RenoZEB
Collaboration Platform
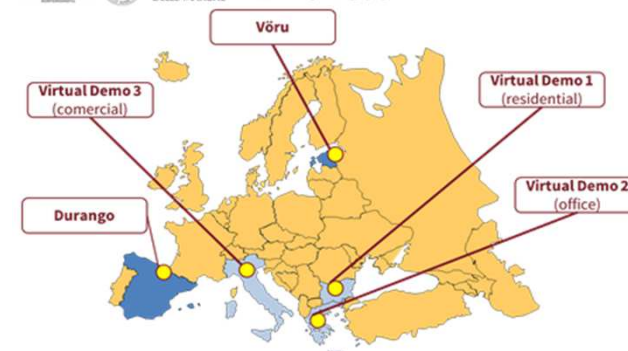
Asier Mediavilla (TECNALIA)

RenoZEB project: background
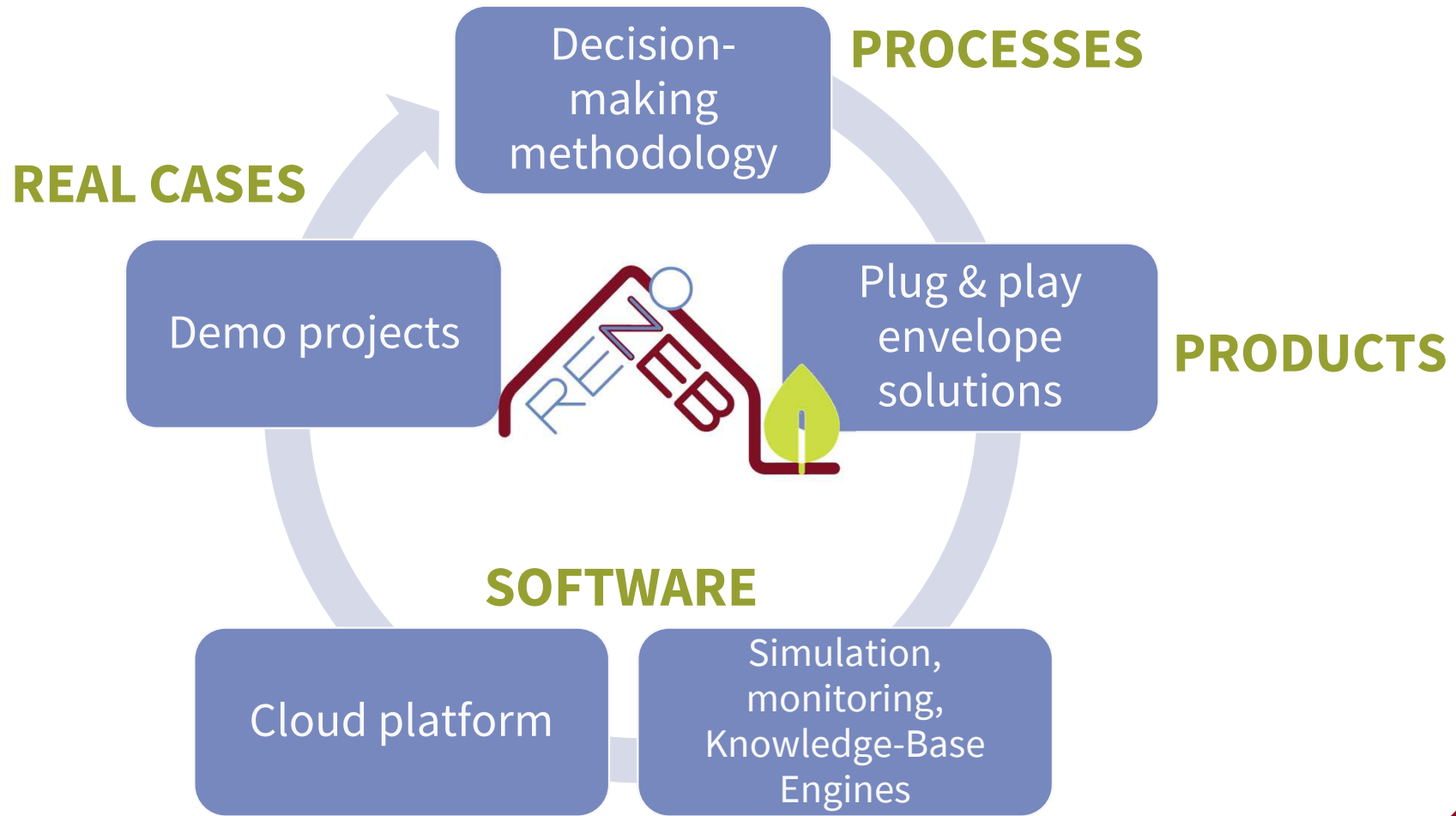
- **Current situation**
  - **Only 1.2 %** of the building stock is **replaced annually** (target for 2050: **2.9%**)
  - **Retrofitting** processes are **expensive, complex** and **disturbing**
  - **Lack of information** about existing conditions, leading to **uncertainties** and **inefficiencies**
  - **Poor** information **sharing**, multiple errors, lack of common view
- **RenoZEB aim**: to achieve
  - 16% cost reduction of renovation
  - 60% energy consumption reduction
 - 65% renovation process time reduction

RenoZEB: proposed solution in a nutshell

PROCESSES

Decision-making methodology

REAL CASES

Demo projects

Plug & play envelope solutions

PRODUCTS

SOFTWARE

Cloud platform

Simulation, monitoring, Knowledge-Base Engines

RenoZEB: the methodology

- **Collaborative approach** through the whole value chain
- Goal: **nZEB** (reduce energy consumption, increase share of RES)
- **Low disruption/intrusiveness** during building renovation
- **Replicability** and **adaptability** through modularity in order to capture a large-scale renovation market
- **Property-value** as trigger
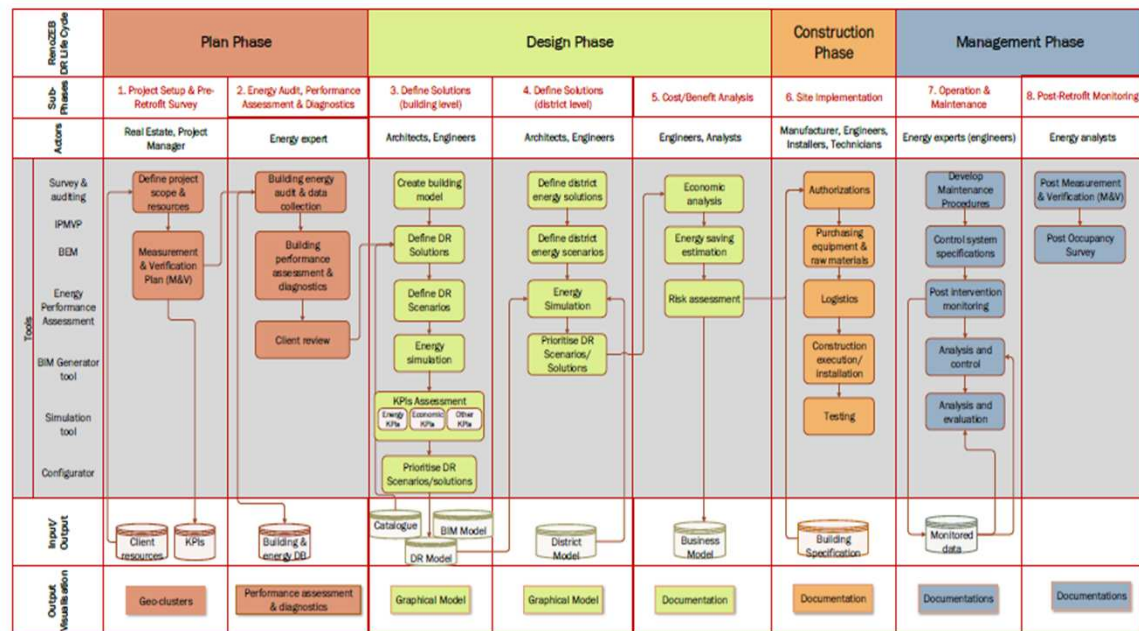
RenoZEB project: products and demos

Plug & Play product development

Mock-up installation

Validation in KUBIK (full-scale test infrastructure)

Renovation of real residential buildings

Durango (Spain)

Võru (Estonia)

RenoZEB project: software tools

- **CYPE Suite**: set of free specialist tools to cover all renovation process. Some tools have been adapted or developed from scratch in the RenoZEB project

Data Collection — **BIM Modelling** — **Renovation configurator** — **Energy Simulation** — **On-site logistics**

Point clouds

IFC Builder

Open BIM Focchi façades

CYPETherm EPlus

Arquimedes & Job Control
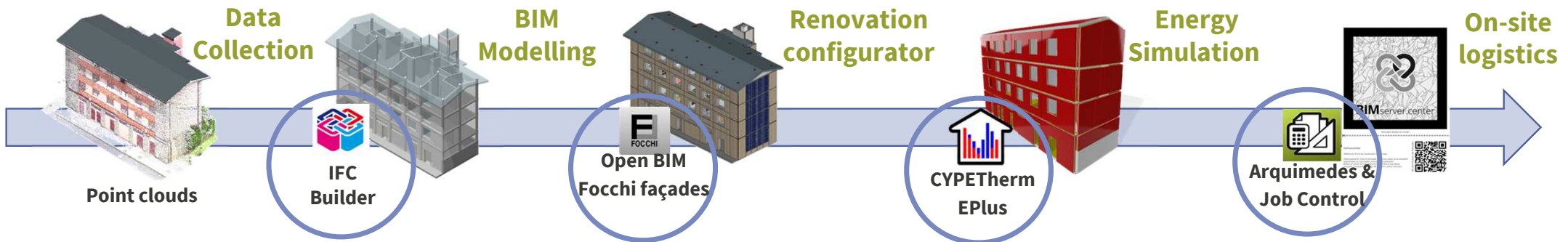
- **Monitoring tool**: web-app for building monitoring follow-up (pre- and post-renovation)

ZONE FILTER

TZ_001   Apply

HOLISTIC VIEW

BASELINE SUMMARY

Total Consumption	Total Cost	Average Temperature
1500 kWh	150 €	15.28 °C

POST INTERVATION BEMS CONTROL SUMMARY

Total Consumption	Total Cost	Average Temperature
1250 kWh	125 €	16.35 °C

Baseline Analysis

Post Intervation BEMS Control Analysis

Baseline vs Post Intervation BEMS Control Analysis
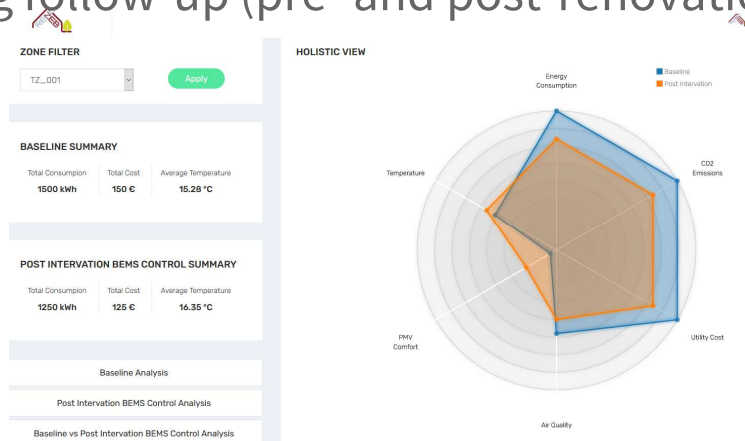
- **Knowledge base engine**: support in early decisions about suggestion of renovations and potential value increase of the building:
  - Climate data module
  - EPC data module

Retrofit Component

EPC
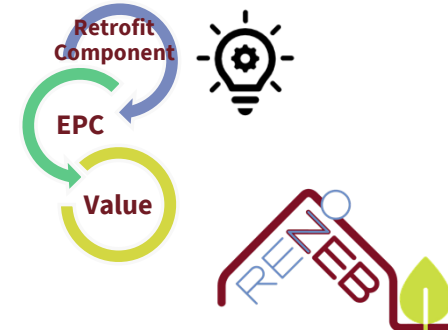
Value

RenoZEB Collaboration Platform

- The central **collaboration point** or **Common Data Environment** to integrate deep renovation value chain
  - **"Workflow-aware"** → phases, tasks, issues…
  - **Decision-making** → manage/compare scenarios, strategies & KPIs
  - Project **dashboard** with a 3D **Open BIM** (IFC) viewer
  - **Public APIs** for integration of external tools

Plan phase   Design phase   Construction phase   Management phase

RenoZEB Platform

Functionalities & Information exchanges could vary from one phase to another

Building owner

IFC

Designers

RenoZEB Platform

Simulation tools

Engineers

Consultants
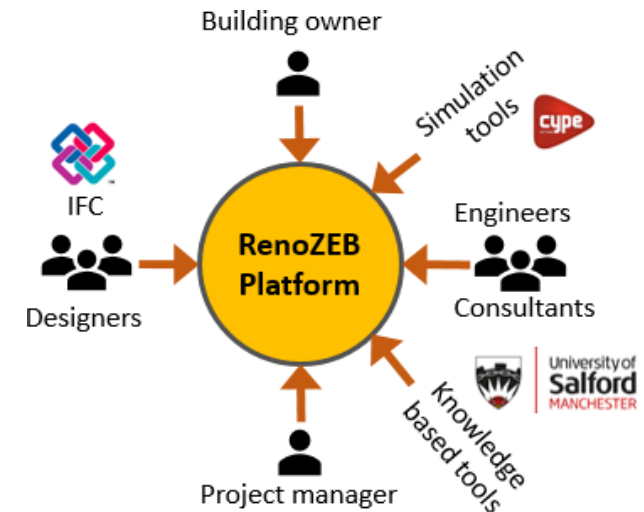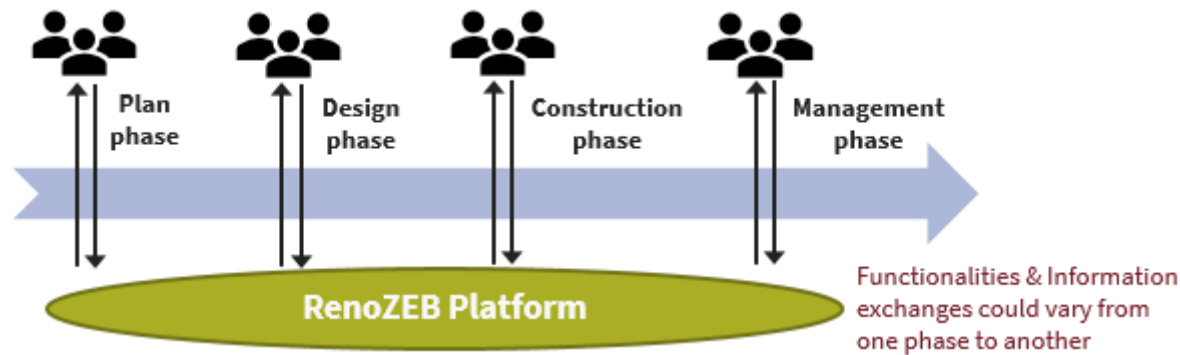
University of Salford MANCHESTER

Knowledge based tools

Project manager

RenoZEB Collaboration Platform
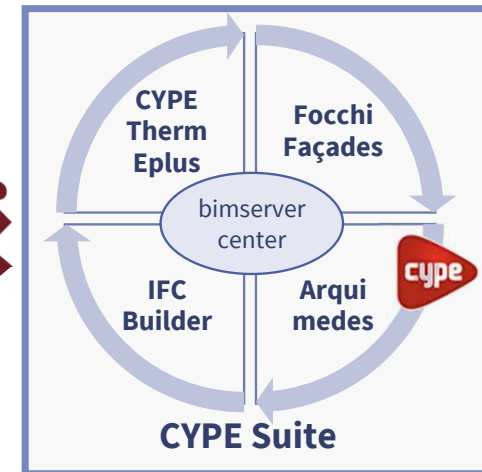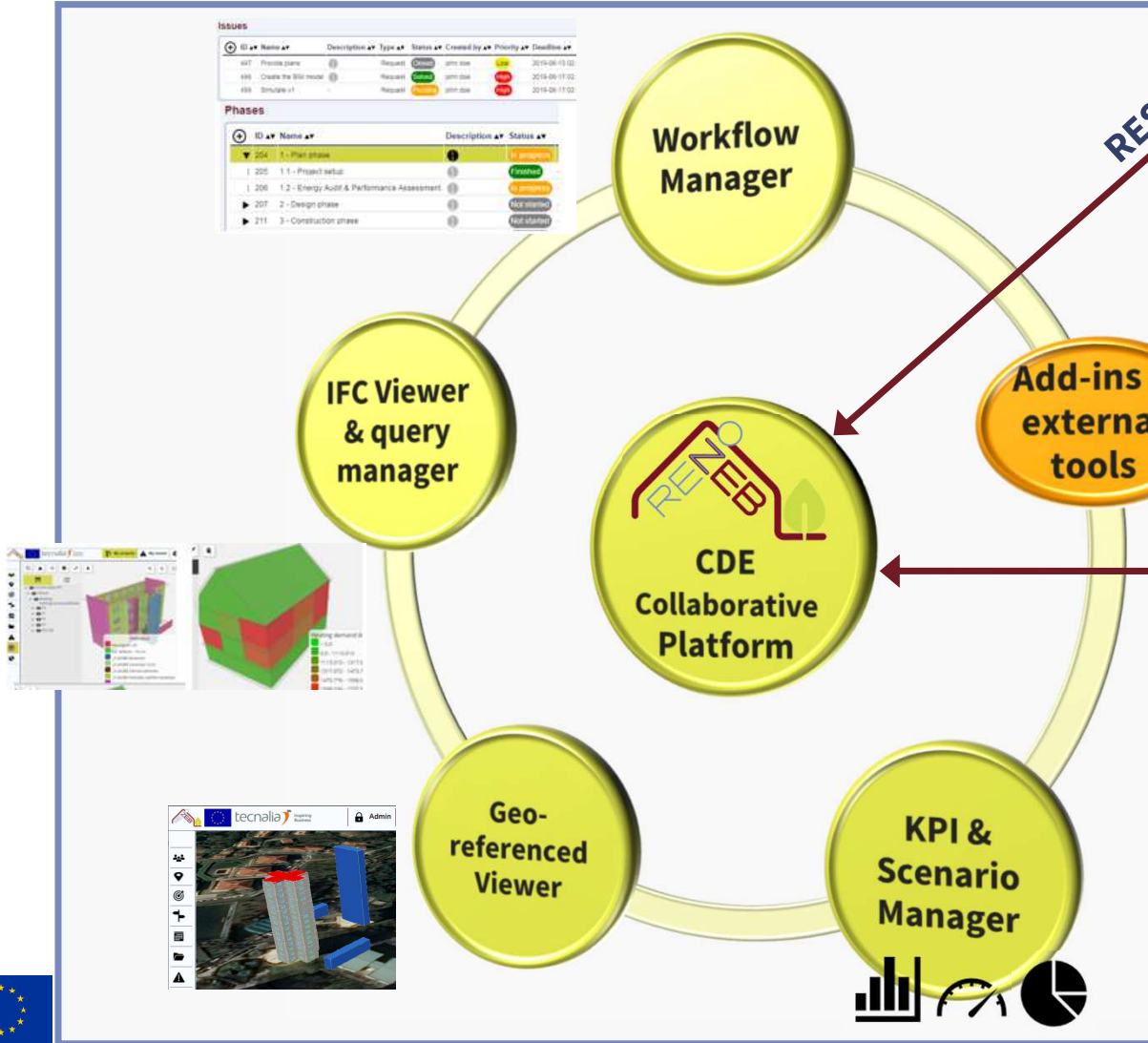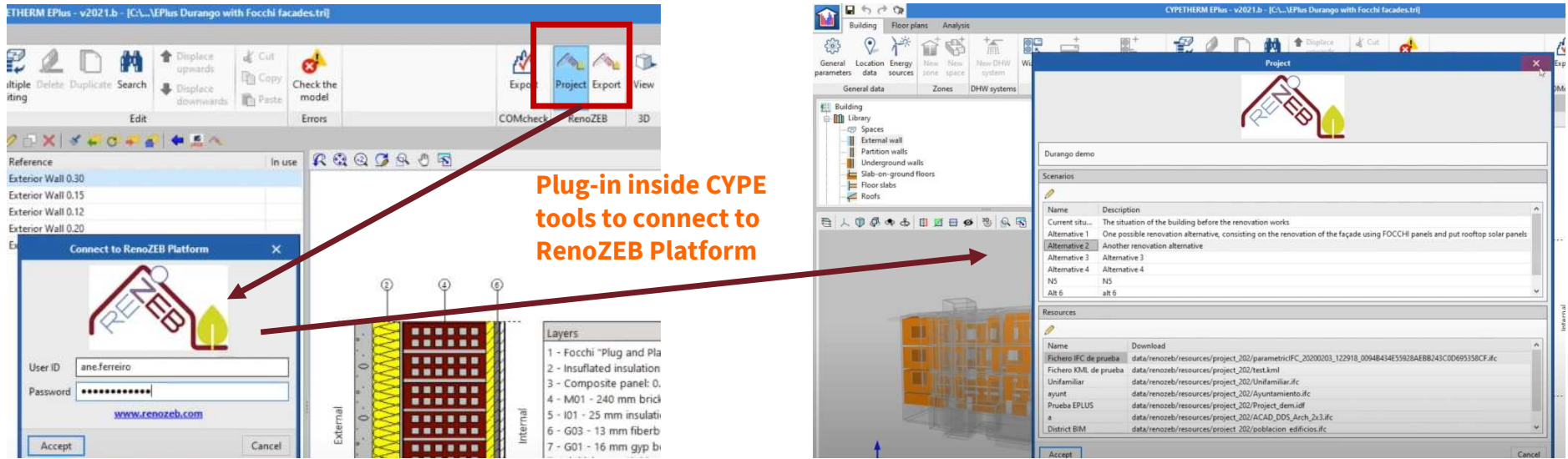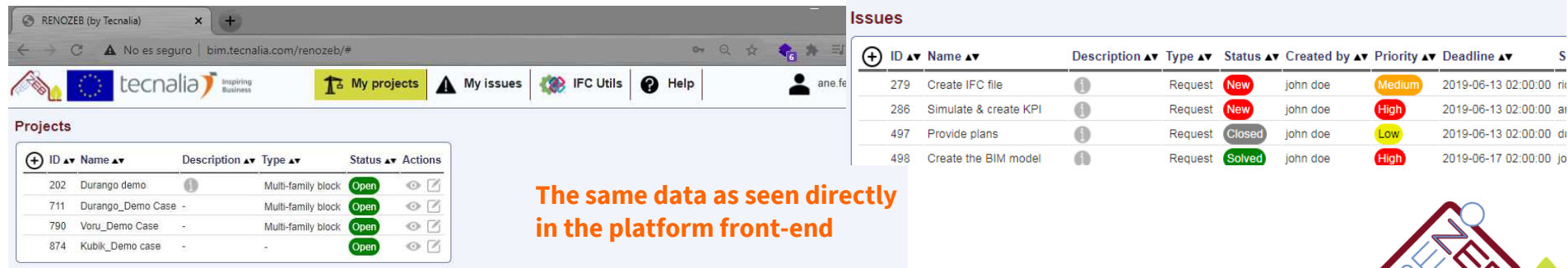
RenoZEB Platform: 3rd party tools integration
Plugin-based approach (using REST-API), e.g. CYPE-tools

Client tool

Platform

Plug-in inside CYPE tools to connect to RenoZEB Platform

The same data as seen directly in the platform front-end

Presentation title, name of the

RenoZEB Platform: 3rd party tools integration

Seamless GUI integration through HTML, e.g. monitoring system from HYPERTECH
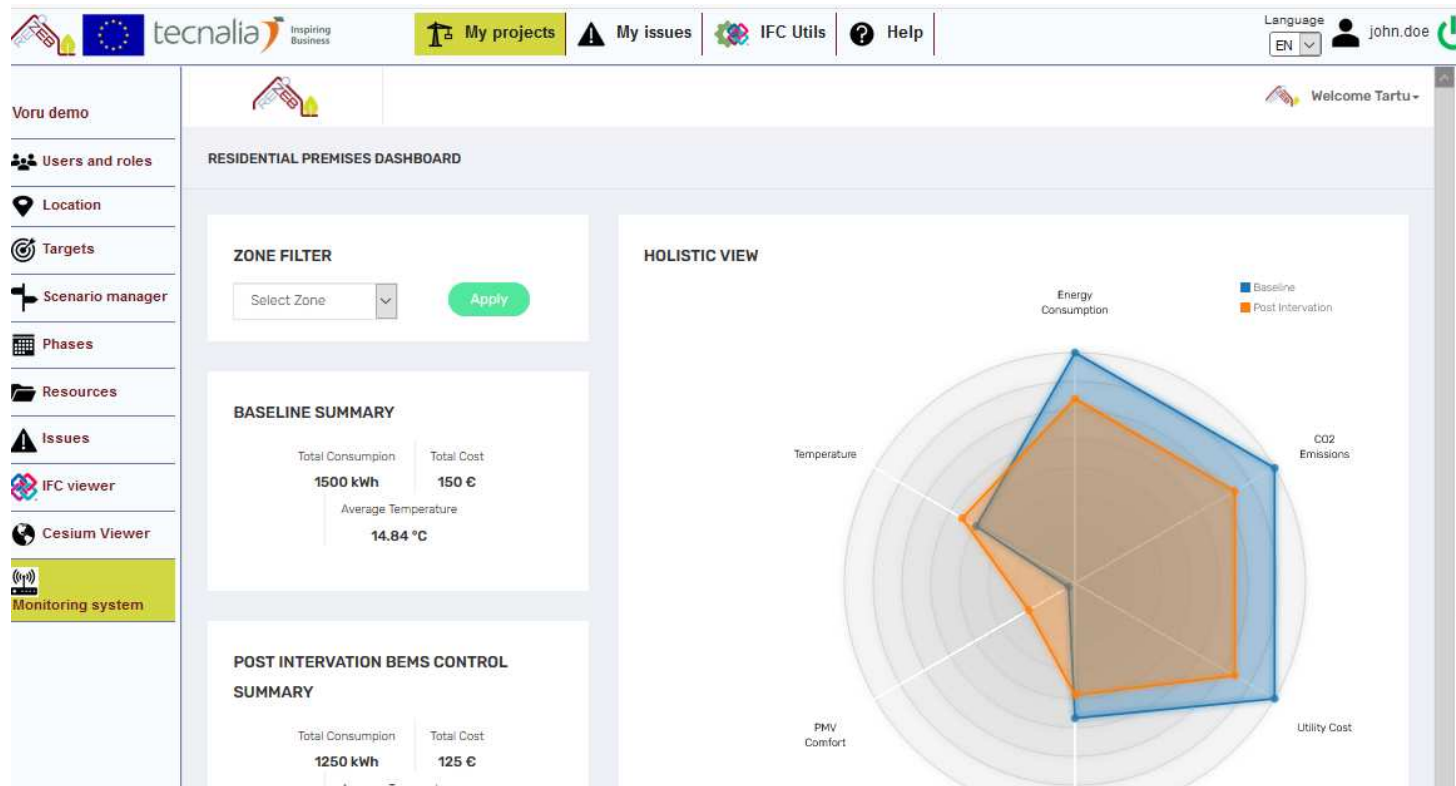
Presentation title, name of the

RenoZEB Collaboration Platform

Platform: "high-level" information → better communication, understanding & **decision-making**

Specialist tools: detailed calculations, low-level data → **accuracy/reliability**
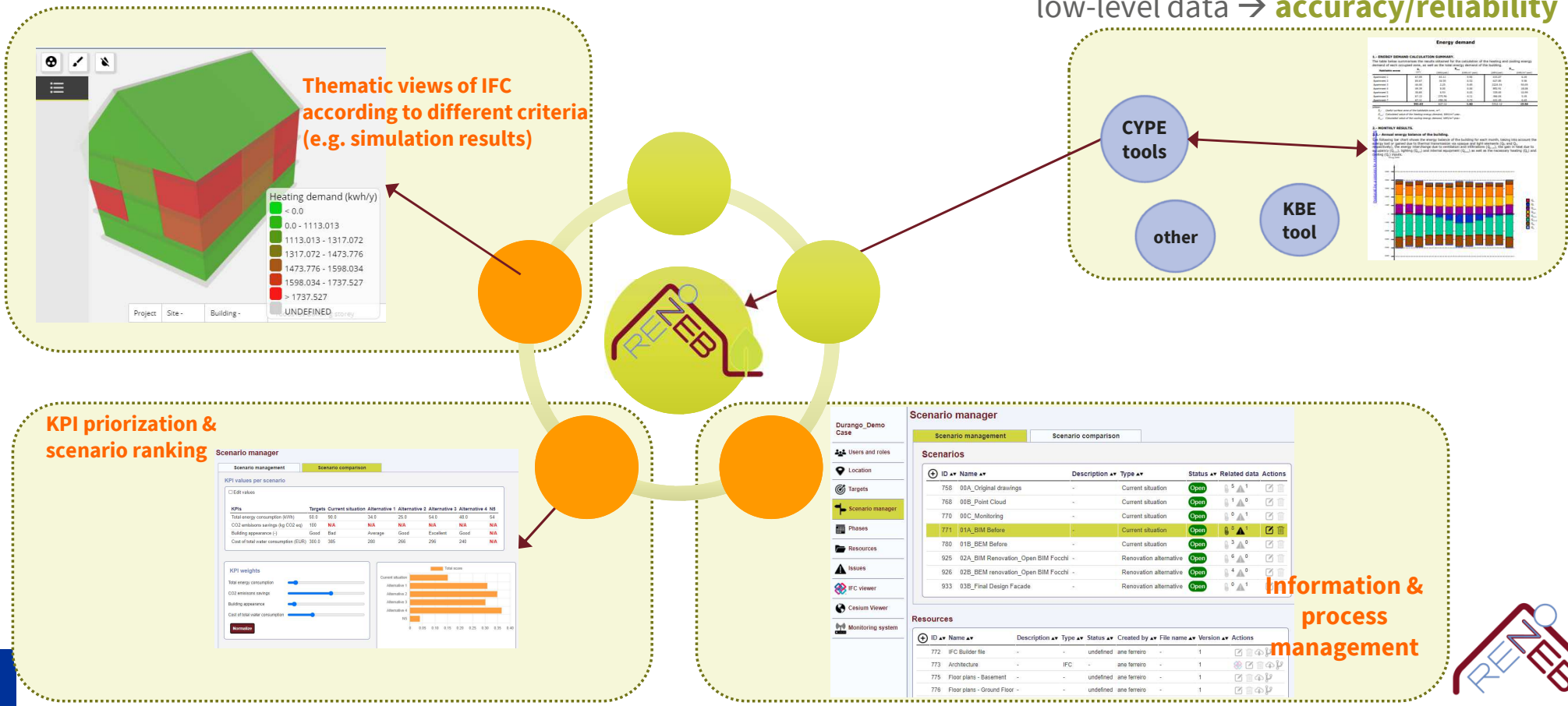
Thematic views of IFC according to different criteria (e.g. simulation results)

CYPE tools

KBE tool

other

KPI priorization & scenario ranking

Information & process management

RenoZEB Platform: KPI/scenario manager

Select KPIs & their scoring system

Create renovation scenarios

Select KPI weights and rank scenarios

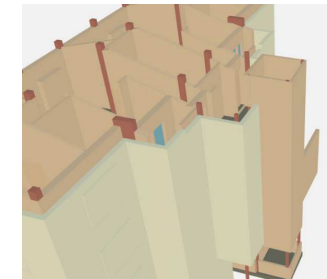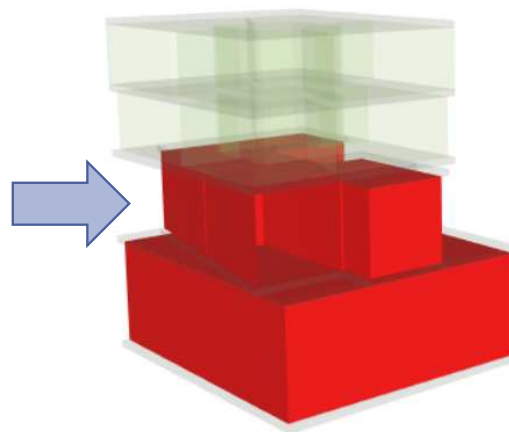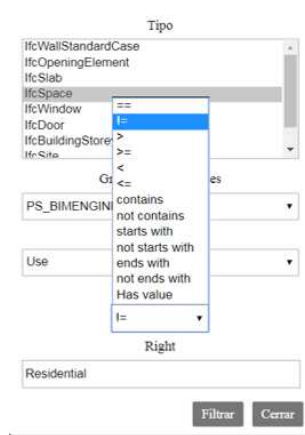Presentation title, name of the

RenoZEB Platform: Model visualization & audit

Possibility to **filter & query** IFC models (even district/multi-building approach)
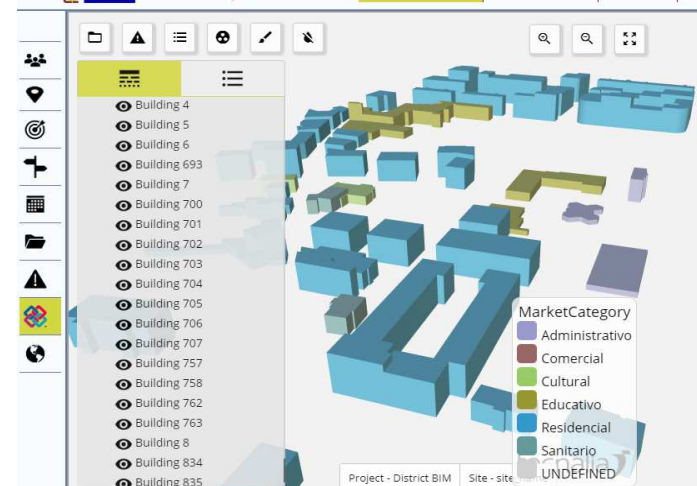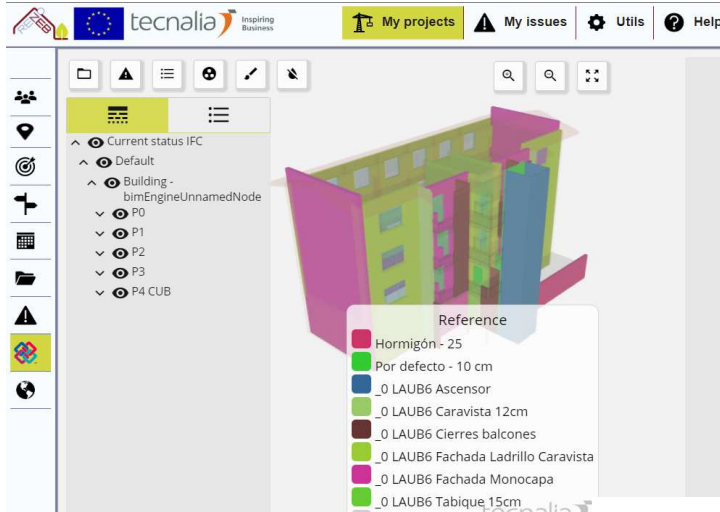
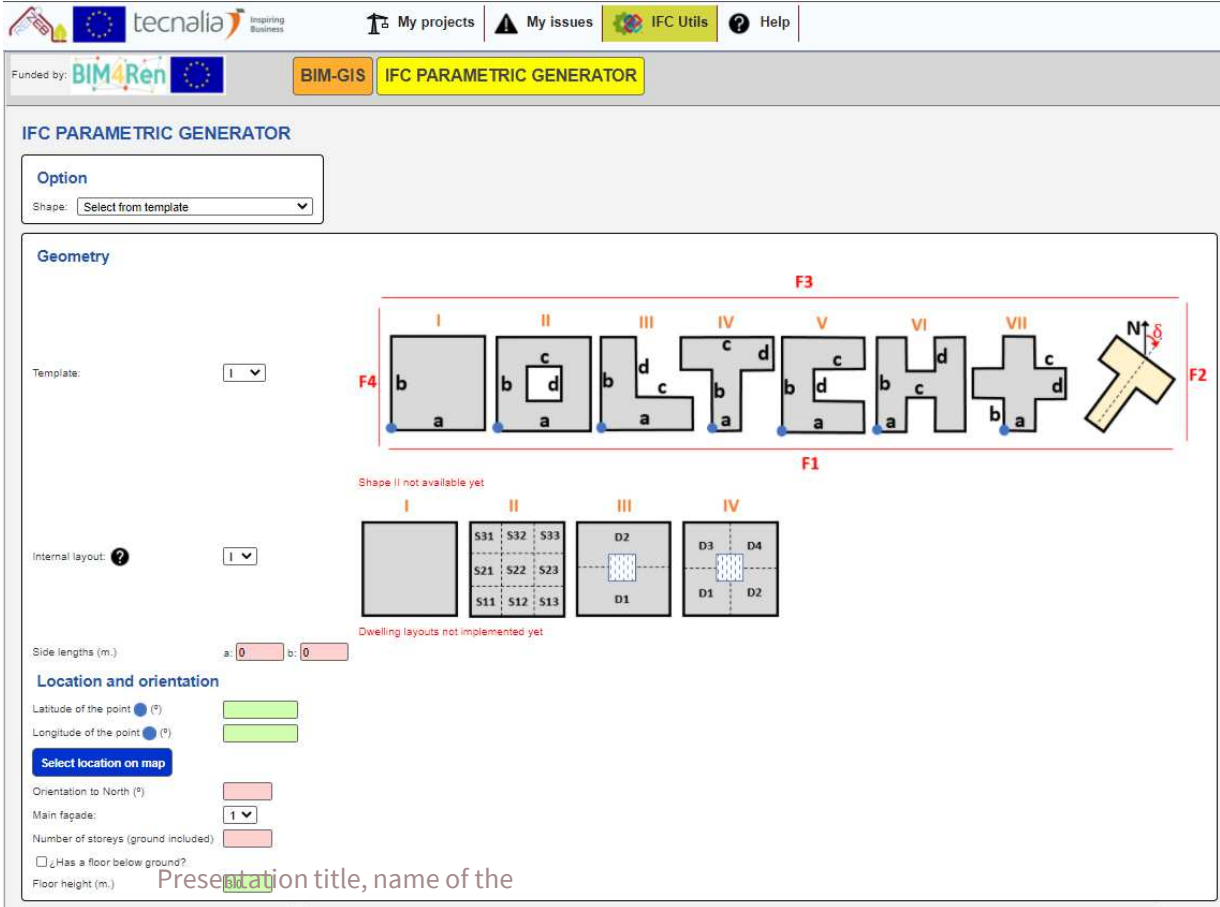**Sample query: "select non-residential zones"**

Multi-model views: e.g. before & after renovation

27/10/2020

RenoZEB Platform: add-ins & utilities

Modular architecture, which enables to add new functionalities

As an example, **IFC auto-generation** & **BIM-GIS interoperability** services, developed in another H2020 project)

Presentation title, name of the

asier.mediavilla@tecnalia.com