



Highlights of Sub-Task B and C: Existing building stock and new buildings / communities

Elsabet Nielsen, DTU

Leader of Subtask B of Task 66: Xinyu Zhang, China Academy of Building Research, CABR

Email: zxyhit@163.com

Leader of Subtask C of Task 66: *Elsabet Nielsen*, Technical University of Denmark, DTU

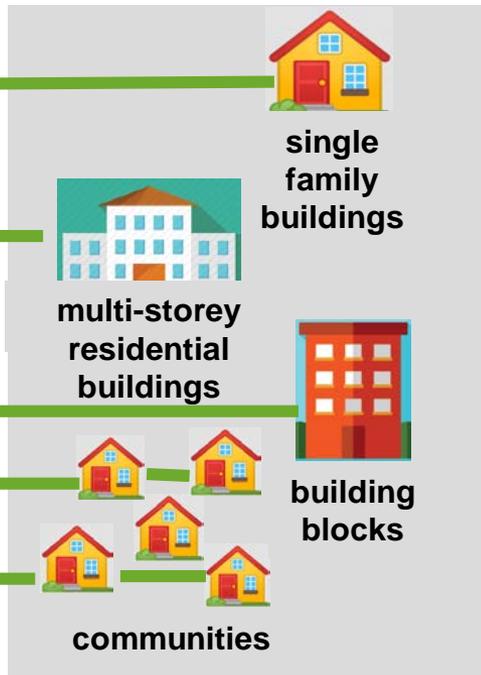
Email: elsa@dtu.dk

Difference between Subtask B and C

Subtask B

Single buildings
new and existing

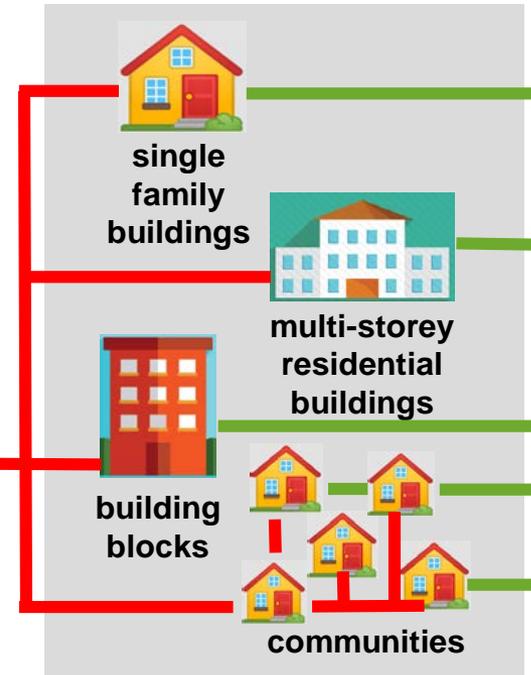
→ not connected to thermal grid



Subtask C

Communities / building blocks
new and existing

→ connected to thermal grid



PV
system



wind
power
system



heat pump



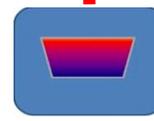
industrial
waste heat



Solar
thermal



biomass



seasonal
heat storage

electrical grid

thermal grid

Activities

Activity 1: Demonstration cases

- Demo cases
- Guidelines for monitoring and reporting
- **Stakeholder viewpoints**
- Key findings
- Best practices

Deliverable 1: Summary of demonstration cases (January 2023)

→ Good solutions for practitioners for inspiration

Activities

Activity 2: Planning and implementation methodology

- Processes and tools for SEB designs
- Tools and methods for different phases:
 - Design, construction
 - Operation and verification
 - Maintenance, renovation
 - End of life

Deliverable 2: Description of processes and tools used to design new SEB / SEB communities (August 2023)

→ Processes, design tools and methods for practitioners on SEB designs

Activities

Activity 3: Modelling, simulation and optimization tools

- Tools for SEB modelling
- Evaluation of the tools
- Calculations and optimizations of SEBs

Deliverable 3: Evaluation of optimization tools for SEBs, and modeling and simulation (January 2024)

→ Calculations and optimizations of different SEB concepts with different technology combinations under different operating and weather conditions

Deliverable 4: SEB catalogue (June 2024)

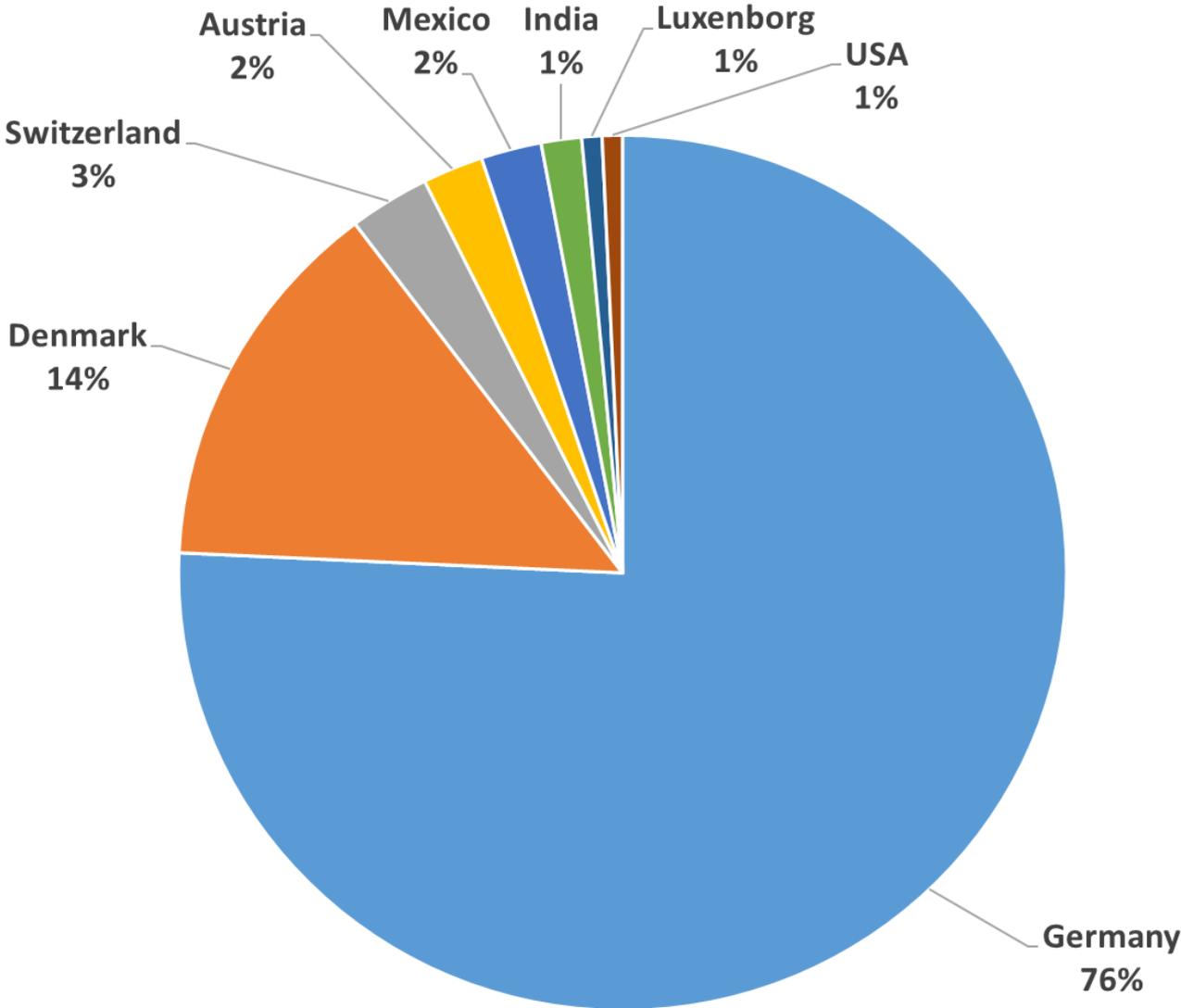
→ Catalogue with optimized SEB solutions

Stakeholder viewpoints

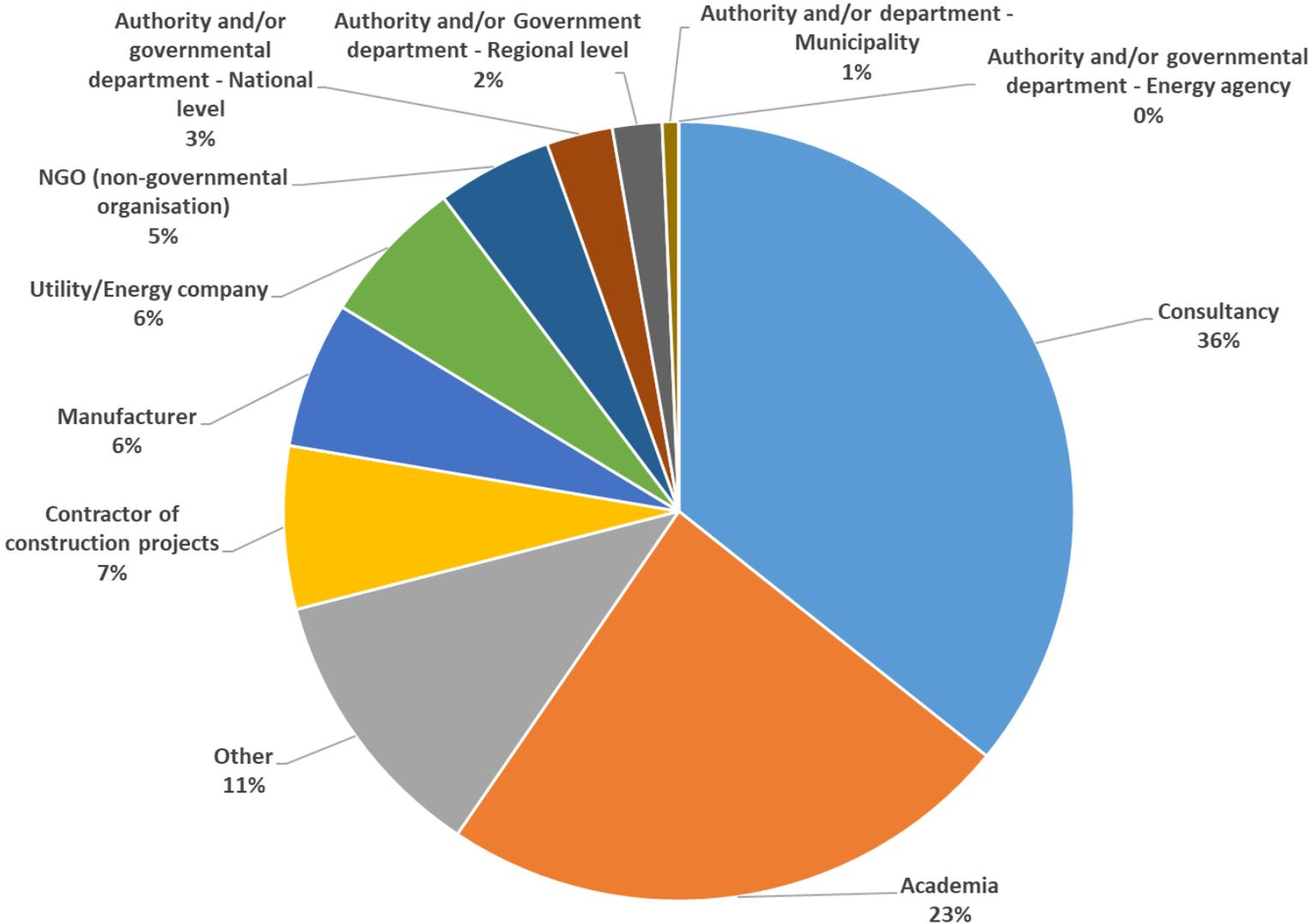
Questionnaire – until now 136 answers

- Planning aspects
- Project development aspects
- Performance aspects
- Financial aspects
- Environmental aspects

Countries represented



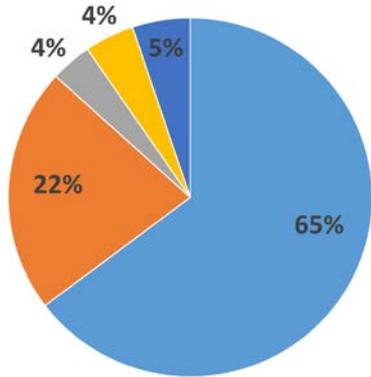
Organization represented



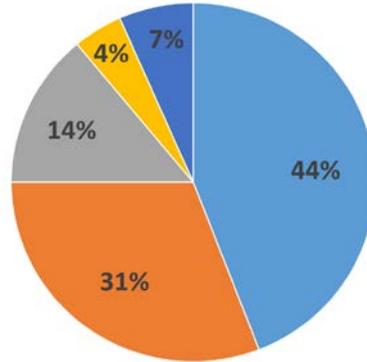
Planning aspects

How important do you find the *need for changes* in the following planning aspects related to Solar Energy Buildings?

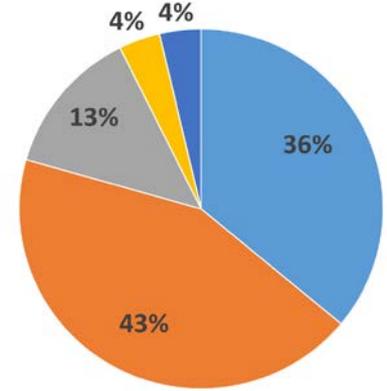
- Very relevant
- Somewhat relevant
- Neutral
- Somewhat irrelevant
- Very irrelevant



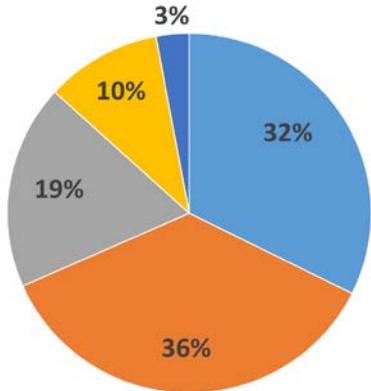
National legislation and regulation related to renewable energy technologies



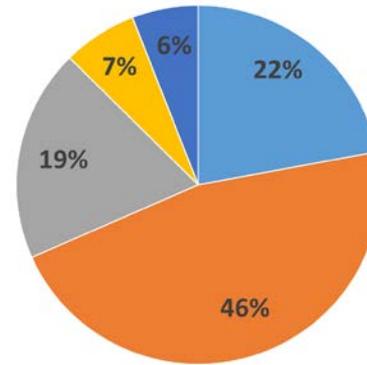
Public awareness/social acceptance



Urban planning and Zoning regulations



Environmental impact assessment

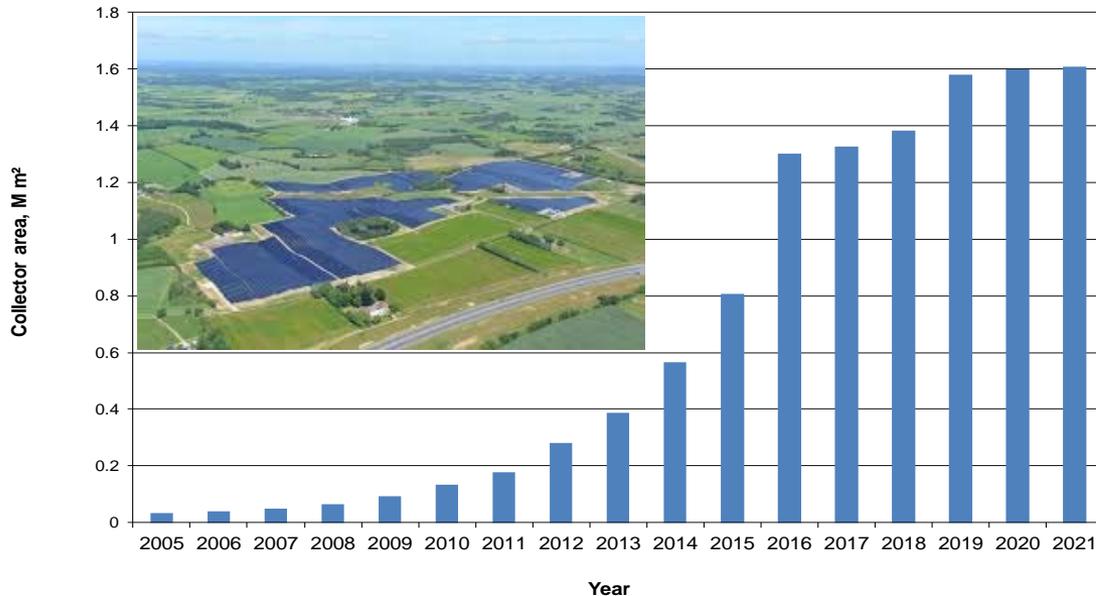


Building and public use permit

Solar heating plants in Denmark

**Solar district heating plants in the World by end of 2021:
299 solar heating plants > 500 m². 125 in Denmark, 42%**

2,350,000 m² in operation. 1,608,401 m² in Denmark, 68%!



Year	Total district heating, PJ/year	Solar district heating, PJ/year	Solar district heating, %
2011	132	0.33	0.3
2012	136	0.55	0.4
2013	135	0.68	0.5
2014	122	0.98	0.8
2015	130	1.26	1.0
2016	135	2.03	1.5
2017	136	1.93	1.4
2018	135	2.47	1.8
2019	131	2.59	2.0
2020	135	2.87	2.1
2021	135	2.58	1.9

**Low heat price for solar heating plants,
about 0.04 euro/kWh**

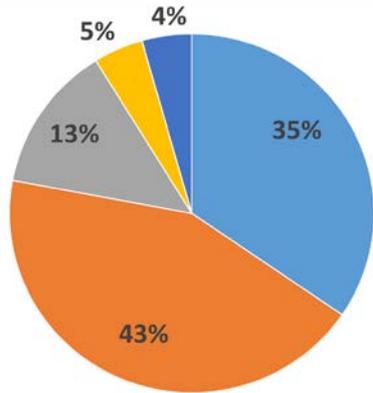
Solar heating plants in Denmark



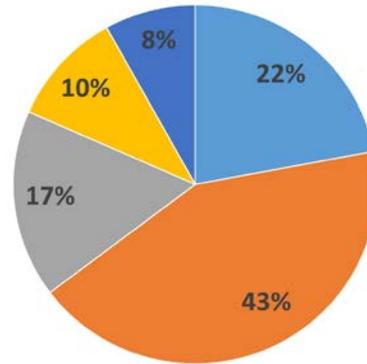
Project development aspects

How *important* do you find the following aspects related to Solar Energy Buildings?

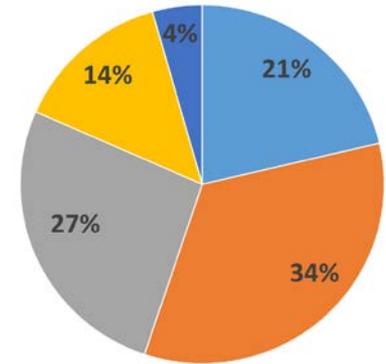
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- Somewhat irrelevant
- Very irrelevant



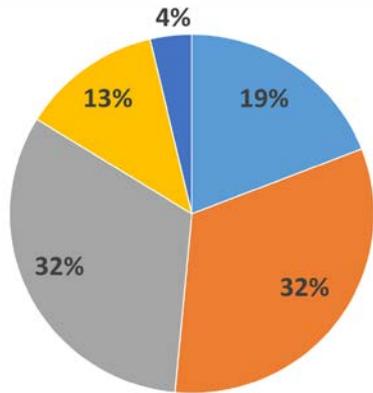
User involvement



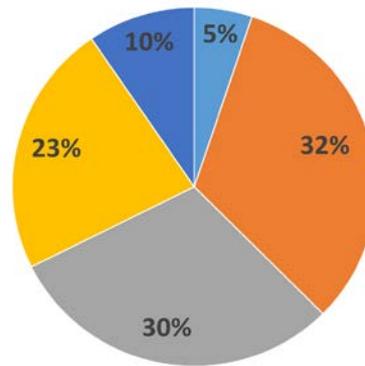
Possibility to follow energy performance of buildings, e.g. via app



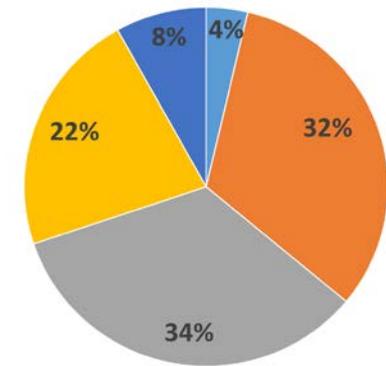
Appearance of the Solar Energy Building - esthetical qualities



Minimal invasive measures during implementation



Building has a Solar Energy label

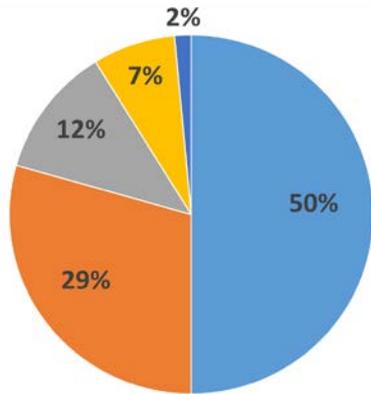


Building transition is visible

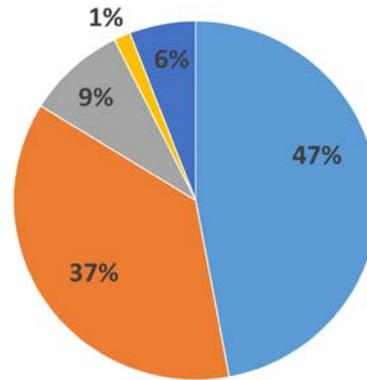
Performance aspects

How *important* do you find the following aspects related to Solar Energy Buildings?

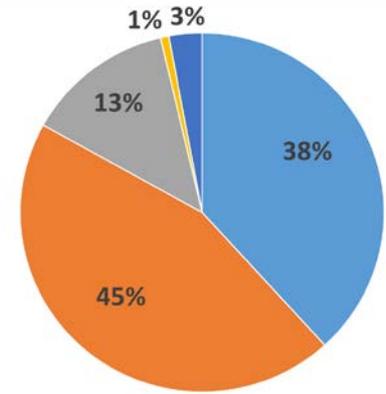
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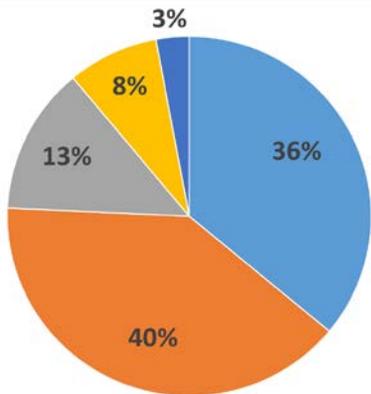
Energy demand reduction in parallel with installation of solar energy systems



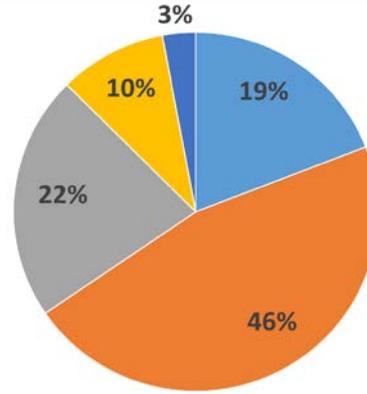
Stable rules on selling energy/electricity (limitations on quantities, selling price, taxation on sale, etc.)



Electricity costs (for pumps, heat pump)



High degree of self-sufficiency

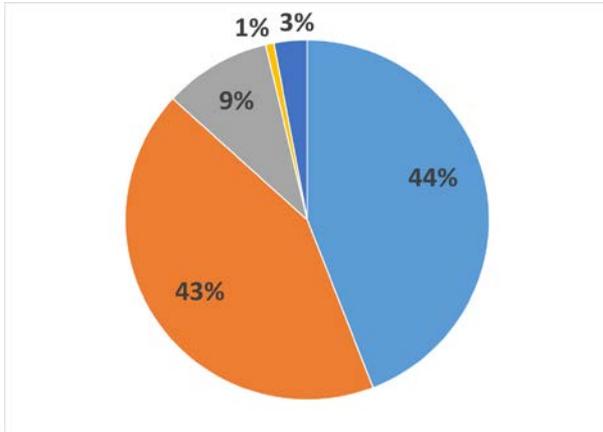


Local/national production of components for the building and the solar energy systems

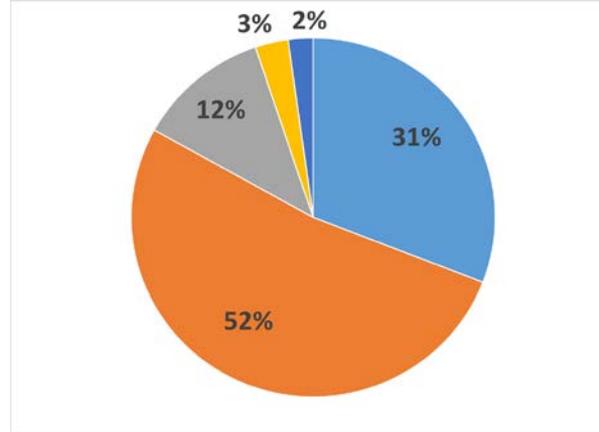
Financial aspects

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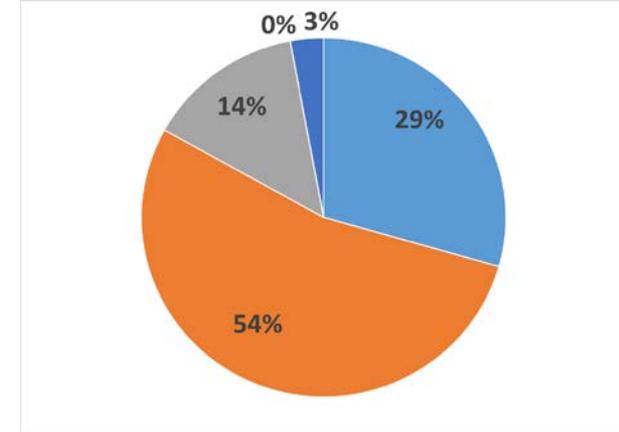
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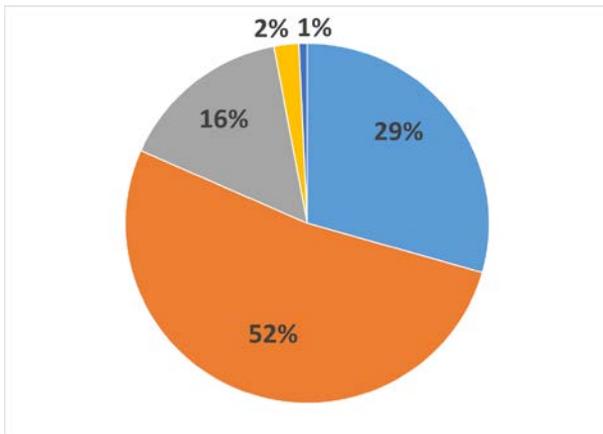
Lifecycle costs (Total Cost of Ownership over the lifetime, TCO)



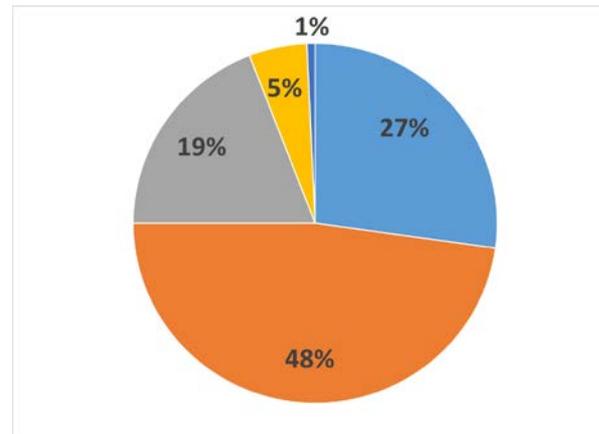
Operational costs (Operational Expenditure, OPEX)



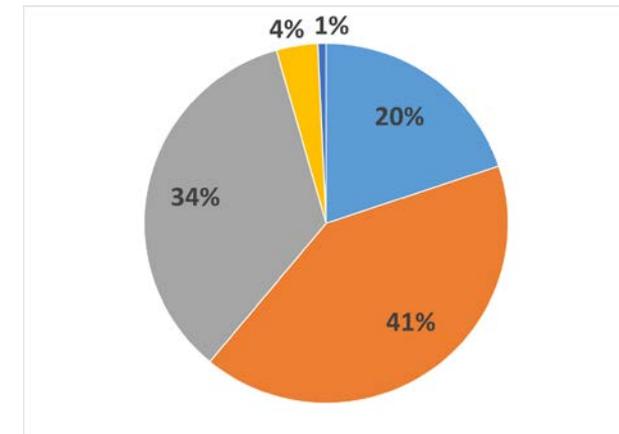
Initial costs (Capital Expenditure, CAPEX)



Performance guarantee



Good financing methods

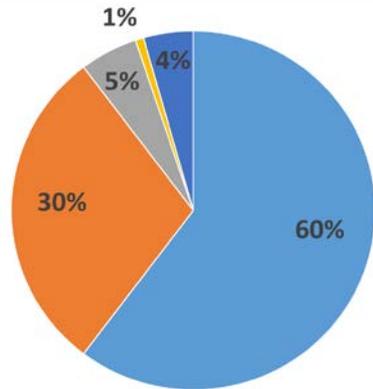


Subsidies

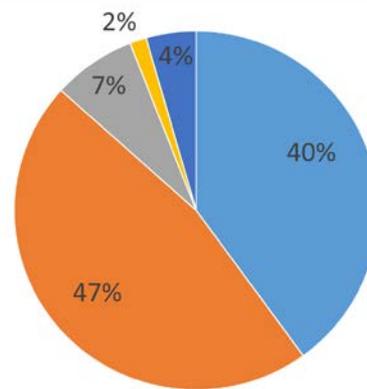
Environmental aspects

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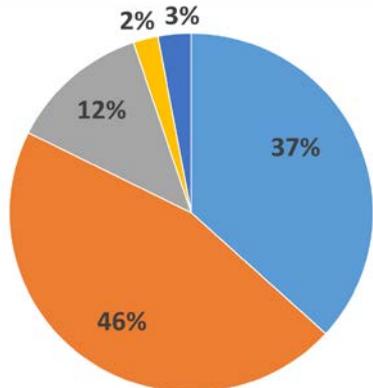
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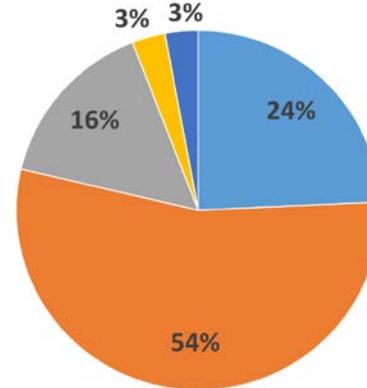
CO2 emission reduction with respect to operation of the solar energy building



Use of recyclable materials



CO2 emission reduction considering the embodied energy of the solar energy building



Use of ecological materials

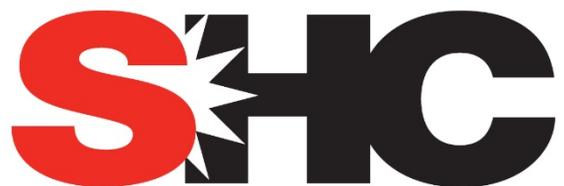
Questionnaire

Most important points

- Planning aspects
 - Need for changed national legislation and regulation related to renewable energy technologies
- Project development aspects
 - User involvement
- Performance aspects
 - Energy demand reduction in parallel with installation of solar energy systems
- Financial aspects
 - Lifecycle costs (Total Cost of Ownership over the lifetime, TCO)
- Environmental aspects
 - CO2 emission reduction with respect to operation of the solar energy building

Thanks for listening!

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