CSTB
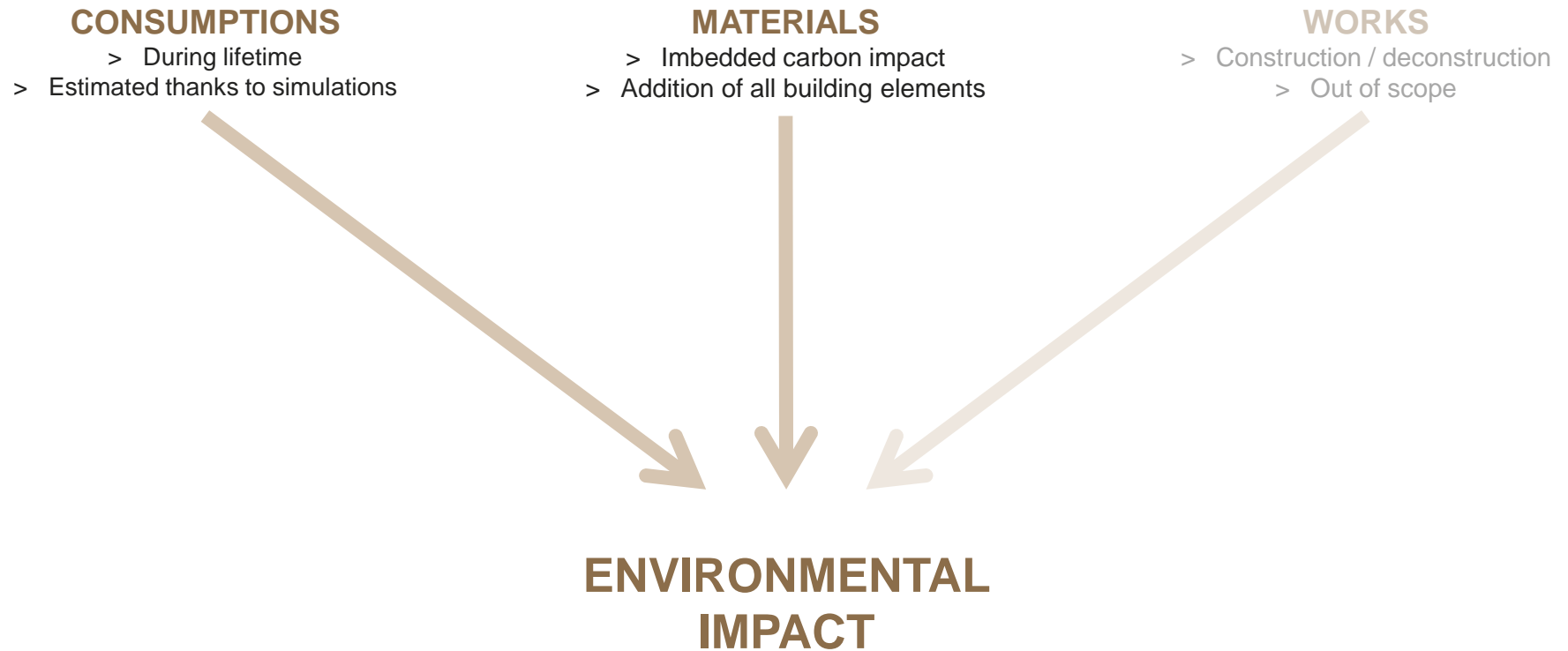*le futur en construction*

Life Cycle Assessment
with the Energy ADE
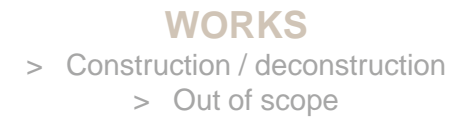
December 6th, 2017 – Lydia TRZCINSKI

Life Cycle Assessment

CONSUMPTIONS
> During lifetime
> Estimated thanks to simulations

MATERIALS
> Imbedded carbon impact
> Addition of all building elements

WORKS
> Construction / deconstruction
> Out of scope

ENVIRONMENTAL IMPACT

Life Cycle Assessment

CSTB
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THERMAL ZONES

COMPONENTS

CONSUMPTIONS
> During lifetime
> Estimated thanks to simulations

MATERIALS
> Imbedded carbon impact
> Addition of all building elements

WORKS
> Construction / deconstruction
> Out of scope

ENVIRONMENTAL IMPACT

ADE Energy structure : today

CSTB
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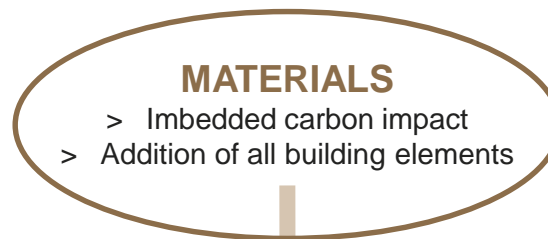
```
┌─────────────────────────┐
│      CITY OBJECT        │
└─────────────────────────┘
            │
            ▼
┌─────────────────────────┐
│        BUILDING        │────┐
└─────────────────────────┘    │
            │                  ▼
            │         ┌──────────────────────┐
            │         │   BLDG BOUNDARY      │
            │         └──────────────────────┘
            ▼
┌─────────────────────────┐
│      THERMAL ZONE      │
└─────────────────────────┘
            │
            ▼
┌─────────────────────────┐
│    THERMAL BOUNDARY    │
└─────────────────────────┘
            │
            ▼
┌─────────────────────────┐
│       COMPONENT        │
└─────────────────────────┘
```
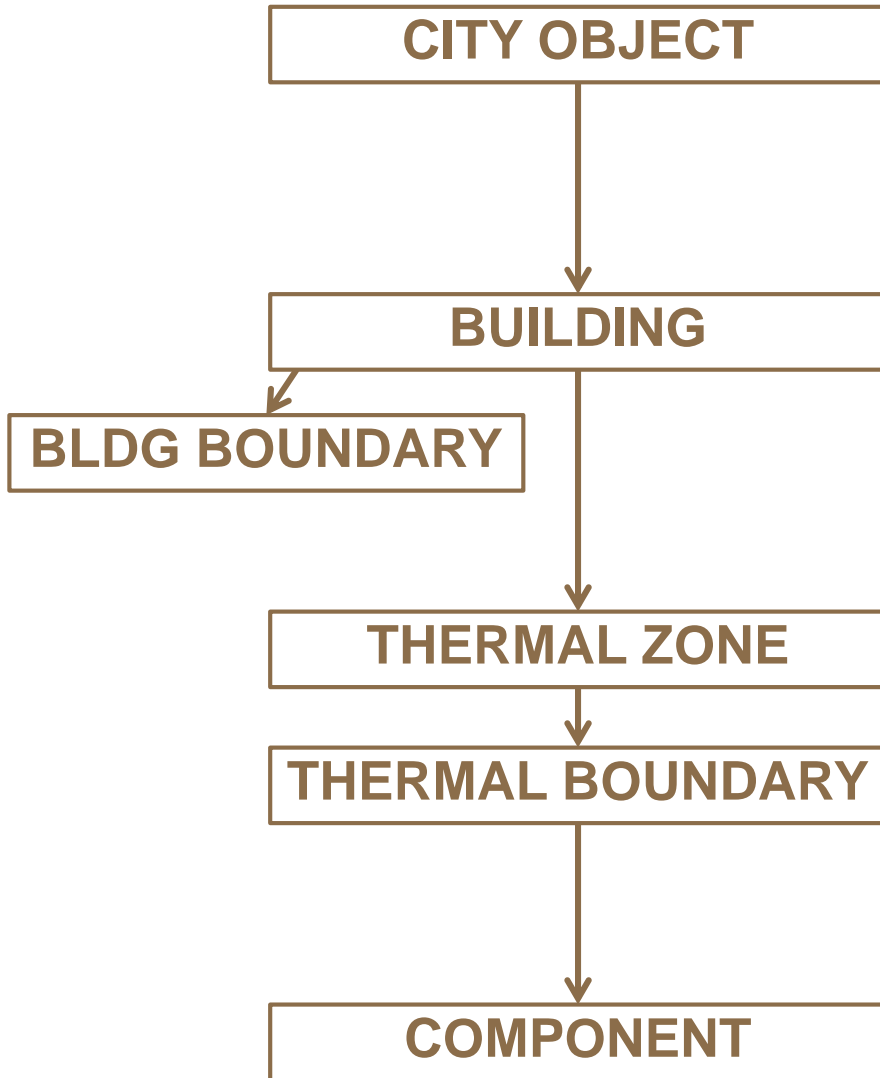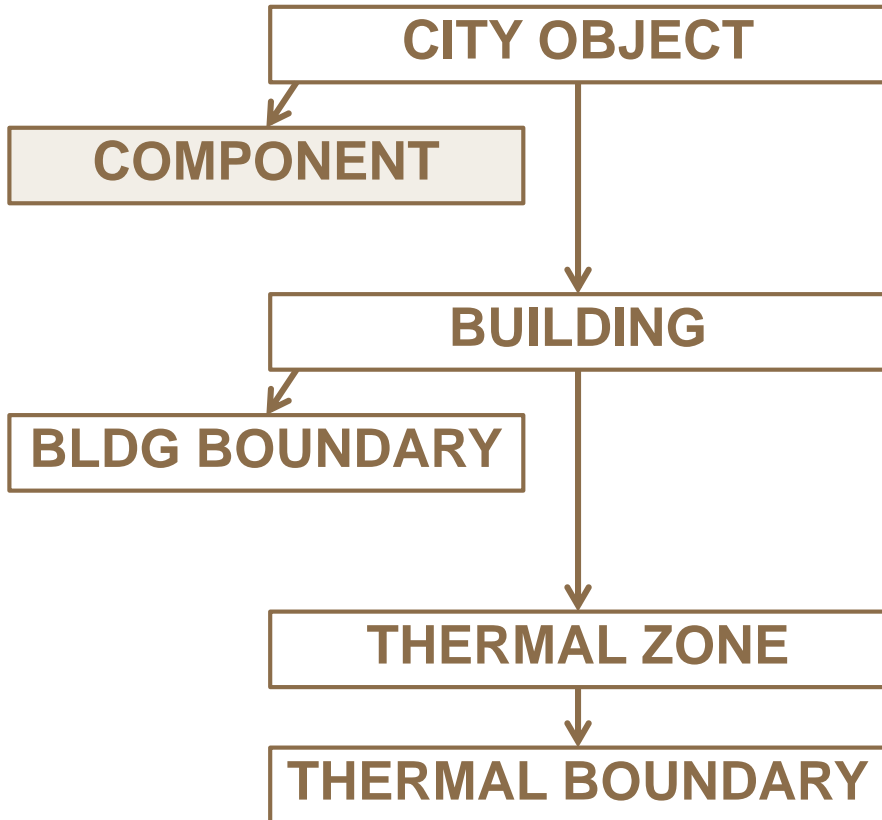
PROBLEM ENCOUNTERED
> Thermal zoning is a representation used for simulation, not the reality…
> What if the zoning changes? (need for complete remodeling of thermal boundaries and properties)

PROBLEM ENCOUNTERED
> What if the zoning changes?
> How to account for other material quantities?
> How to link to material / product DBs ?

ADE Energy structure : CSTB internal solution

CSTB
le futur en construction

```
┌─────────────────────────────────┐
│          CITY OBJECT            │
└─────────────────────────────────┘
     │                  │
     ▼                  │
┌──────────────────┐    │
│    COMPONENT     │    │
└──────────────────┘    │
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          ┌─────────────────────────┐
          │        BUILDING         │
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             │               │
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┌─────────────────────┐      │
│    BLDG BOUNDARY    │      │
└─────────────────────┘      │
                             ▼
                ┌─────────────────────────┐
                │      THERMAL ZONE       │
                └─────────────────────────┘
                             │
                             ▼
                ┌─────────────────────────┐
                │    THERMAL BOUNDARY     │
                └─────────────────────────┘
```

CSTB SOLUTION

> Component types = surface, layered, opening, …

> Link LCA information to any cityObject :
> Building > overall quantities
> Blg boundary > thermal zone redefinition
> Thermal zone > internal and boundary
> Systems, etc > account for those too !

> Have a dynamic reference to an external DB of component LCA information (at material, but also product level)

In conclusion : issues / wishlist

**DISSOCIATE MATERIALS/PRODUCTS
FROM THERMAL ZONES**

**MANAGE MATERIAL/PRODUCT INFO
IN REFERENCE TO AN EXTERNAL DB**