CIB Presents:

An International Workshop on

Integrated Design & Delivery Solutions (IDDS)

The IDDS Workshop Planning Committee:
Nicole Testa Boston (FIATECH)
Shyam Sunder (CIB and NIST)
Jack Davis (CIB and Virginia Tech)
Tom Regan (CIB and Texas A&M)
Robert Owen (The University of Salford, UK), Coordinator of IDDS Priority Theme
Andrew P. McCoy (CIB IDDS and Virginia Tech)

Future delivery of BIM-based & standard-based applications and services: an insight in French and European developments

A vision from CSTB

CIB IDDS – FIATECH Workshop
Westin Arlington Gateway Hotel in Ballston, VA
18th April 2012

Carole LE GALL – CEO
CSTB - Centre Scientifique & Technique du Bâtiment

CSTB
le futur en construction

Presentation overview

- CSTB: who we are – *in a nutshell*
- CSTB: international partnerships & activities
- Integrated design, delivery & operation of Buildings
  - The expected role of BIM
  - Configuration tools : make it flexible and accurate
  - Multidisciplinary evaluation : make it collaborative
  - 3D recognition : make it easy and affordable
  - SBA & BIM

CSTB overview

- ***Centre Scientifique et Technique du Bâtiment***
  - State-owned research and assessment institute in the construction sector
    - Active member of ENBRI
    - General Secretary of ECTP
    - General Secretary of E2BA
  - Mission:
    - Improvement of the quality of life in buildings and their environment
  - >900 employees, 50% engineers & researchers
  - Turnover: 92.4 M€ (2011)

CSTB know-how, expertise, equipments

Nantes

Sophia Antipolis

Champs sur Marne (Paris)

Grenoble

CSTB: international partnerships & activities

- **CIB Member**
  - Board member (C. Le Gall)
  - Active participation to various CIB WGs & TGs
  - Organisation of the Joint CIB W078-W102 conference (25-28 October 2011, Nice, France)
- **FIATECH**
  - Member of the European Advisory Board (A. Zarli)
- **BuildingSmart International**
  - Active member of the French Chapter (Mediaconstruct)
- **Sustainable Building Alliance (SBA)**
  - Co-chair of the association for the definition of science based shared indicators for evaluation of the environmental performance of buildings
- **Partnership with NIST**
  - Collaboration on fire security, energy efficiency, indoor air quality, material and systems lifecycle in buildings,…

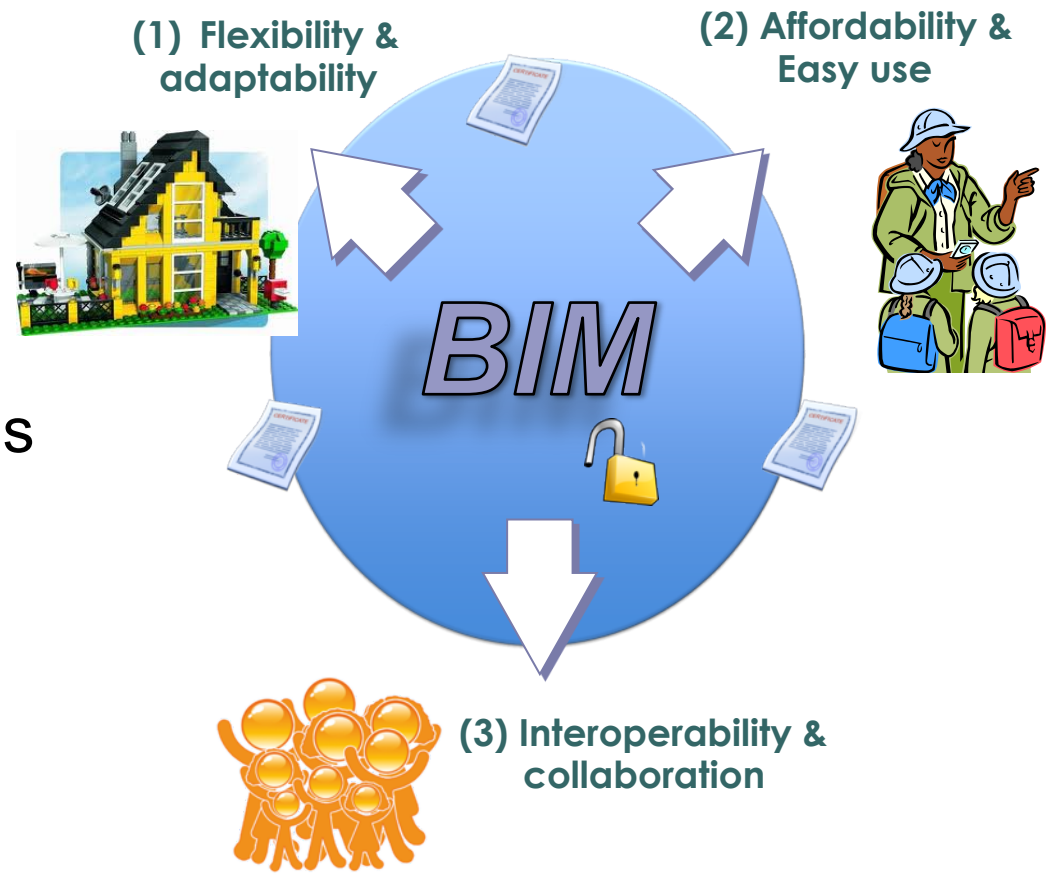
BIM-based ICT tools and systems

-current advanced developments in France
- latest research and innovative applications
- a ground for identifying common CIB (IDDS) and FIATECH research challenges, trajectories and further synergies.

BIM as key ICT pillar supporting major challenges in Construction

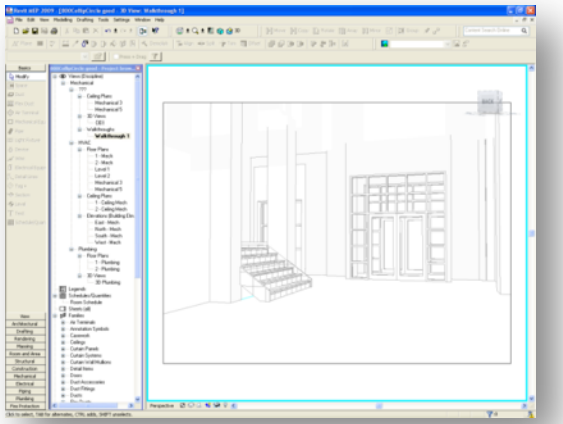
- Construction strong features
  1. Each building is a prototype
  2. Many companies are SMEs
  3. Multi-disciplinarity is required

→ *Need for flexible, affordable, collaborative technology!*



Make it flexible and accurate!

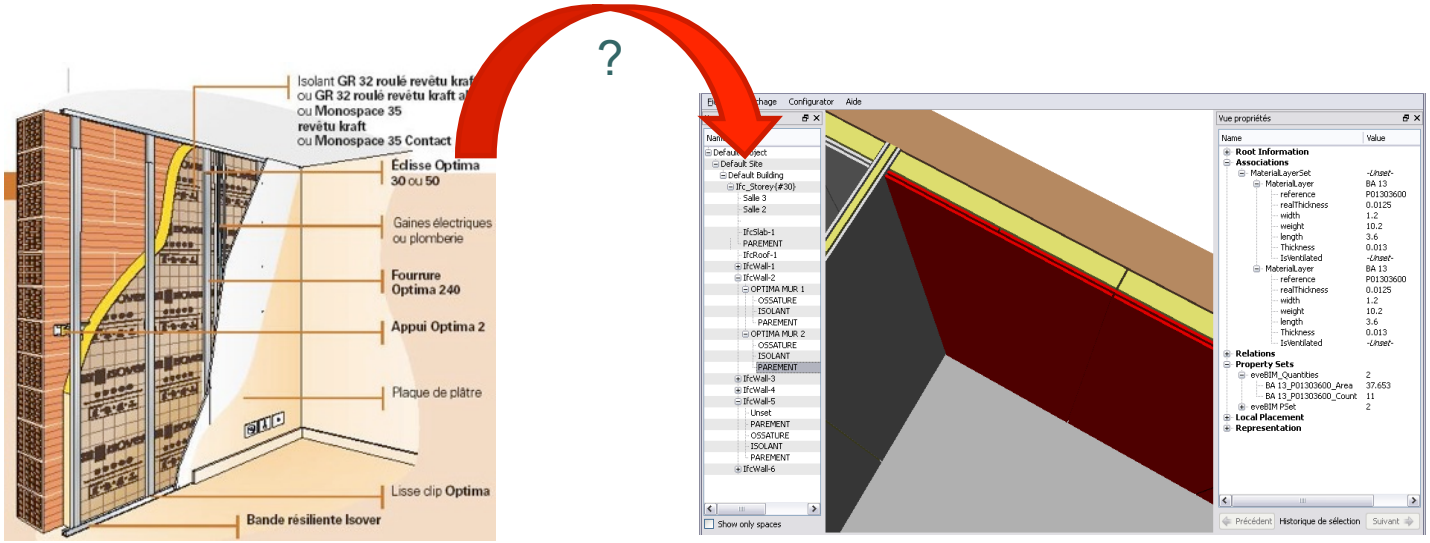
- In most cases, we use BIM models that are only made of generic information on materials, systems, and components
- They do not contain real and precise description of industrial products and systems used in the construction project
- This is a problem:
  - regarding the precision and completion of the model
  - regarding the accuracy of the simulations done using this model

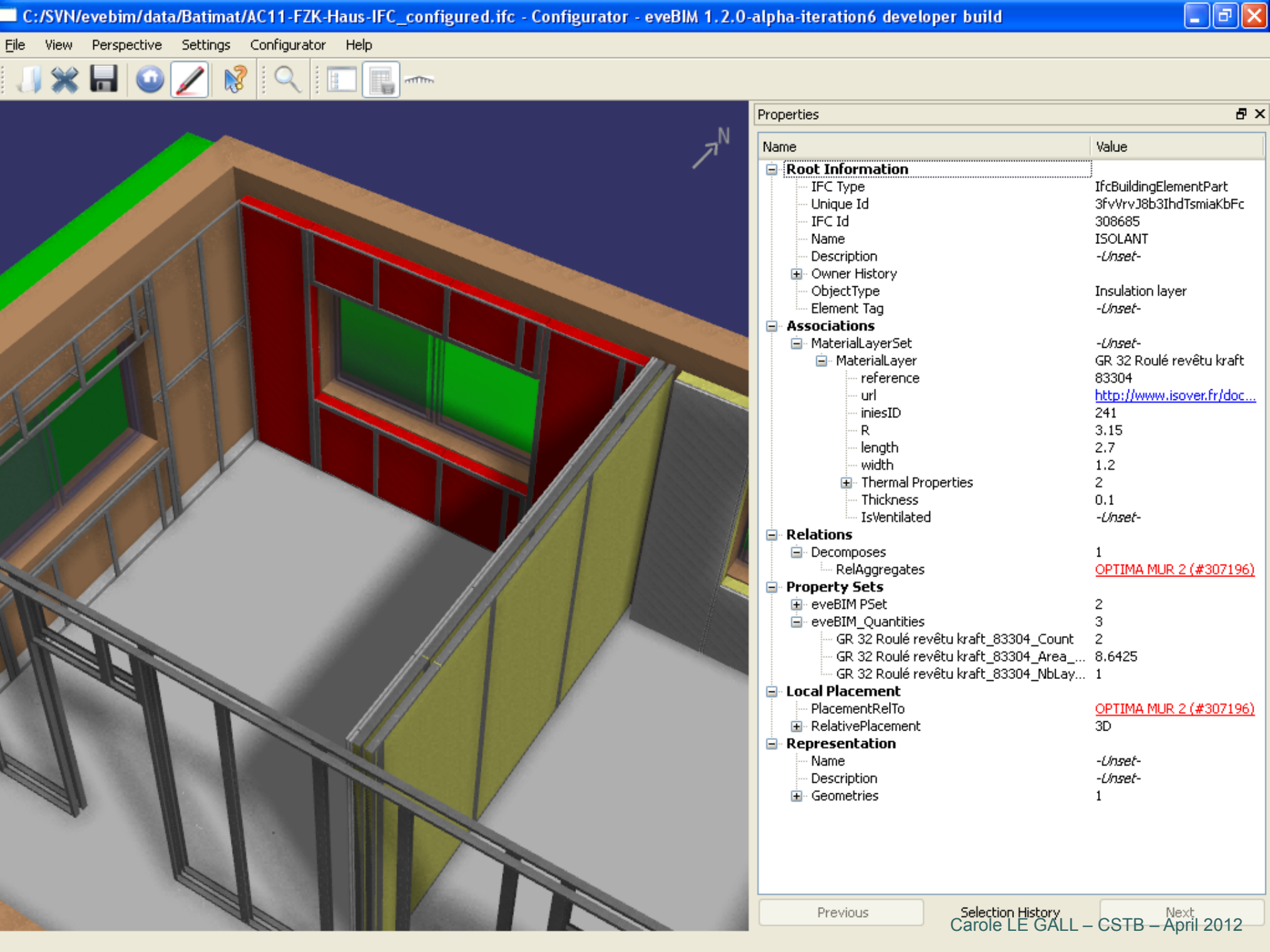


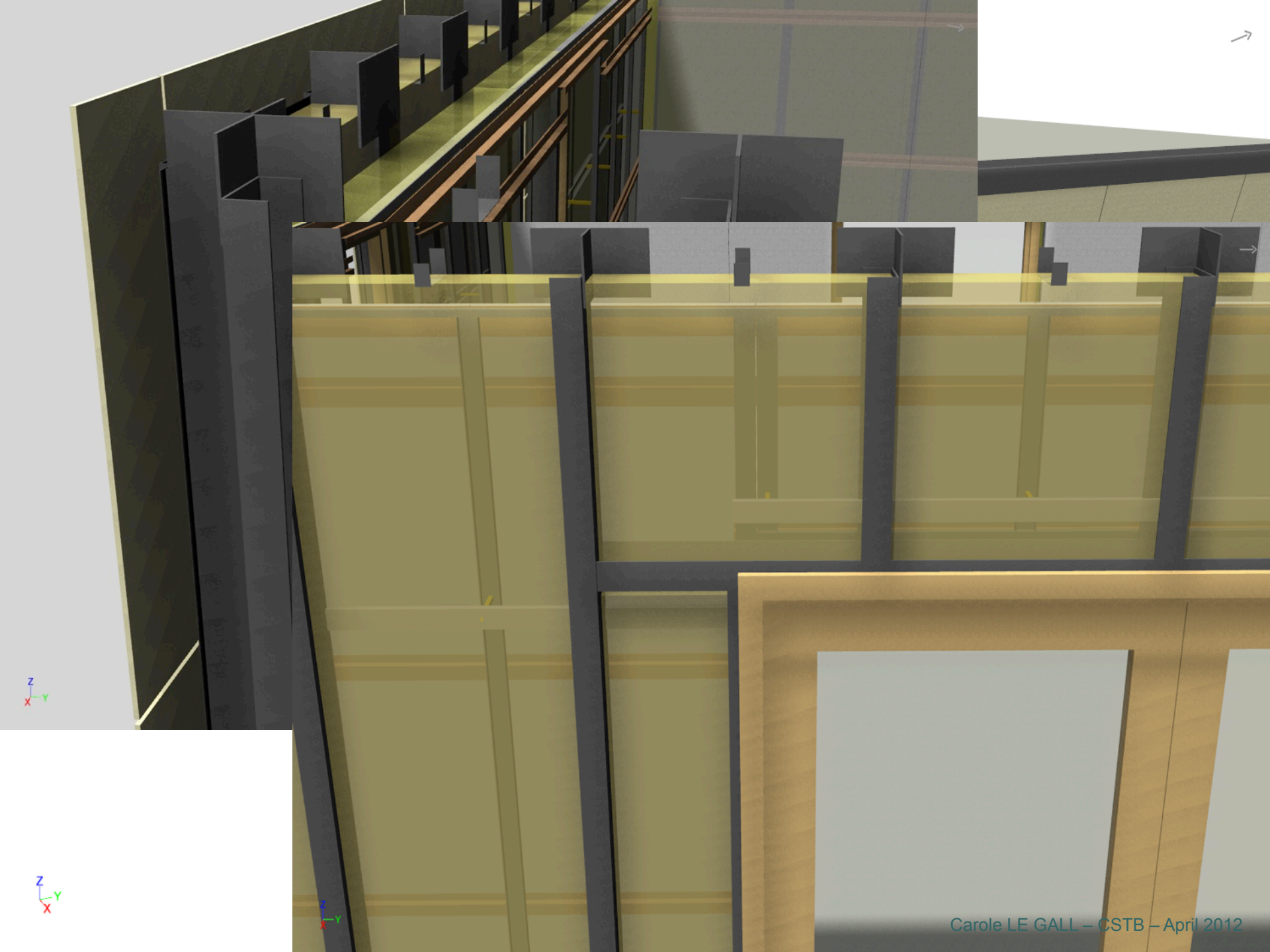
#

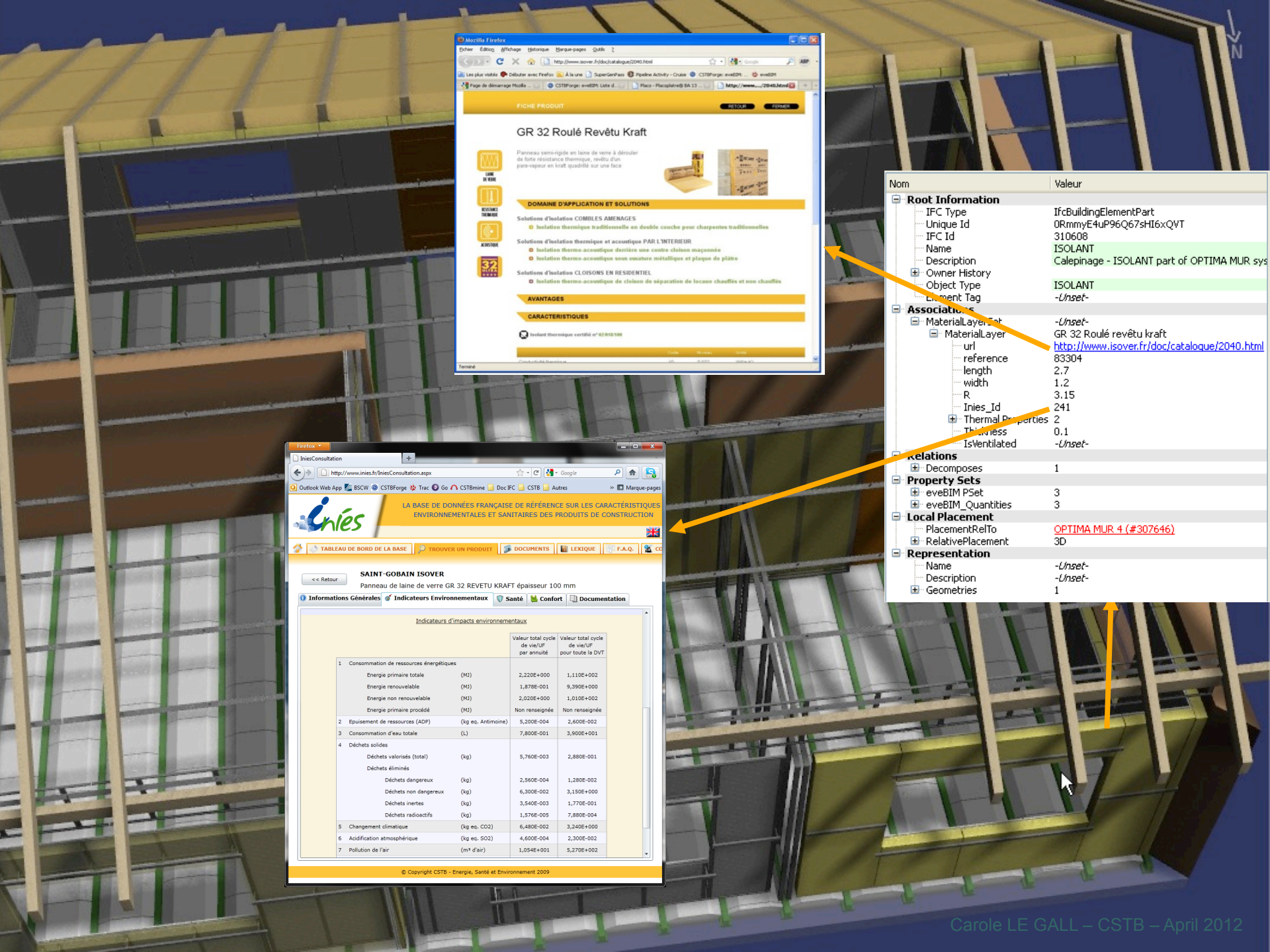
Configuration tools

- To make BIM a central element for the entire building lifecycle, it is of paramount importance to include detailed information about the industrial components and systems actually used => extended BIM
- Configuration tool allowing to ease the task of the designer by automatically generating execution details of the systems used in coherence with construction guidelines provided by the manufacturers




C:/SVN/evebim/data/Batimat/AC11-FZK-Haus-IFC_configured.ifc - Configurator - eveBIM 1.2.0-alpha-iteration6 developer build
File View Perspective Settings Configurator Help
Properties
Name Value
Root Information
IFC Type IfcBuildingElementPart
Unique Id 3fvVrvJ8b3IhdTsmiaKbFc
IFC Id 308685
Name ISOLANT
Description -Unset-
Owner History
ObjectType Insulation layer
Element Tag -Unset-
Associations
MaterialLayerSet -Unset-
MaterialLayer GR 32 Roulé revêtu kraft
reference 83304
url http://www.isover.fr/doc...
iniesID 241
R 3.15
length 2.7
width 1.2
Thermal Properties 2
Thickness 0.1
IsVentilated -Unset-
Relations
Decomposes 1
RelAggregates OPTIMA MUR 2 (#307196)
Property Sets
eveBIM PSet 2
eveBIM_Quantities 3
GR 32 Roulé revêtu kraft_83304_Count 2
GR 32 Roulé revêtu kraft_83304_Area_... 8.6425
GR 32 Roulé revêtu kraft_83304_NbLay... 1
Local Placement
PlacementRelTo OPTIMA MUR 2 (#307196)
RelativePlacement 3D
Representation
Name -Unset-
Description -Unset-
Geometries 1
Previous
Selection History
Next




FICHE PRODUIT
RETOUR
FERMER
GR 32 Roulé Revêtu Kraft
Panneau semi-rigide en laine de verre à dérouler de forte résistance thermique, revêtu d'un pare-vapeur en kraft quadrillé sur une face
DOMAINE D'APPLICATION ET SOLUTIONS
Solutions d'isolation COMBLES AMENAGES
Isolation thermique traditionnelle en double couche pour charpentes traditionnelles
Solutions d'isolation thermique et acoustique PAR L'INTERIEUR
Isolation thermo-acoustique derrière une contre cloison maçonnée
Isolation thermo-acoustique sous ossature métallique et plaque de plâtre
Solutions d'isolation CLOISONS EN RESIDENTIEL
Isolation thermo-acoustique de cloison de séparation de locaux chauffés et non chauffés
AVANTAGES
CARACTERISTIQUES
LA BASE DE DONNÉES FRANÇAISE DE RÉFÉRENCE SUR LES CARACTÉRISTIQUES ENVIRONNEMENTALES ET SANITAIRES DES PRODUITS DE CONSTRUCTION
TABLEAU DE BORD DE LA BASE
TROUVER UN PRODUIT
DOCUMENTS
LEXIQUE
F.A.Q.
<< Retour
SAINT-GOBAIN ISOVER
Panneau de laine de verre GR 32 REVETU KRAFT épaisseur 100 mm
Informations Générales
Indicateurs Environnementaux
Santé
Confort
Documentation
Indicateurs d'impacts environnementaux
Valeur total cycle de vie/UF par annuité
Valeur total cycle de vie/UF pour toute la DVT
1 Consommation de ressources énergétiques
Energie primaire totale (MJ) 2,220E+000 1,110E+002
Energie renouvelable (MJ) 1,878E-001 9,390E+000
Energie non renouvelable (MJ) 2,020E+000 1,010E+002
Energie primaire procédé (MJ) Non renseignée Non renseignée
2 Epuisement de ressources (ADP) (kg eq. Antimoine) 5,200E-004 2,600E-002
3 Consommation d'eau totale (L) 7,800E-001 3,900E+001
4 Déchets solides
Déchets valorisés (total) (kg) 5,760E-003 2,880E-001
Déchets éliminés
Déchets dangereux (kg) 2,560E-004 1,280E-002
Déchets non dangereux (kg) 6,300E-002 3,150E+000
Déchets inertes (kg) 3,540E-003 1,770E-001
Déchets radioactifs (kg) 1,576E-005 7,880E-004
5 Changement climatique (kg eq. CO2) 6,480E-002 3,240E+000
6 Acidification atmosphérique (kg eq. SO2) 4,600E-004 2,300E-002
7 Pollution de l'air (m³ d'air) 1,054E+001 5,270E+002
© Copyright CSTB - Energie, Santé et Environnement 2009
Nom
Valeur
Root Information
IFC Type IfcBuildingElementPart
Unique Id 0RmmyE4uP96Q67sHI6xQVT
IFC Id 310608
Name ISOLANT
Description Calepinage - ISOLANT part of OPTIMA MUR sys
Owner History
Object Type ISOLANT
Element Tag -Unset-
Associations
MaterialLayerSet -Unset-
MaterialLayer GR 32 Roulé revêtu kraft
url http://www.isover.fr/doc/catalogue/2040.html
reference 83304
length 2.7
width 1.2
R 3.15
Inies_Id 241
Thermal Properties 2
Thickness 0.1
IsVentilated -Unset-
Relations
Decomposes 1
Property Sets
eveBIM PSet 3
eveBIM_Quantities 3
Local Placement
PlacementRelTo OPTIMA MUR 4 (#307646)
RelativePlacement 3D
Representation
Name -Unset-
Description -Unset-
Geometries 1

Make it collaborative !

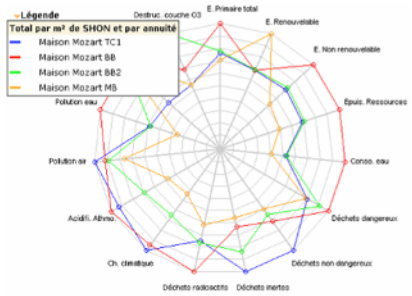
- The coupling of this extended BIM with simulation tools is instrumental in addressing complex and multidisciplinary issues related to the sustainable construction.

Configuration tools

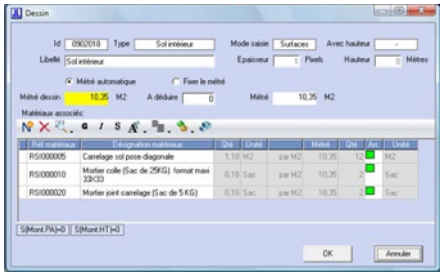
CAD

...

Thermal simulations



Environmental impact



Costs and descriptions

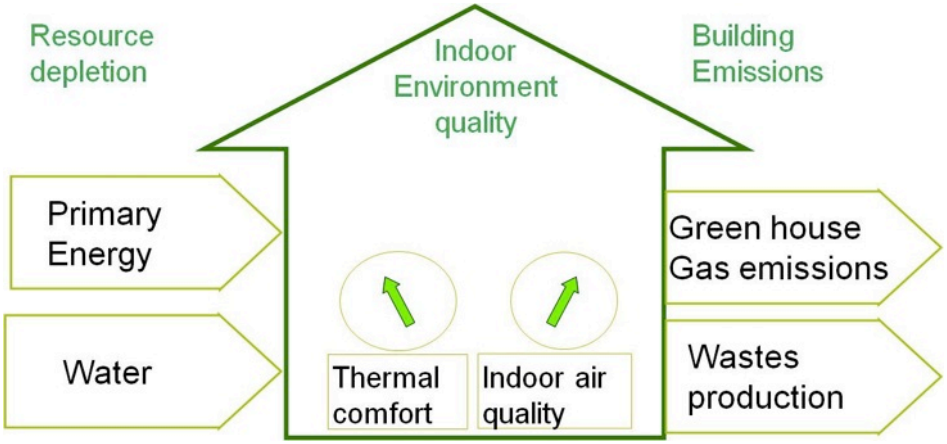
Make it easy and affordable !

- Association of technologies for automatic creation of urban high-resolution 3D models based on photographies

- ACUTE3D : A spin-off created from the outcomes of a Research project joining CSTB, École Nationale des Ponts et Chaussées, & INRIA

Toward international roadmaps : SBA & BIM (1/2)

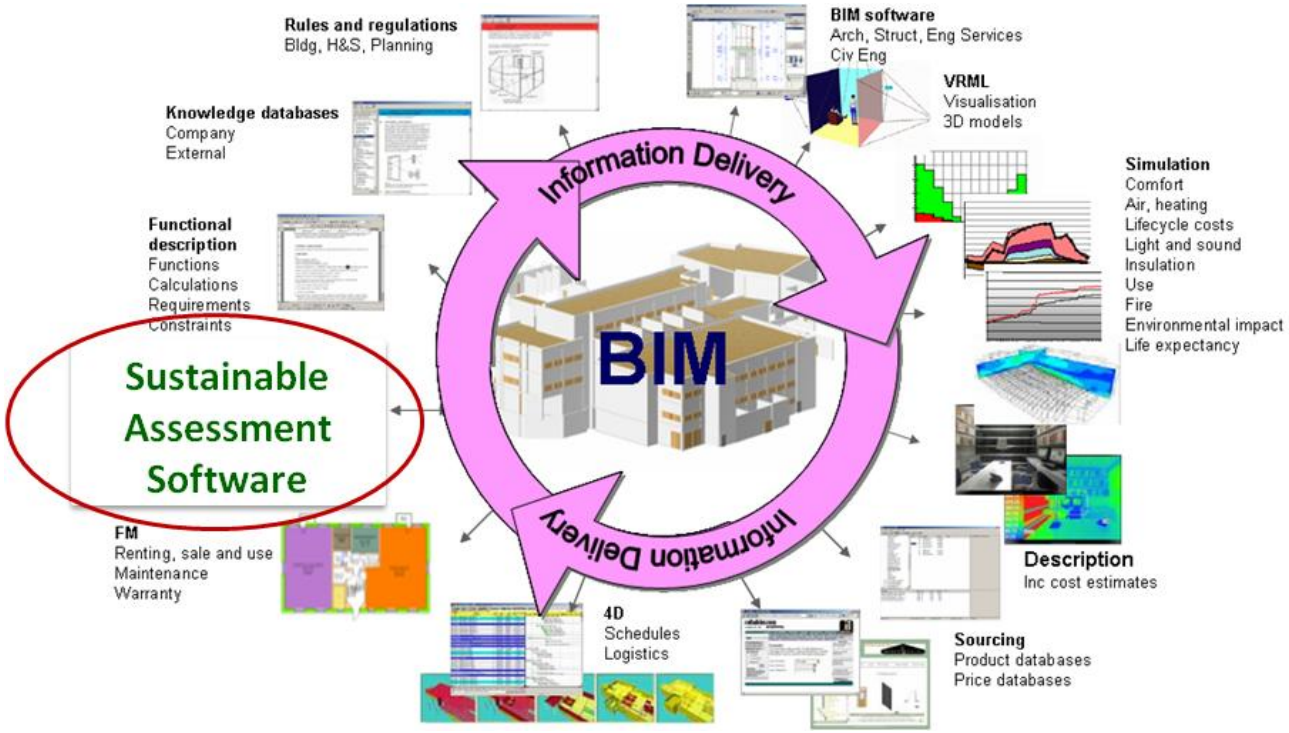
- How ***SBA Core metrics*** can be implemented in BIM/ CAD tools ? *(how BIM/CAD tools can provide input data for LCA)*



Before use stage					Use Stage				End of Life Stage			
Product Stage			Construction Stage							Disposal Stage		
Raw Material Process	Transport	Manufacturing	Transport	Construction Installation Process	Operation of building-incorporated services	Operation of non building- incorporated appliances	Maintenance, repair and refurbishment	Transport (of people)	Deconstruction	Transport	Recycling, reuse and energy recovery	Waste Disposal

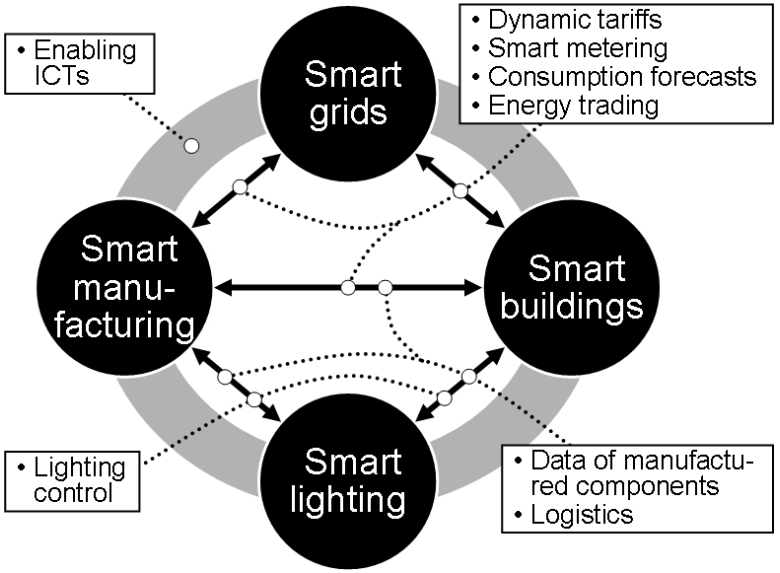
SBA & BIM (2/2)

- An analysis presenting LCA modules integrated with commercial product model based building design software
- Identification and analysis of what is expected to be delivered by the ongoing EC projects in this domain



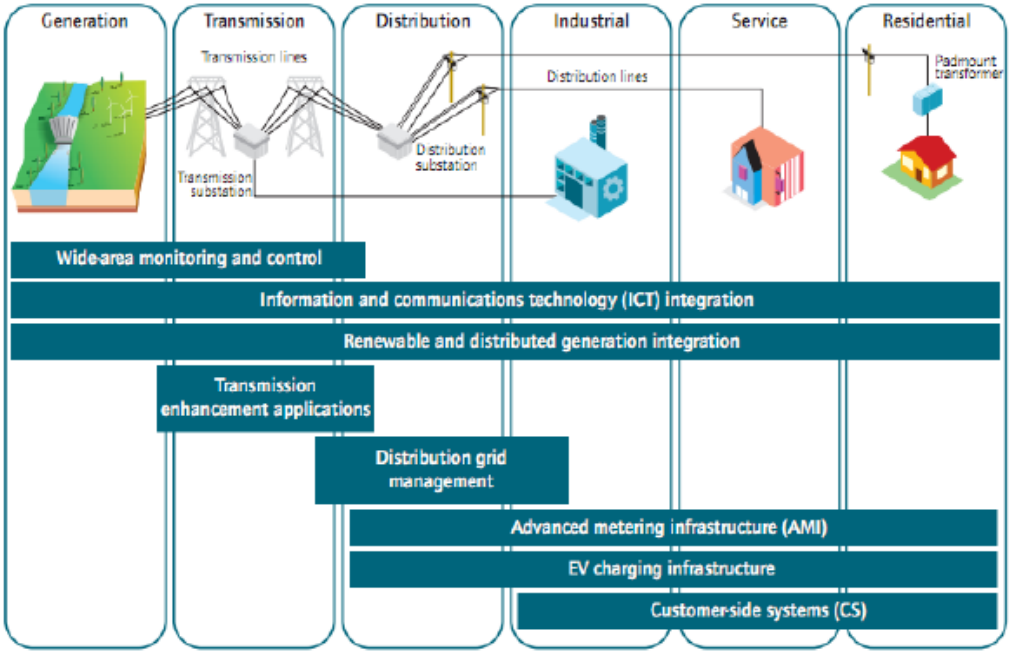
Toward international roadmaps : REViSITE (1/2)

- REViSITE is working for the European Commission to identify cross-sector research priorities covering the domains of **grids, manufacturing, buildings and lighting, for Europe in the area of ICT for Energy Efficiency (ICT4EE)**.



REViSITE (2/2)

- Research areas of high priority:
  - Technical interoperability and standardisation
  - Design for energy-efficiency in all sectors
  - Metrics and methods for quantitative assessment of ICT impacts
  - The difficulty in substantiating the casual connection between research and technical development themes
  - The importance of data visualisation and decision support particularly in the usage phase of each sector

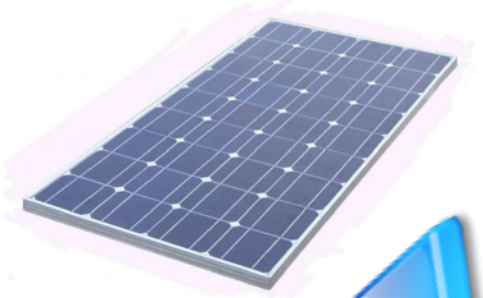


ICT application domains in the smart grid

(source: IEA, 2011)

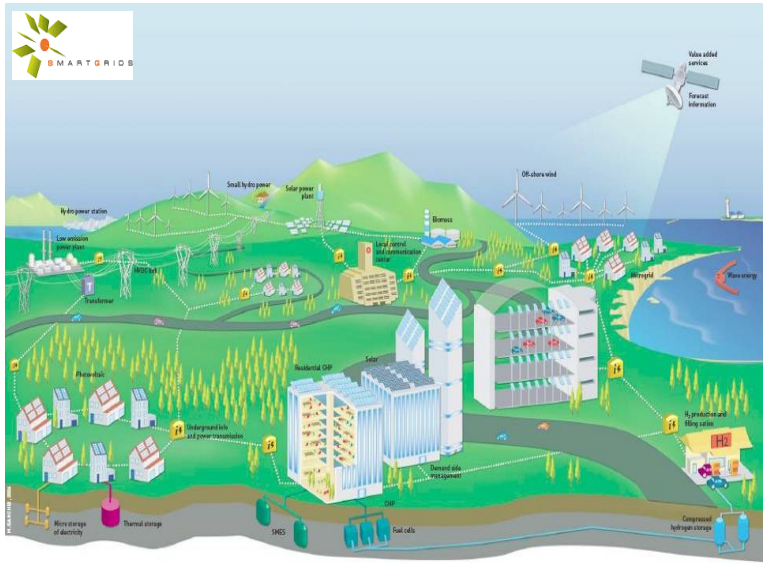
Perpective : integration of scales

From the materials/components...



...to the buildings...

to the urban areas...



A single MOTTO:

Make it happen !

Grands Moulins de Pantin – BNP PARIBAS Immobilier / Architecte : REICHEN et ROBERT & Associés

Thank you for your attention

carole.le-gall@cstb.fr

CSTB
le futur en construction