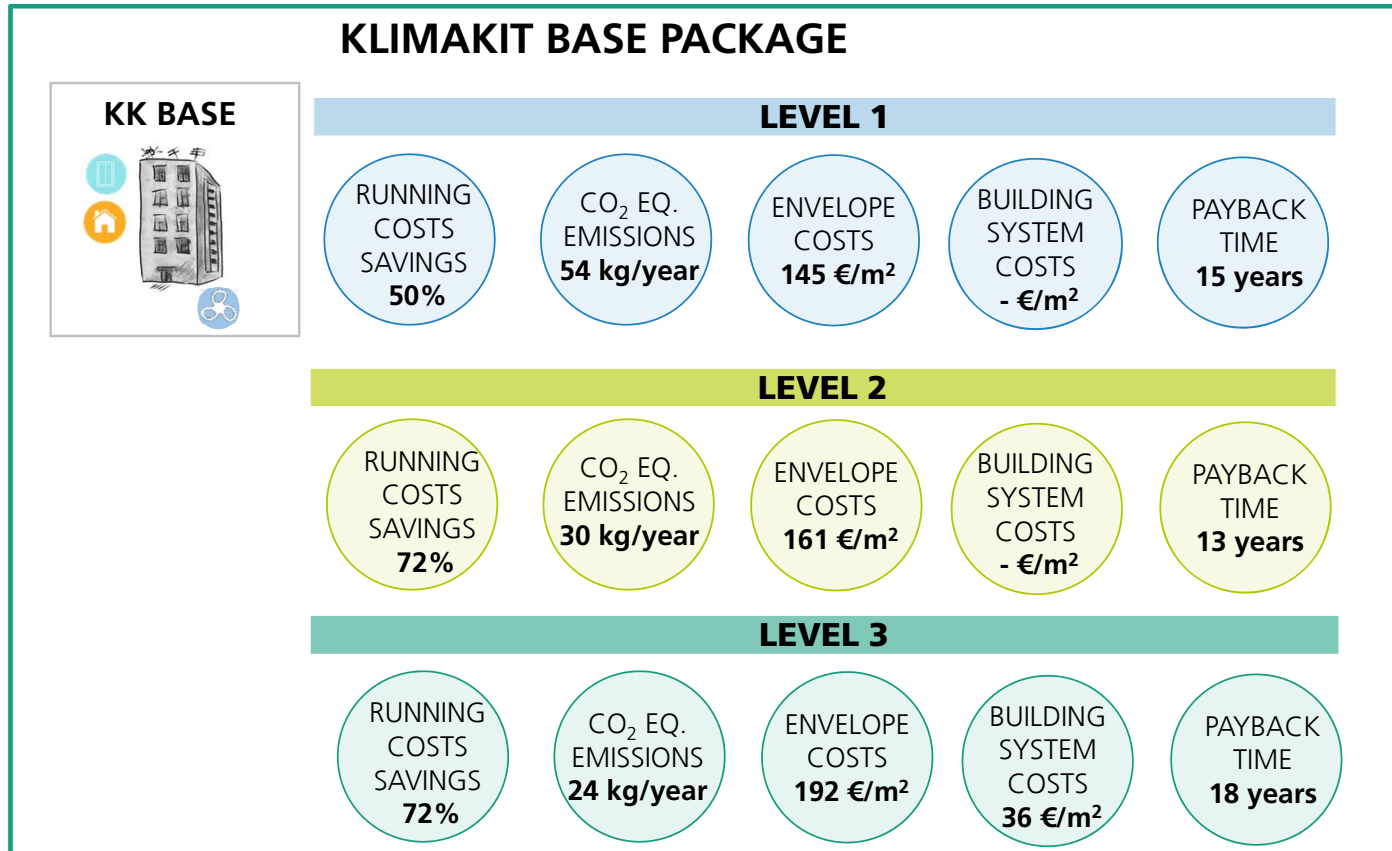
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Critical issues' solutions



Tool online: Analysis Klimakit **Soft criteria for tendering procedure**

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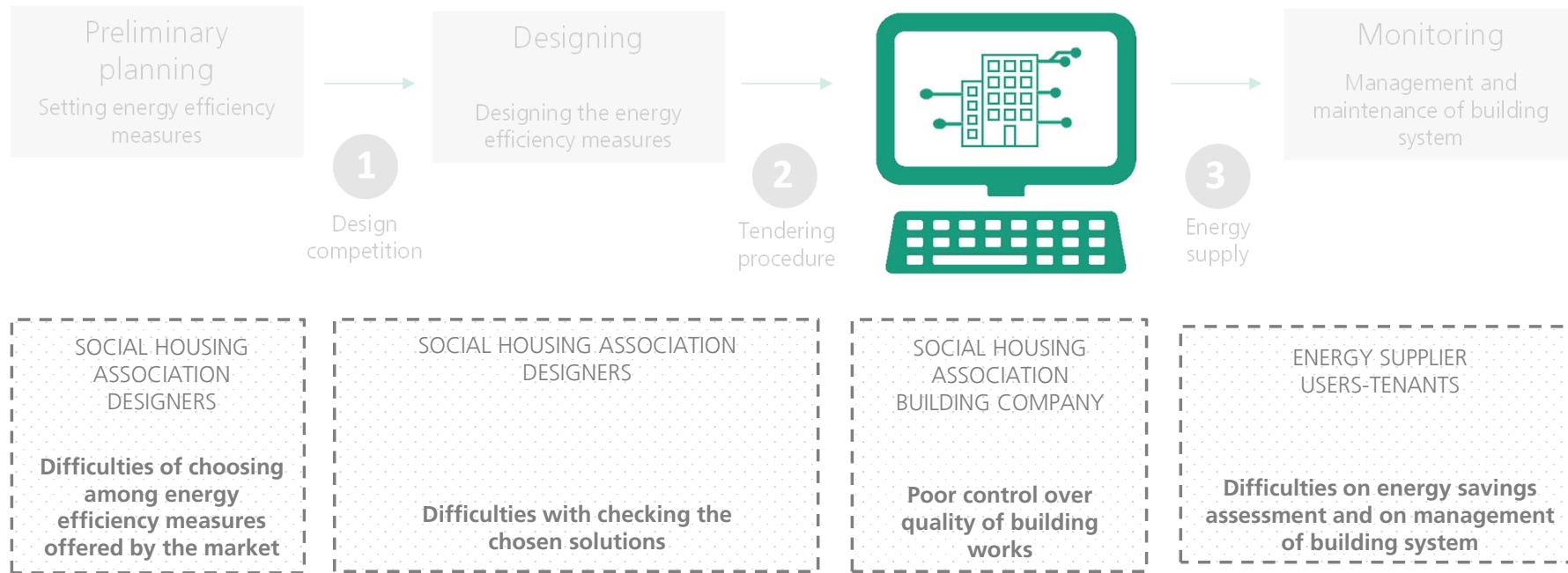
Soft criteria for tendering procedure

In order to **control the chosen solutions**, the **quality of the building works** and the **building management over the time** it is recommended to introduce the following elements as soft criteria into the tendering procedure:

- Building **energy performance guarantee**
- Planning of a **energy consumption monitoring system**
- **Management and maintenance plan**

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Critical issues' solutions



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**Soft criteria for
tendering procedure**

BIM

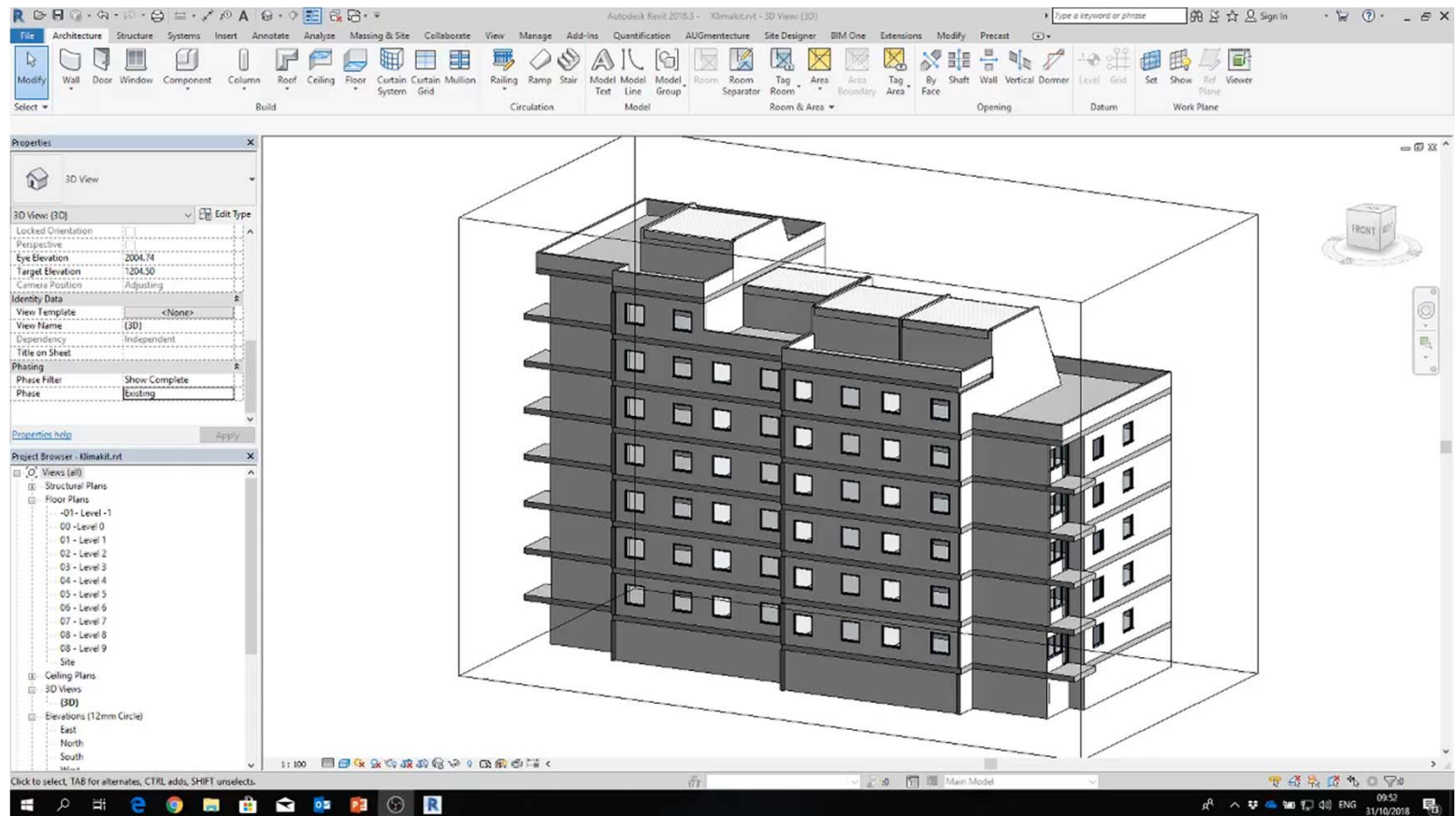
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BIM



Benefits of BIM for social housing Association and building retrofitting:

- Creating **BIM database** with information on energy efficiency measures
- **Optimization of building site management**
- Several potential in **management and maintenance of building and building system**
- **Coupling BIM** model with data from **monitoring system**



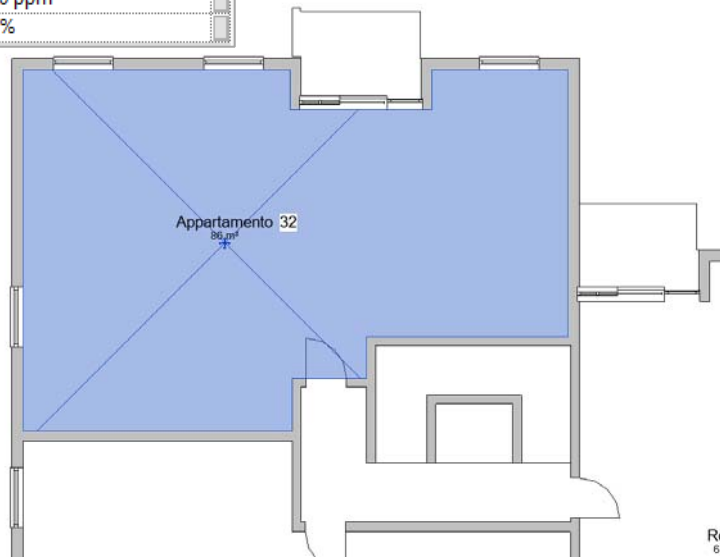
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BIM - Monitoring



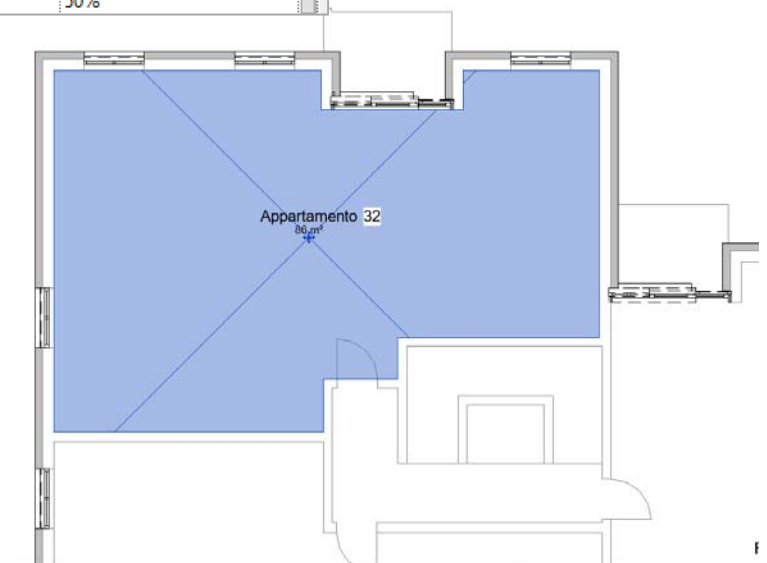
Existing building

Text	
M_Consumi elettrici	73 Wh
M_Temperatura	18,5°
M_Consumi termici	1553 Wh
M_CO2	900 ppm
M_Umidità	70%



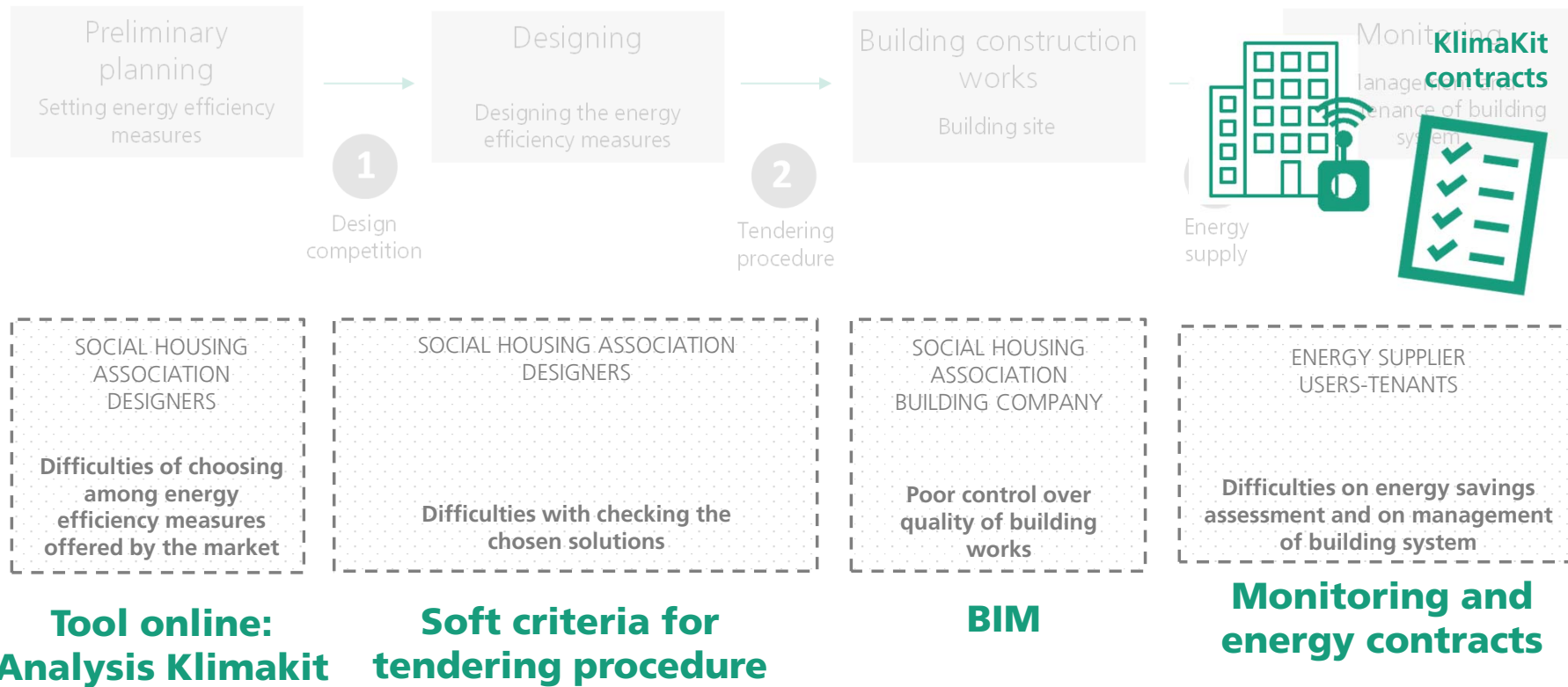
Post retrofit building

Text	
M_Consumi elettrici	91 Wh
M_Temperatura	20°C
M_Consumi termici	365 Wh
M_CO2	450 ppm
M_Umidità	50%



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Monitoring and energy contracts



Reliable **contractual tools** are essential to allow the application of Klimakit model. The Klimakit contracts support both the realization of the building retrofit project and the following phase of monitoring and management of building and building system. The **guide lines** for the Klimakit contracts specify:

- **Regulatory framework** of the energy supply contract
- Main **structure of the contract**
- Definition of **main contractual elements** (obligations, compensation, legal protection, duration etc.)

Klimakit: Modello organizzativo per il risanamento energetico

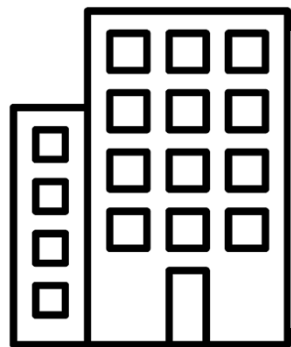
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Klimakit model

Existing business model



User – Tenant



Social housing
association



Energy supply