

# The energy and circular transition in the built environment; new business opportunities in the Netherlands

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# Introducing Saxion UAS

Enschede, Deventer and Apeldoorn

± 27.000 students

± 2.800 employees



Research group:

Sustainable Areas and Soil Transitions (SAST)



# Introducing the transitions in the built environment

## Energy transition



### Trias Energetica

1. Reduce the need for energy
2. Make use of renewable
3. ~~Fossil fuels are used as effective and efficient as possible~~

## Circular transition

Linear economy



Circular economy



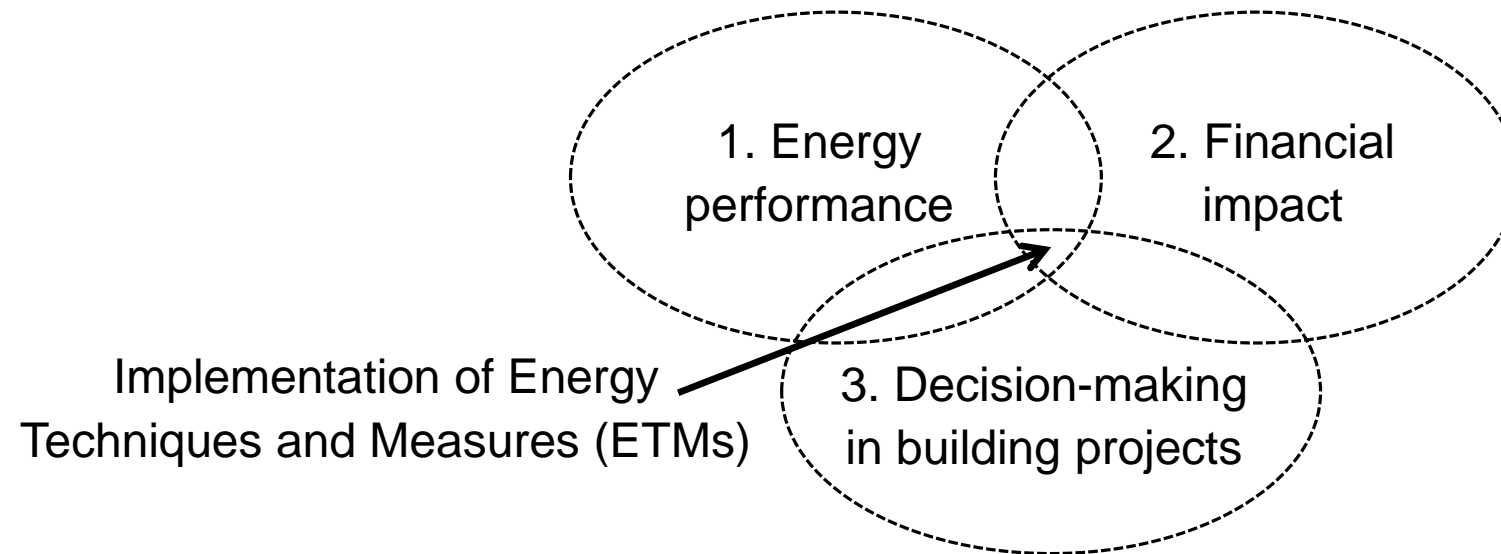
# Energy transition and circular transition are intertwined!



# Research design regarding the adoption of ETMs

Main research objective:

*To develop a framework to assess the implementation potential of ETMs on the basis of their effects on and for stakeholders in residential building projects.*



# Introducing Dutch residential real estate



## Introducing Dutch residential real estate



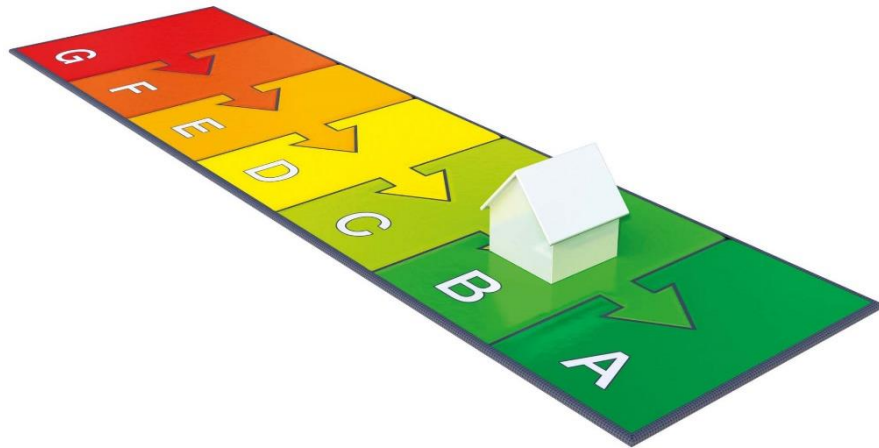
# Introducing Dutch residential real estate





## Performance indicators

Approximately eight million dwellings  
All dwellings have an energy label to  
express their energy performance

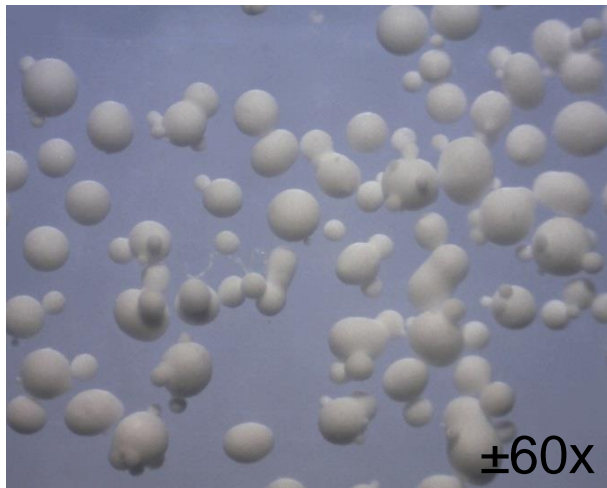


New buildings need to comply with a  
certain environmental profile

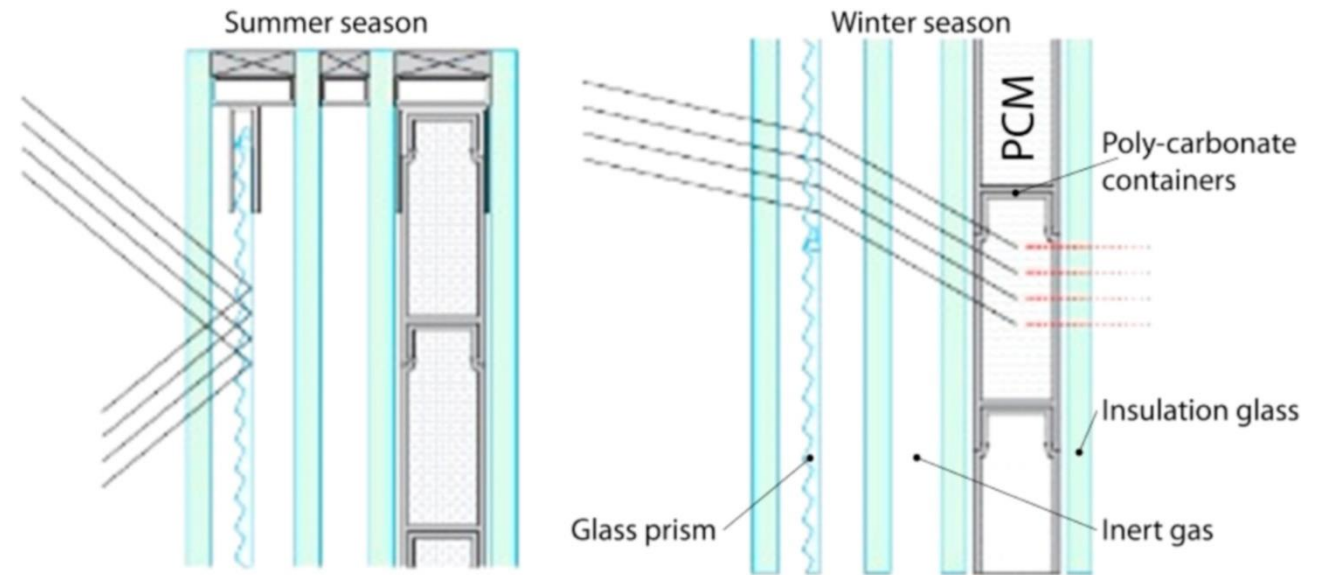


# 'Innovative' energy technique 1: Phase Change Materials

Phase Change Materials can act as a thermal battery at a particular

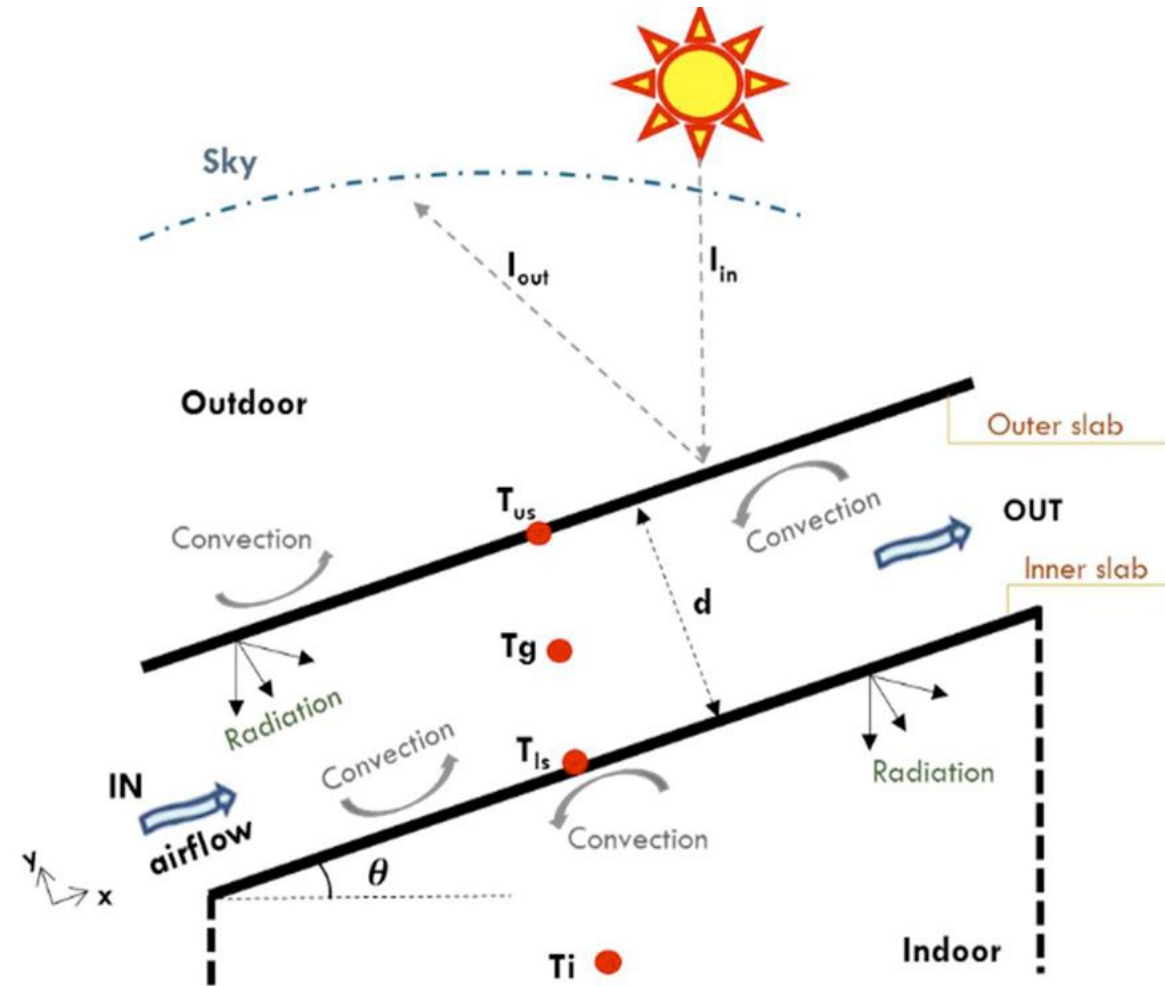


(Entrop, 2013)



(Silva, Vicente, Rodrigues, 2016)

## 'Innovative' energy technique 2: Double roof construction



(Omar, et al. 2017)



A system, called Roofclix, was developed for flat roof systems.



## 'Innovative' circular technique 1: material depot



# 'Innovative' circular technique 1: material depot



# 'Innovative' circular technique 1: material depot



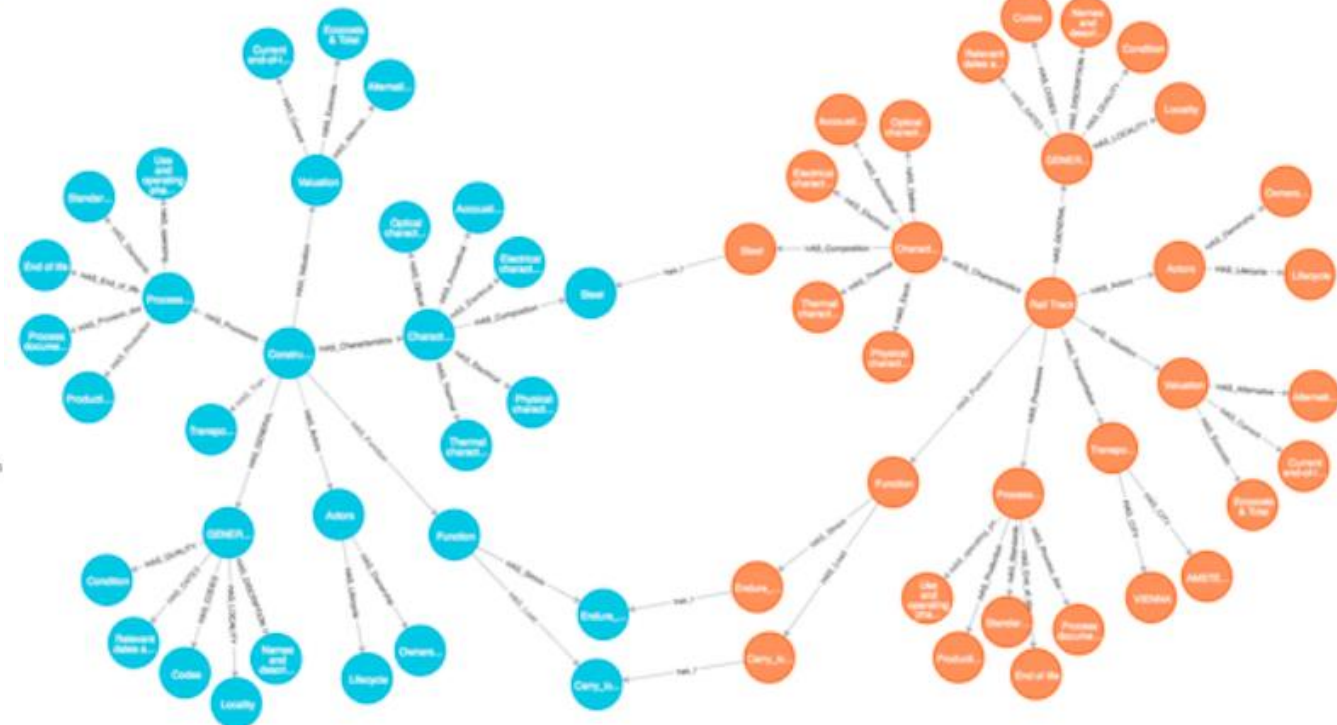
# 'Innovative' circular technique 2: online matching and market tools

Matching supply and demand with a broader scope for functionalities.

The screenshot shows the Apeldoorn market platform interface. At the top, there are navigation links for 'MARKTPLAATS' and 'PRODUCT OVERZICHT', along with a language selector set to 'Nederlands'. Below the navigation is a search bar with the placeholder text 'Productnaam' and a search icon. There are two buttons: 'PRODUCT TOEVOEGEN' and 'PRODUCT AANVRAGEN'. Below the search bar are two filter buttons: 'Rasterweergave' and 'Kaartweergave'. The main content area is titled 'Recent aanbod' and displays three product listings:

- paneel getuidsscherm**: Marshallweg, Leeuward... 5 dagen geleden, 50 Stuk(s), € 50 / EUR (€), + Reserveren
- Tegel**: Amhem goederen opstel... 5 dagen geleden, 30 Stuk(s), € 0 / EUR (€), + Reserveren
- betonnen kabelkoker / goot afm.....**: Lage Zwaluwe, Nederland 3 maanden geleden, 10, € 0, + Reserveren

## Alle producten



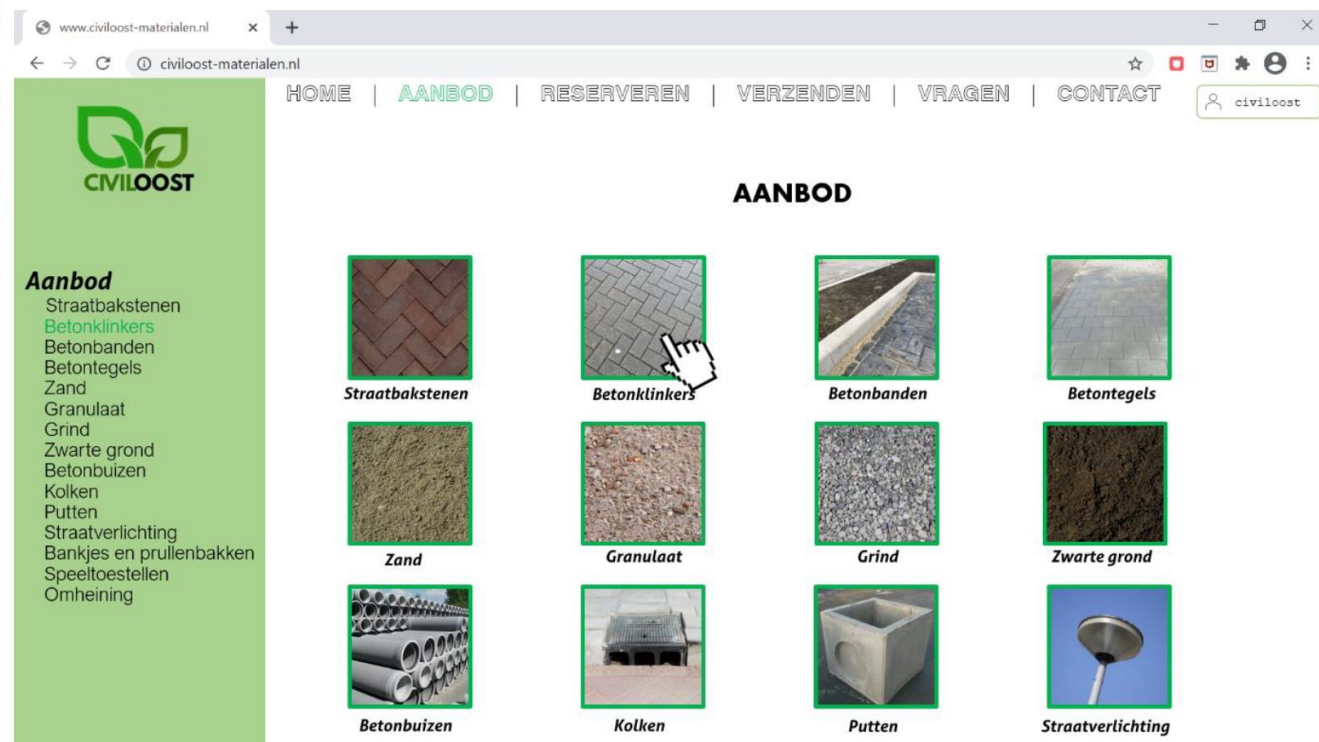
# 'Innovative' circular technique 2: online matching and market tools



## GRIFFIERSVELD APELDOORN



'Het platform voor vraag en aanbod van gebruikte materialen in de openbare ruimte'





## 'Innovative' circular technique 2: online matching and market tools

**duspot** HOME CIRCULARITEIT PLATFORM DOELGROEP CONTACT DuSpot portaal

Vrijkomende bouwmaterialen hergebruiken binnen projecten en aanbestedingen

DuSpot is een platform voor overheden en aannemers. Wij matchen vraag en aanbod van vrijkomende bouwmaterialen in verschillende fases van een project met elkaar. Dat doen we op gebruikersvriendelijke en overzichtelijke wijze

- Voor aannemers
- Voor overheden
- Voor ingenieursbureaus
- Voor particulieren & hoveniers

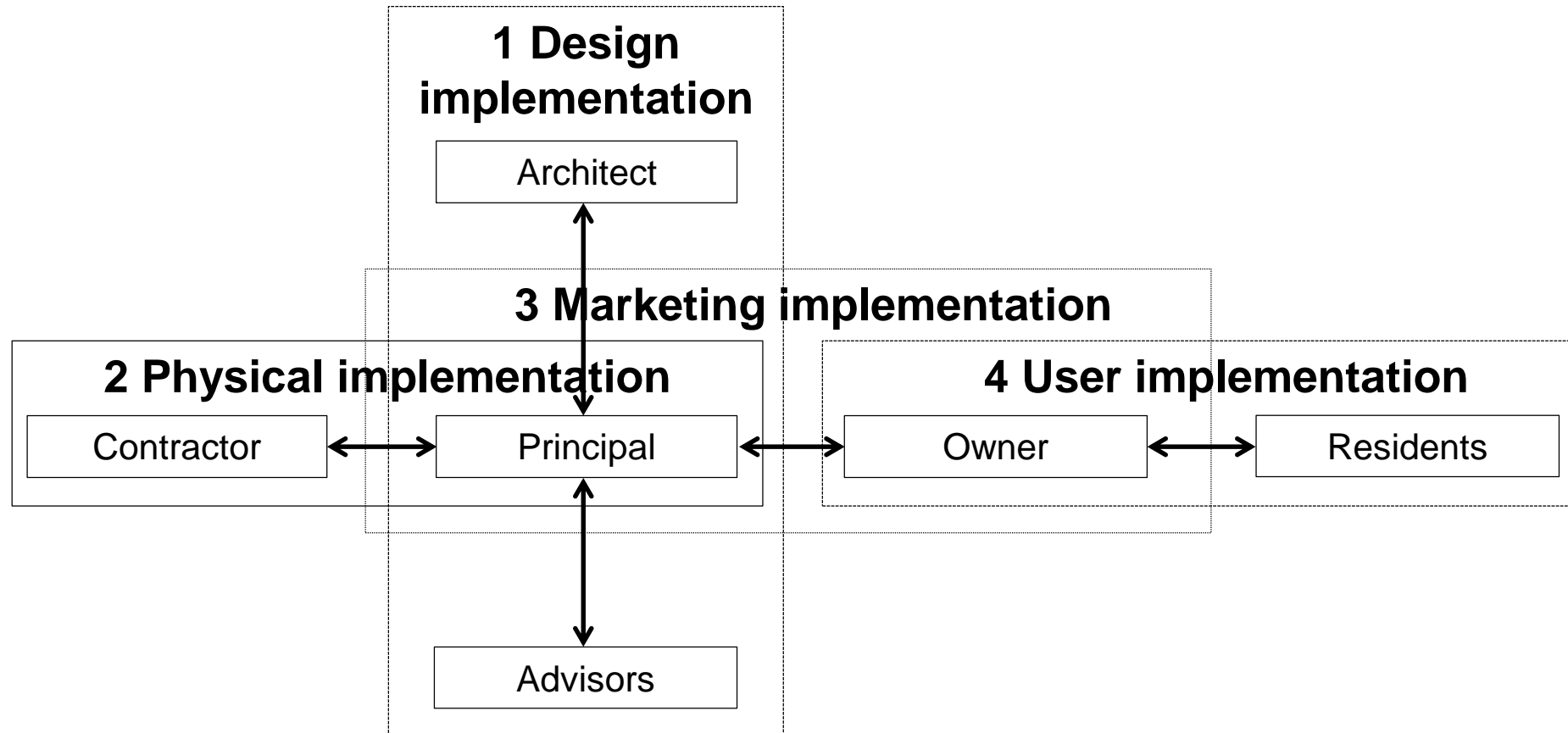
Matching tool for:

- governmental organisations
- engineering firms
- contractors
- housing associations

## Preliminary conclusions and recommendations

- The energy and circular transition changes the mindset of many; often new techniques and measures are introduced and tested to lower the environmental impact of the construction industry;
- Policies seem to be a 'carrot' to the innovators and early adopters;
- Many seem to regard the Building Code as a 'stick' for the late majority and laggards;
- However, that same Building Code (as well as some other policies, laws and regulations) with its accompanying standards and norms does also form a threat or barrier to some innovations;
- Business opportunities might be most vital, if these threats or barriers are identified early, e.g. by preparing in four steps your innovative energy or circular technique or measure for implementation

# Implementing a novel energy or circular technique; a suggestion



**Cám ơn vì sự quan tâm của bạn!**

**Thank you for your attention!**

