

Goodbye Passive House, Hello Energy Flexible Building?

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Outline

- Introduction:
 - European policy drivers
 - Energy flexible buildings
- Research approach:
 - Vision formation for passive house network
 - Questionnaire, Focus group, Business model exercise
- Research results
- Conclusion

Introduction: European policy drivers

- Energy Performance of Buildings Directive (EPBD recast, 2010):
 - Reach nearly-zero energy buildings
- Low Carbon Economy Roadmap (EU, 2011):
 - Reduce CO₂ emissions in construction by 88-91% (2050 compared to 1990)
- Energy Efficiency Directive (EED, 2012):
 - Mobilize investment in renovation of national building stock
- New Plan for the Energy Consumer (2016):
 - Enabling consumers to better participate in energy markets

Introduction: Energy Flexible Buildings

- Energy flexible buildings (IEA EBC Annex 67):
 - The Energy Flexibility of a building is the ability to manage its demand and generation according to local climate conditions, user needs and grid requirements.
 - Increased demand side management/load control
 - Demand response based on the requirements of the surrounding grids

When buildings become prosumers of electricity and heat (or other energy vectors) in new energy systems, will this affect the adoption of passive building concepts?

Research approach

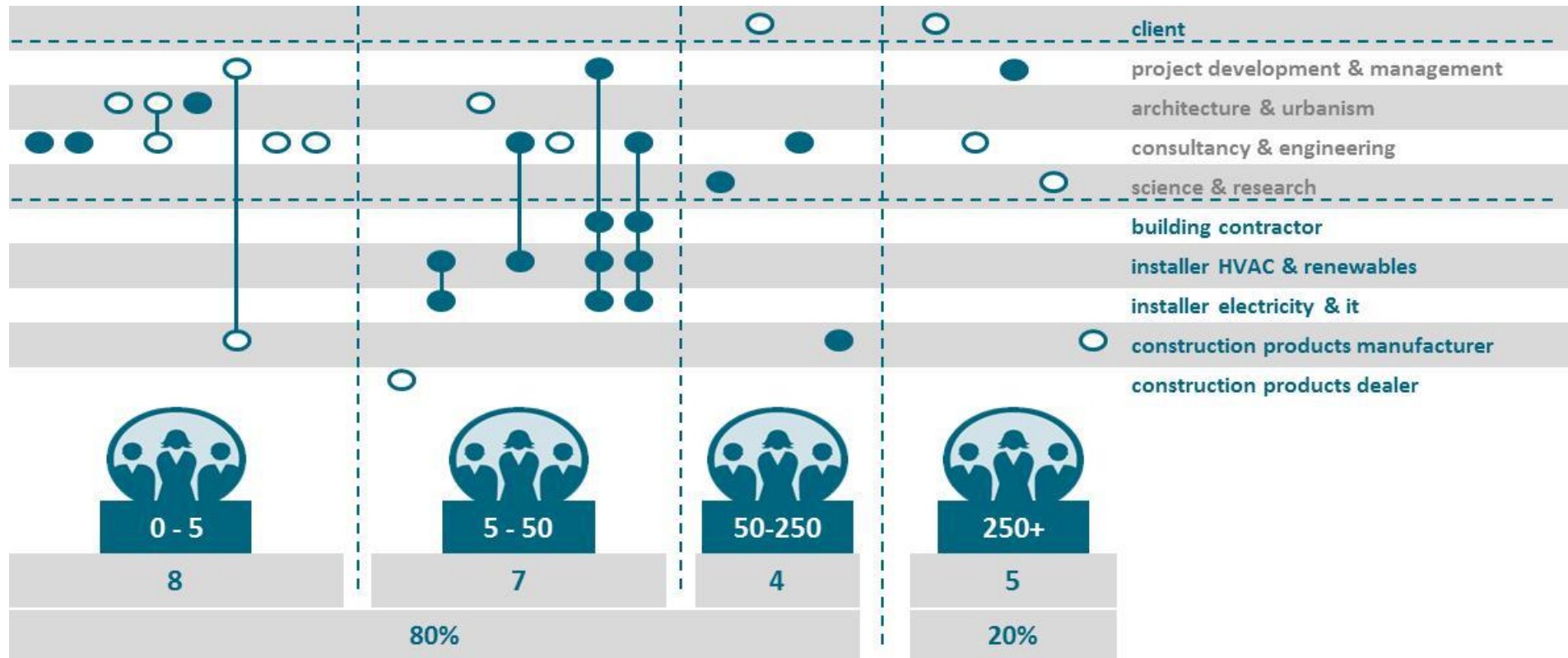
- Vision formation for a passive house network:
 - Platform (multidisciplinary network) reaching out to industry, customers and policy
 - Passiefhuis-Platform vzw (independent non-profit organisation, Belgium)
 - Mission to spread knowledge on how to reach high energy savings in buildings
 - Activities include innovation development, training of professionals, consultancy, passive house certification, research projects,..
 - Promotion of passive houses versus zero-on-the-meter
 - Influence of energy storage when promoting high energy saving
 - Influence of low temperature district heating grid on specifying low heating demand in buildings.

Research approach

- Questionnaire:
 - understand the level of knowledge market actors have about energy flexible buildings (Expert day, Mechelen, 11 June 2015)
- Focus group:
 - expert discussion on energy flexible buildings (Passive House building fair, Brussels, 11 September 2015)
- Business model development exercise:
 - understand the members' needs regarding energy flexible buildings using the Osterwalder & Pigneur canvas (PHP Advisory board meeting, Deinze, 7 December 2015)

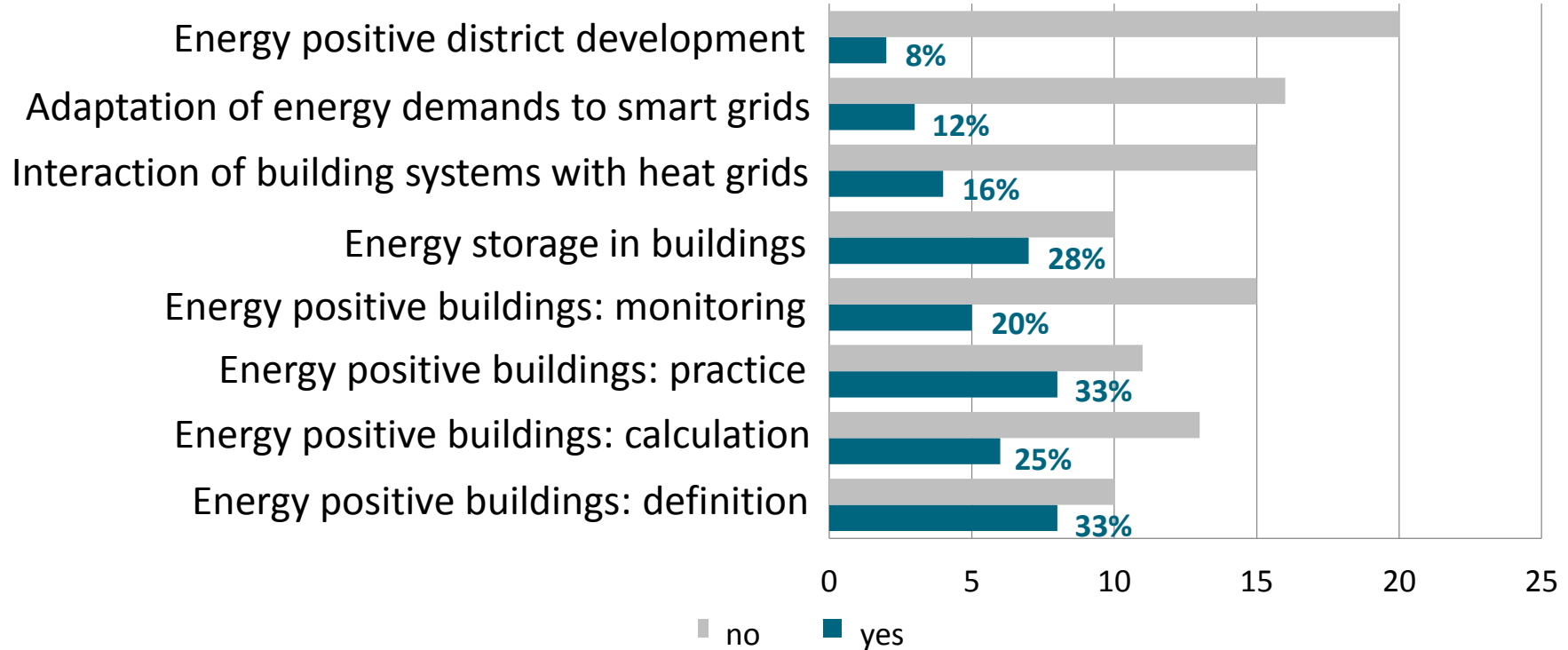
Questionnaire results (24/80 respondents)

WHAT ARE THE **CORE ACTIVITIES** OF YOUR ORGANISATION/ COMPANY?



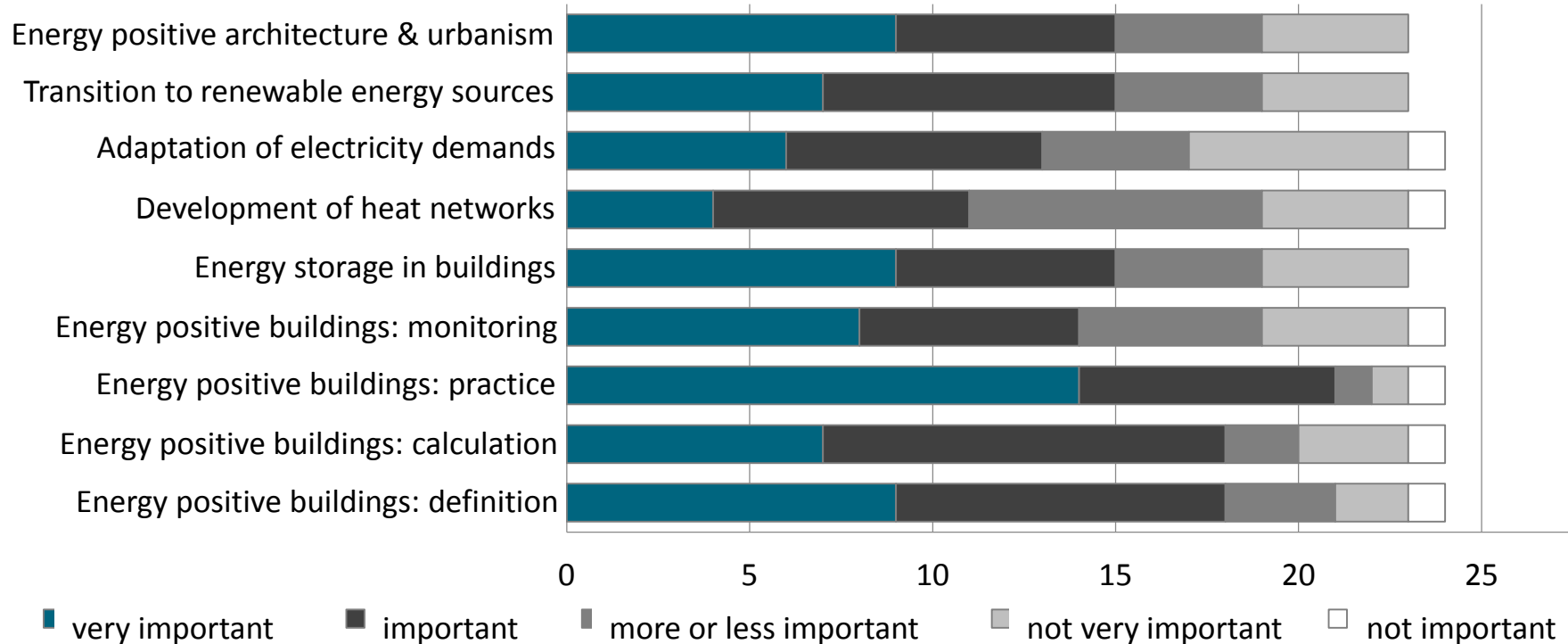
Questionnaire results

WHAT PRACTICAL EXPERIENCE DO YOU HAVE WITH ENERGY FLEXIBLE OR ZERO-ENERGY BUILDINGS?



Questionnaire results

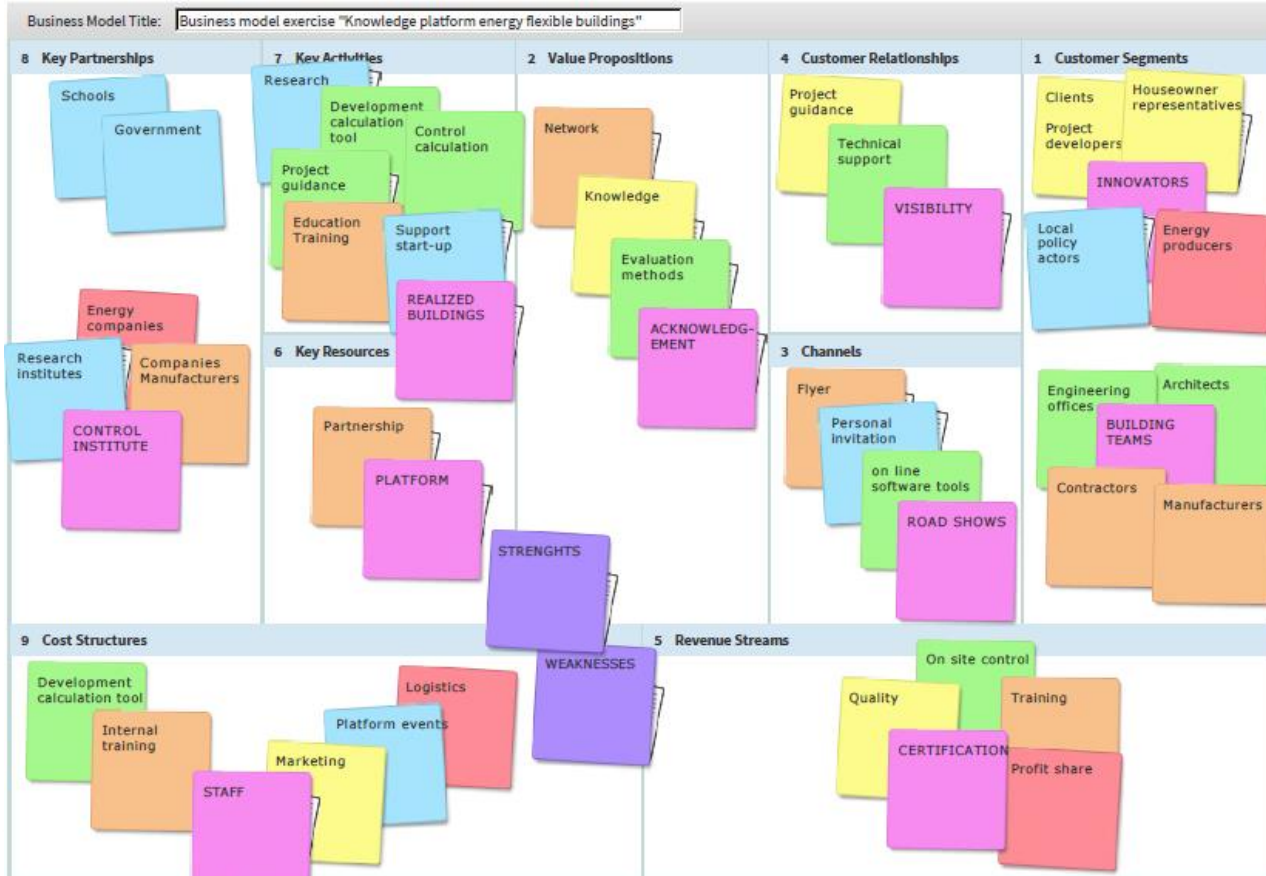
WHAT **KNOWLEDGE OR INNOVATION** DO YOU STILL SEEK TO REALIZE ENERGY FLEXIBLE BUILDINGS?



Focus group results

- Which market segment is relevant?...
 - “Energy storage capacity and excess heat is higher in industry, using the building as storage is secondary”
 - “Energy flexibility using co-generation is already present in greenhouse farming”
 - “Energy flexibility will first be implemented in non-residential buildings”
 - “A central heating in a building can easily be replaced by a connection to the heat grid”
- How to control energy flexibility?...
 - “..there will be negative energy prices and buildings will be paid to store energy”
 - “Hydrogen storage only becomes interesting when energy prices are negative”
 - “Energy flexible buildings make no sense if there are no smart meters installed”
 - “Smart grid is a bad name as the grid is not smart; the coupling of energy users is smart”

Business model development exercise



Conclusion

There is a positive attitude in the passive house sector to develop a market for energy flexible buildings.

An important challenge is to develop new knowledge.

From networks of innovators (what can be defined? calculated? certified?)

From demonstration projects (what are “good” concepts?)

From grids (how can buildings act as storage component?)

From building managers and end users (what motivates them?)

Further research: IEA EBC Annex 67.

Thank you

- ✓ IEA EBC Annex 67 Energy Flexible Buildings
- ✓ Netherlands Enterprise Agency (RVO)
- ✓ Passiefhuis-Platform (**now named: Pixii**)

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