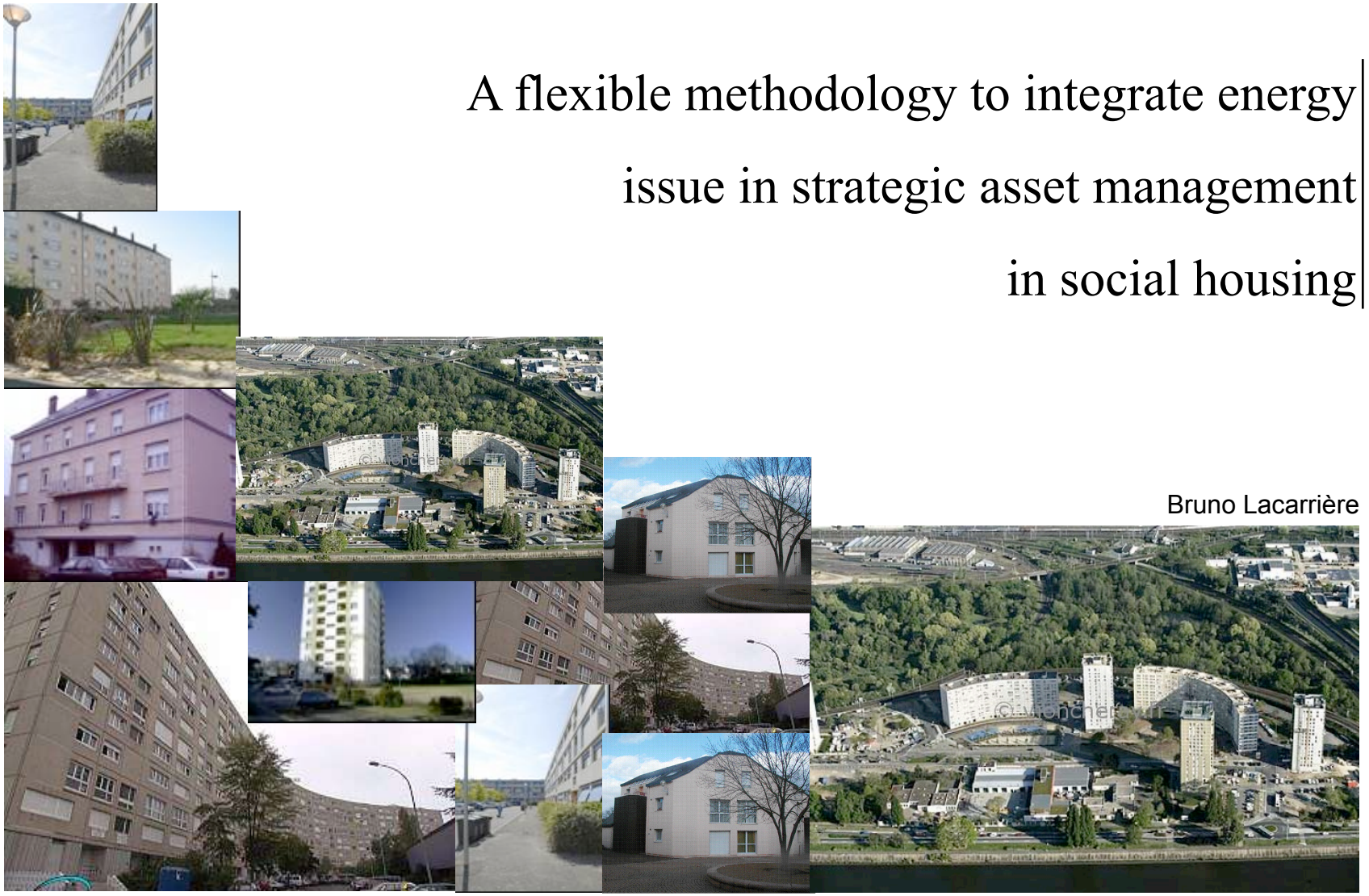


A flexible methodology to integrate energy issue in strategic asset management in social housing

Bruno Lacarrière

Context

- IEE-ESAM Project
- Social Housing Operators (SHO) + Energy Agency + Research teams →6 countries

French illustration

- 27% of social dwellings are classified between G and E (EPCs)
- By increasing them to the class C, 8 TWh/y and 1.5 10^6 t_{CO2}/y could be saved

SHOs and Energy

- some SHOs are familiar with Strategic Asset Management (SAM) (60% for France)
- Energy issue in decision tools is recently considered
- SAM tools are based on classical criteria: economical, attractiveness, financial possibilities…
- 2 ways to integrate Energy issue in decision processus: Energy in SAM or Energy after SAM.

Purpose

To build a flexible methodology to integrate Energy in the decision tools.

An IS which helps to decide, not a black box which decides

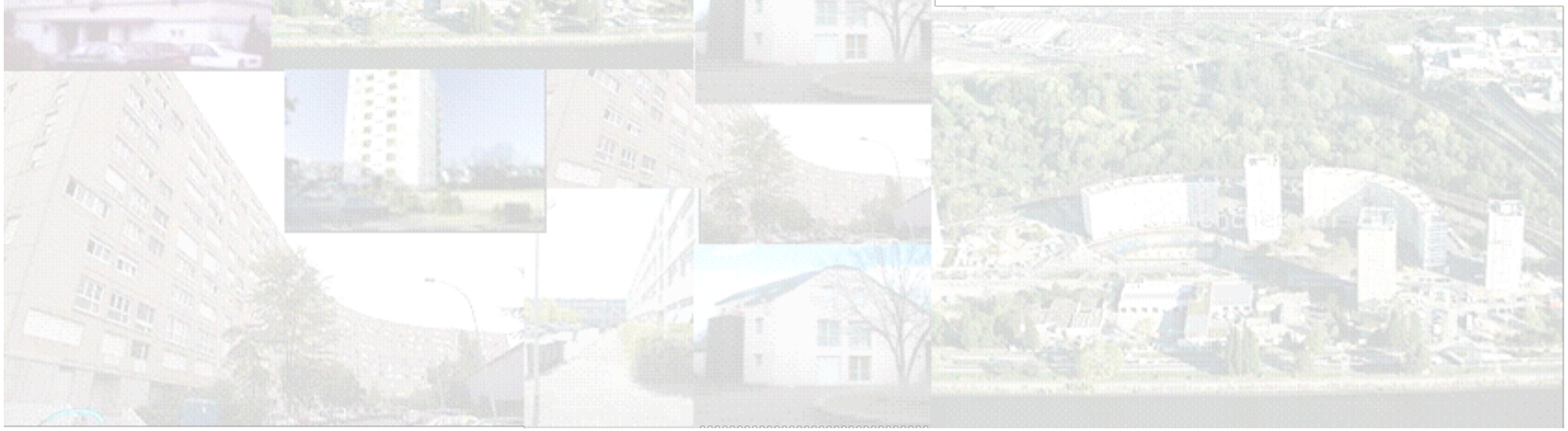
Book of specification

- potential lack of internal skills in thermal modelling (size of the SHO)
- possibility of a core calculation
- various SHO situations (data available)
- open to the EPCs (carefully in France)
- self auto improvement (gathering feedback)
- 3 scales: building, set of buildings, the whole stock

→ ***Flexibility***

Methodology (key points)

- Typology (and sub typologies) approach
- Items used to link scenarios and element studied
- Various solutions to determine and to evaluate actions



Methodology (key points)

- **Typology (and sub typologies) approach**
  - **1st level:**
    - **Period of construction (link with thermal standards)**
    - **Type (house, small building, tower…)**
    - **Profile (compact, high, elongated…)**
    - **Materials used (concrete, wood, bricks, glass wool…)**
  - **2d level:**
    - **HVAC systems (boilers, central heating district, natural or mechanical ventilation…)**
  - **3rd level:**
    - **Hot Water Production (collective/individual)**

→ ***useful for buildings not totally known***

Items

Item	Component	Potential for improvement and reference value associated			
Vertical walls of envelope	walls	Present situation (equivalent U-value1)	1st level of improvement (equivalent U-value2)	2d level of improvement (equivalent U-value3)	3rd level of improvement (equivalent U-value4)
Vertical walls of envelope	windows	Present situation (e.g. single glazing)	1st level of improvement (e.g. Double glazing)	2d level of improvement Double glazing (argon)	3rd level of improvement Double glazing (argon + low emissivity)
…	…	…	…	…	…
Heating system	Heat production efficiency	Present situation (e.g. boiler type 1)	1st level of improvement (e.g. boiler type 2)	2nd level of improvement (e.g. boiler type 3)	3rd level of improvement (e.g. boiler type 4)
Heating system	Heat distribution efficiency	Present Situation $¥_0$	Insulation level $¥_1$	Insulation level $¥_2$	Insulation level $¥_3$
…	…	…	…	…	…

Methodology (key points)

- **Various solutions to determine and to evaluate actions**

-Classical energy audit (expensive but possible in some cases)

-Energy Performance Certificates

-Tables of elementary actions (French choice)

-Gathering of feedback experiences

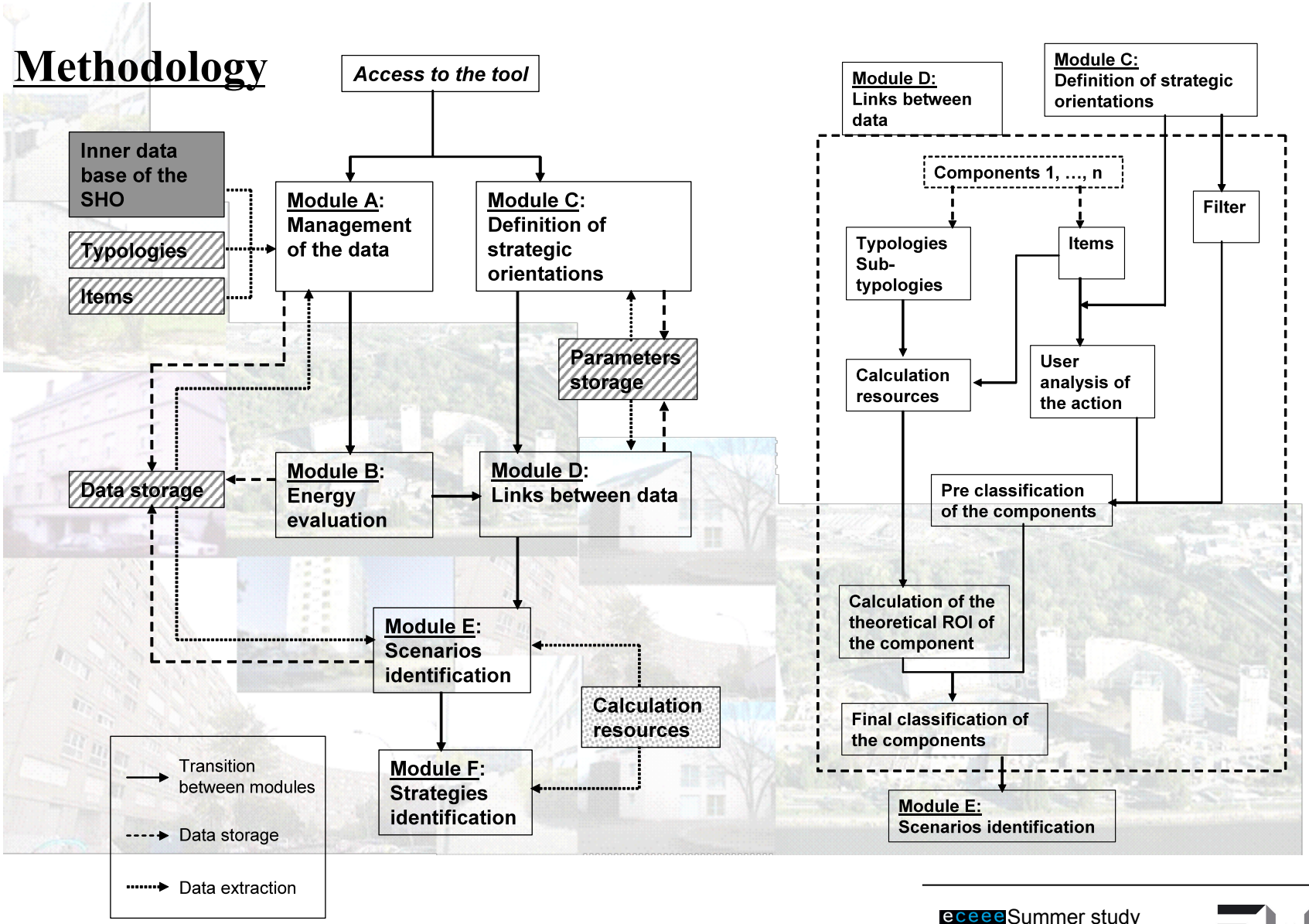
-Core calculation (German choice)

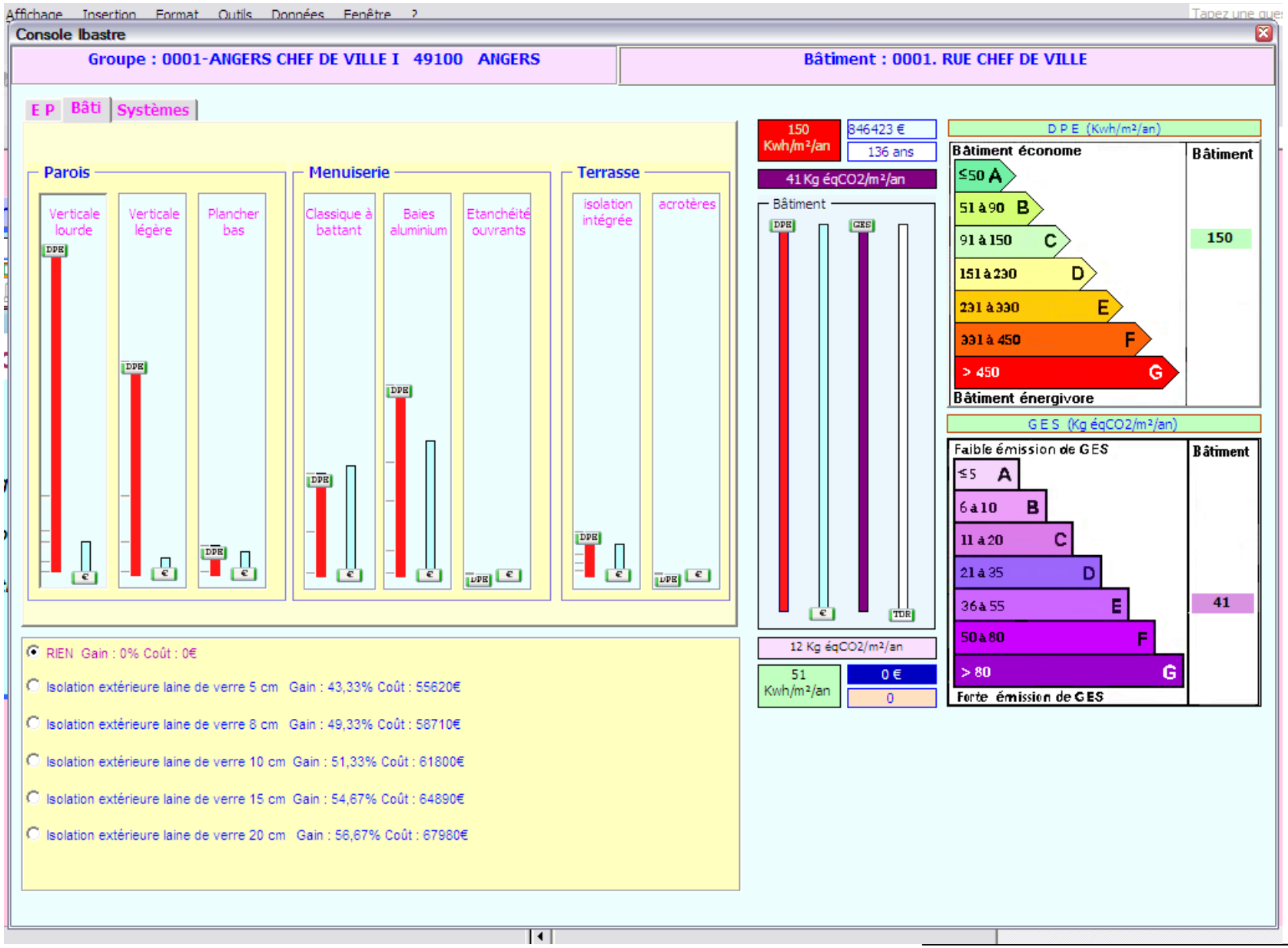
-…

→Scenarios are combination of elementary actions (identified by the same item approach seen previously)

→Evaluation actions and/or scenarios are made both in the energy and economical points of view

Methodology




Affichage Insertion Format Outils Données Fenêtre ?
Console Ibastre
Groupe : 0001-ANGERS CHEF DE VILLE I 49100 ANGERS
Bâtiment : 0001. RUE CHEF DE VILLE
E P
Bâti
Systèmes
Parois
Verticale lourde
Verticale légère
Plancher bas
Menuiserie
Classique à battant
Baies aluminium
Etanchéité ouvrants
Terrasse
isolation intégrée
acrotères
DPE
€
150 Kwh/m²/an
846423 €
136 ans
41 Kg éqCO2/m²/an
Bâtiment
CEE
TDR
12 Kg éqCO2/m²/an
51 Kwh/m²/an
0 €
0
RIEN Gain : 0% Coût : 0€
Isolation extérieure laine de verre 5 cm Gain : 43,33% Coût : 55620€
Isolation extérieure laine de verre 8 cm Gain : 49,33% Coût : 58710€
Isolation extérieure laine de verre 10 cm Gain : 51,33% Coût : 61800€
Isolation extérieure laine de verre 15 cm Gain : 54,67% Coût : 64890€
Isolation extérieure laine de verre 20 cm Gain : 56,67% Coût : 67980€
D P E (Kwh/m²/an)
Bâtiment économe
Bâtiment
≤50 A
51 à 90 B
91 à 150 C
151 à 230 D
231 à 330 E
331 à 450 F
> 450 G
150
Bâtiment énergivore
G E S (Kg éqCO2/m²/an)
Faible émission de GES
Bâtiment
≤5 A
6 à 10 B
11 à 20 C
21 à 35 D
36 à 55 E
50 à 80 F
> 80 G
41
Forte émission de GES

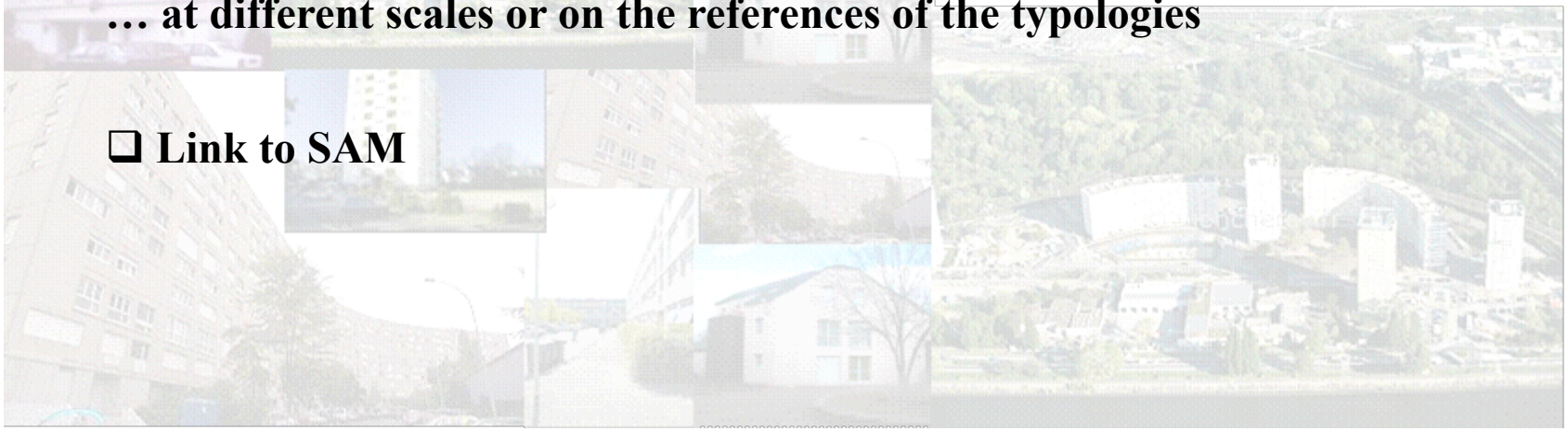
Implementation

- Test of different actions and/or combined solutions

- Find the more efficient solution or scenario for a finite investment amount or Find the more interesting financial solution for a defined energy performance target

… at different scales or on the references of the typologies

- Link to SAM



… thank you