Drivers and barriers in high ambition retrofitting of non-residential buildings.

Trond Haavik
(MBA)

Experiences from decision-making processes in projects from six countries.

Findings from Subtask B - IEA SHC Task 47

Beijing, 14.10.14

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enova

segel

The Jostedal glacier is diminishing !

AGENDA

1. Scope of work in Subtask B – Market & Policy Issues
2. Building stock analyses pointing out the potential?
3. Study of decision making processes
4. Recommendations

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OBJECTIVES FOR SUBTASK B

- Identify segments with high potential for energy efficiency savings and which type of owners are most likely to go for such projects.
- Identify the most important barriers and driving forces in decision making processes
- Develop knowledge about which boundary conditions are important to overcome the barriers
- Increase the understanding of how improved NEB's increase the value of the building

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Building Stock Analyses

Few complete analyses

- **Europe:** Europe's Buildings under the Microscope (2011) BPIE
- **Denmark:** Building stock analysis – Danish non-residential buildings, (2013) SBI
- **Australia:** Baseline Energy Consumption and Greenhouse Gas Emissions In Commercial Buildings in Australia, (2012), COAG
- **Norway:** Potential and barrier study in Norwegian non-residential buildings, (2011) Multiconsult for Enova.
- **Italy:** Building stock analysis of Italian schools, (2013) ENEA

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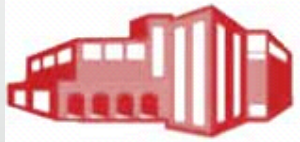
EUROPEAN BUILDING STOCK ANALYSIS

Distribution of m2 gross floor space per building category in EU27+ Switzerland and Norway

	Wholesale & retail 28%	Detached shops, shopping centres, department stores, large and small retail, food and non food shops, bakeries, car sales and maintenance, hair dresser, laundry, service stations (in gas stations), fair and congress buildings and other wholesale and retail.
	Offices 23%	Offices in private companies and offices in all state, municipal and other administrative buildings, post-offices.
	Educational 17%	Primary and secondary schools, high schools and universities, research laboratories, professional training activities and others.
	Hotels & restaurants 11%	Hotels, restaurants, pubs and cafés, canteens or cafeterias in businesses, catering and others.
	Hospitals 7%	Public and private hospitals, medical care, homes for handicapped, day nursery and others.
	Sport facilities 4%	Sport halls, swimming pools, gyms etc.
	Other 11%	Warehousing, transportation and garage buildings, agricultural (farms, greenhouses) buildings, garden buildings.

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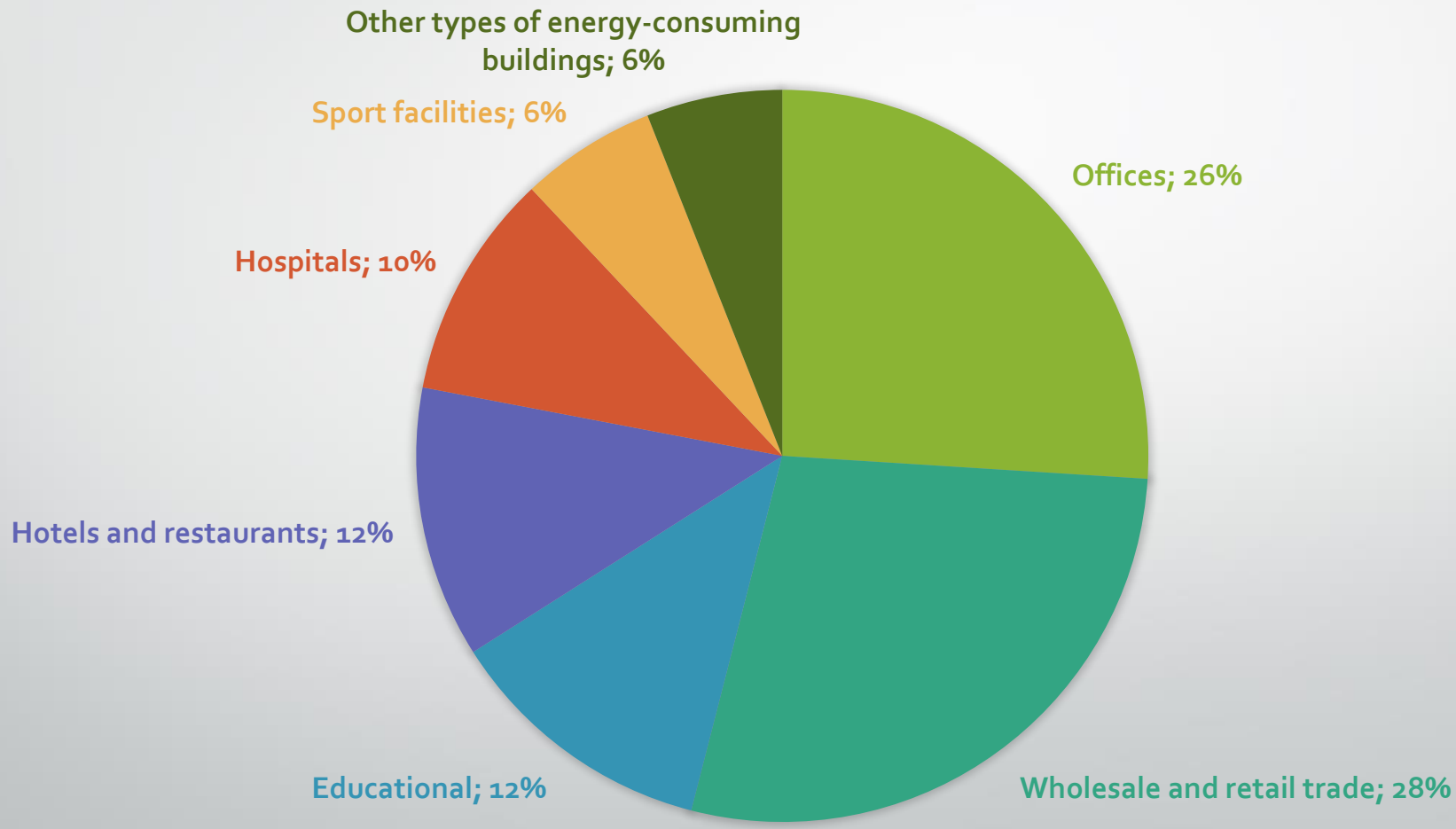
IDENTYFYING POTENTIAL



SHARE OF TOTAL ENERGY USE PER BUILDING TYPE

Realistic scenario for Denmark?

- Scenario analysis for energy savings in the Danish building stock towards 2050:
  - Reduction by 22% in yearly energy consumption for the non residential building stock.
  - Assumptions; additional insulation is added and building components are replaced only when they are worn out, and then upgraded according to the actual building code.
  - The greatest savings are found in offices/commerce and educational/research buildings built before 1960. These buildings can save from 28% to 34% depending the construction year.

  - Source: "Varmebesparelse ved løbende bygningsrenovering frem til 2050" (heat savings by continuously retrofitting towards 2050), Netværk for energirenovering, SBi (2013).

Decision making processes

Learning from demo projects

- 10 projects studied in 6 countries
- Key actors interviewed
- Same template for questionnaire
- Cross analysis

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Office buildings

Monastery

Schools/kindergarten

GOOD INNOVATION PROJECTS
NEED FIVE DISCIPLINES TO SUCCEED

1) There must be a clear **need** as a customer value
2) You need a **value proposition**
3) passionate and **committed people**
4) Innovation **teams**, i.e. collective intelligence
5) Organizational alignment, i.e. **supported by top management** and strategies

Carlson & Wilmot (Innovation: The Five Disciplines For Creating What Customers Want, 2007)

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HOW WERE THE 5 DISCIPLINES COVERED IN THE DEMO PROJECTS?

- √ Holistic understanding of the tenant's and owner's needs – which encompass more than energy efficiency
- √ Added value solutions which fulfilled the needs
- √ One or more enthusiastic persons who are committed to the process
- √ Multi disciplinary teams (also involving owner/tenant)
- √ Supported by the top management and in line with organizations' strategies

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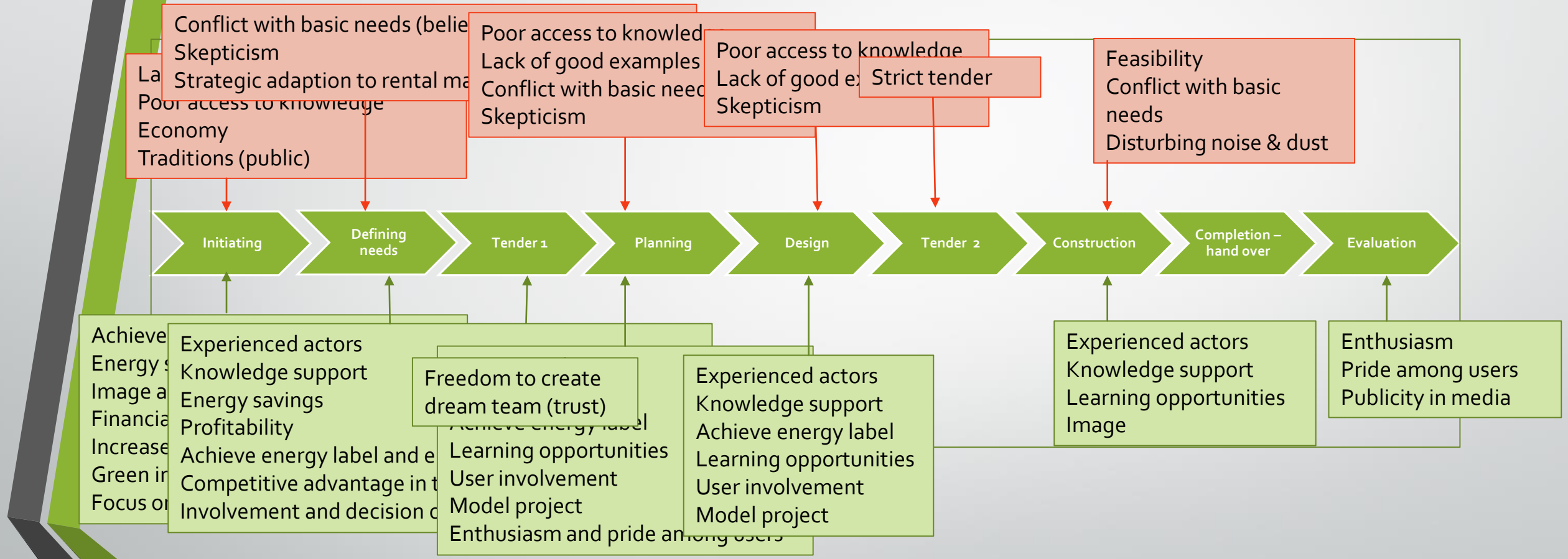
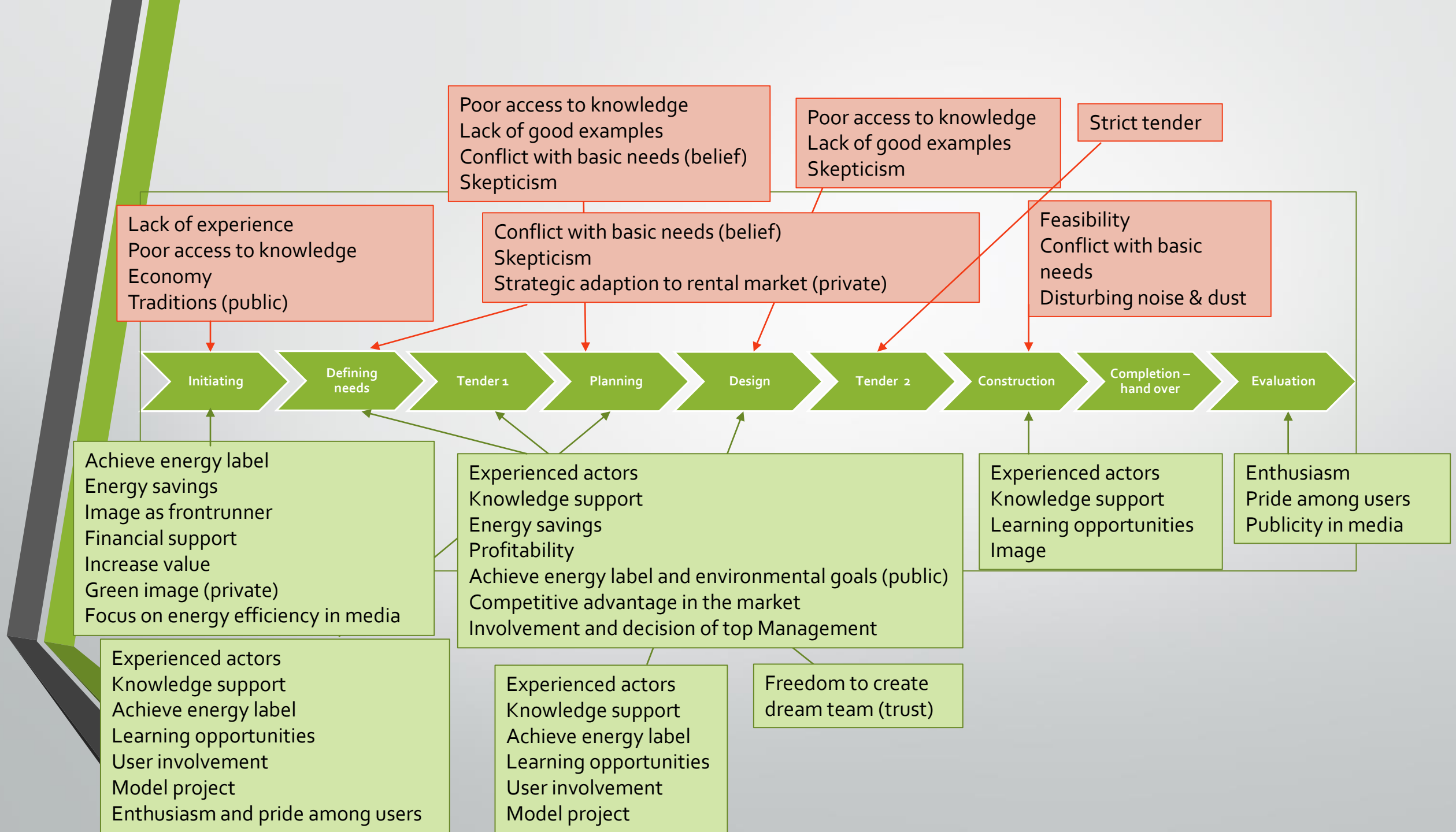
DRIVERS AND BARRIERS IN THE VARIOUS PHASES


Conflict with basic needs (belie
Skepticism
Strategic adaption to rental ma
Poor access to knowled
Lack of good examples
Conflict with basic neec
Skepticism
Poor access to knowledge
Lack of good e
Skepticism
Strict tender
Feasibility
Conflict with basic needs
Disturbing noise & dust
Economy
Traditions (public)
Initiating
Defining needs
Tender 1
Planning
Design
Tender 2
Construction
Completion – hand over
Evaluation
Experienced actors
Knowledge support
Energy savings
Profitability
Achieve energy label and e
Competitive advantage in t
Involvement and decision c
Freedom to create dream team (trust)
Learning opportunities
User involvement
Model project
Enthusiasm and pride among users
Experienced actors
Knowledge support
Achieve energy label
Learning opportunities
User involvement
Model project
Experienced actors
Knowledge support
Learning opportunities
Image
Enthusiasm
Pride among users
Publicity in media


Poor access to knowledge
Lack of good examples
Conflict with basic needs (belief)
Skepticism
Poor access to knowledge
Lack of good examples
Skepticism
Strict tender
Lack of experience
Poor access to knowledge
Economy
Traditions (public)
Conflict with basic needs (belief)
Skepticism
Strategic adaption to rental market (private)
Feasibility
Conflict with basic needs
Disturbing noise & dust
Initiating
Defining needs
Tender 1
Planning
Design
Tender 2
Construction
Completion – hand over
Evaluation
Achieve energy label
Energy savings
Image as frontrunner
Financial support
Increase value
Green image (private)
Focus on energy efficiency in media
Experienced actors
Knowledge support
Energy savings
Profitability
Achieve energy label and environmental goals (public)
Competitive advantage in the market
Involvement and decision of top Management
Experienced actors
Knowledge support
Learning opportunities
Image
Enthusiasm
Pride among users
Publicity in media
Experienced actors
Knowledge support
Achieve energy label
Learning opportunities
User involvement
Model project
Enthusiasm and pride among users
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Achieve energy label
Learning opportunities
User involvement
Model project
Freedom to create dream team (trust)

Recommendations to authorities

How to…	increase attractiveness	improve competitiveness	improve affordability	improve availability
Strengthen drivers				
Eliminate barriers				

Recommendations to the construction industry

How to…	increase attractiveness	improve competitiveness	improve affordability	improve availability
Strengthen drivers				
Eliminate barriers				

Thank you for your attention!

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