



ENERGY RENOVATION OF LANGKÆRPARKEN

esbensen

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Company presentation

- Besides the traditional engineering disciplines. Is Esbensnes key competence and methodology integrated energy design.
- We have the competence and willingness to engage in dialogue at the earliest stages of a project and contribute to our creative sparring partners, so the objectives of an energy-efficient construction is achieved by simple and integrated solutions.

The potential for public housing in Denmark

- 40 % of the total energy consumption in Denmark constitutes from buildings
- 20 % of the total housing is public housing (a total of 500.000 apartments)
- As you see there is a opportunity for saving energy due to the big heat lorse.



History of Langkærparken

- Buildt in 1969-1971
- 35 blocks
- 860 appartments in 3 storages
- Renovated in 1990
- No empty appartments
- AL2Bolig
- Energy renovation is part of a masterplan



About the selected block

Division	E1	E2	E3
1 room (30 m ²)	3	1	
3 room (92 m ²)	3	1	
4 room (108 m ²)	3	3	3
5 room (122 m ²)		2	3
Sum:	9	7	6
Total sum:	22 apartments		
Total sum:	2070 m²		

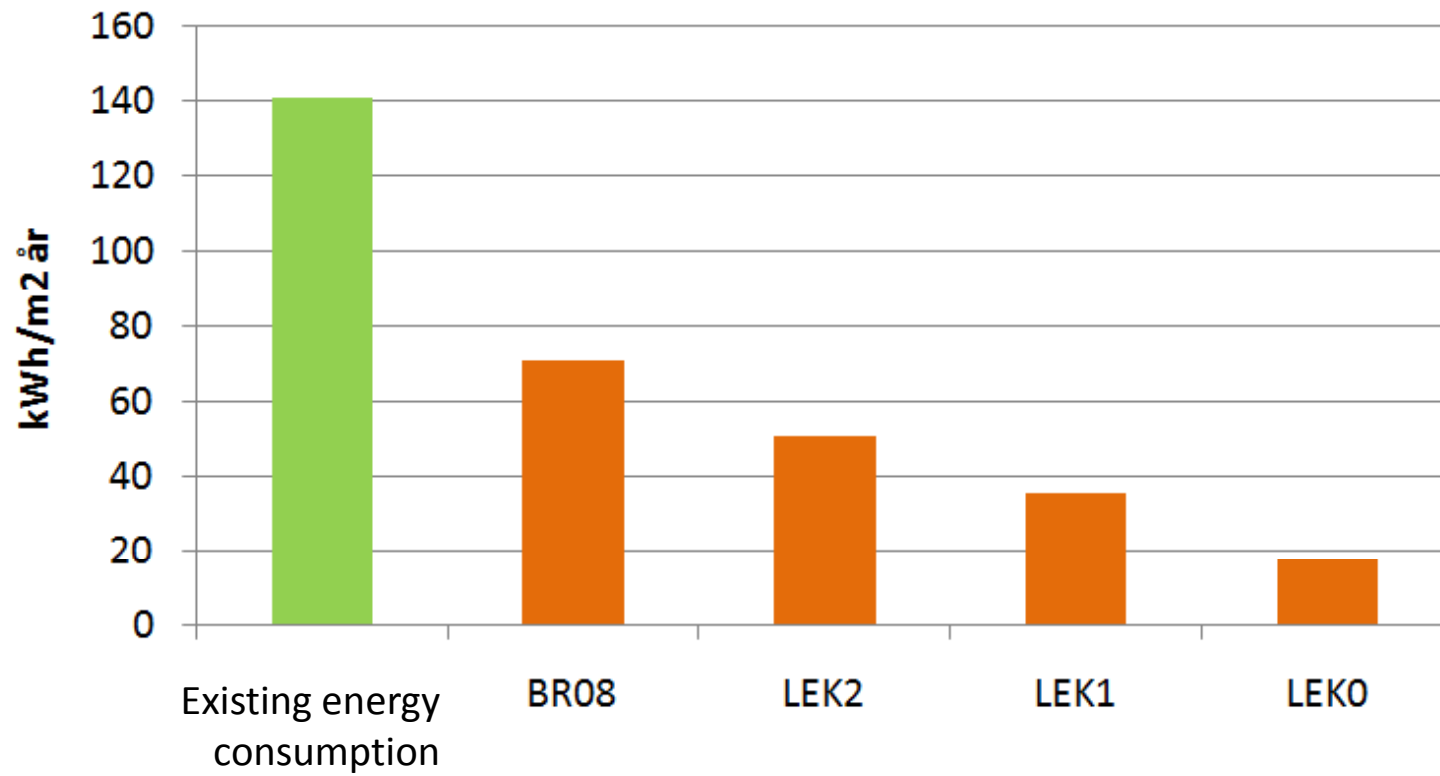


Overall plan for the energy renovation project

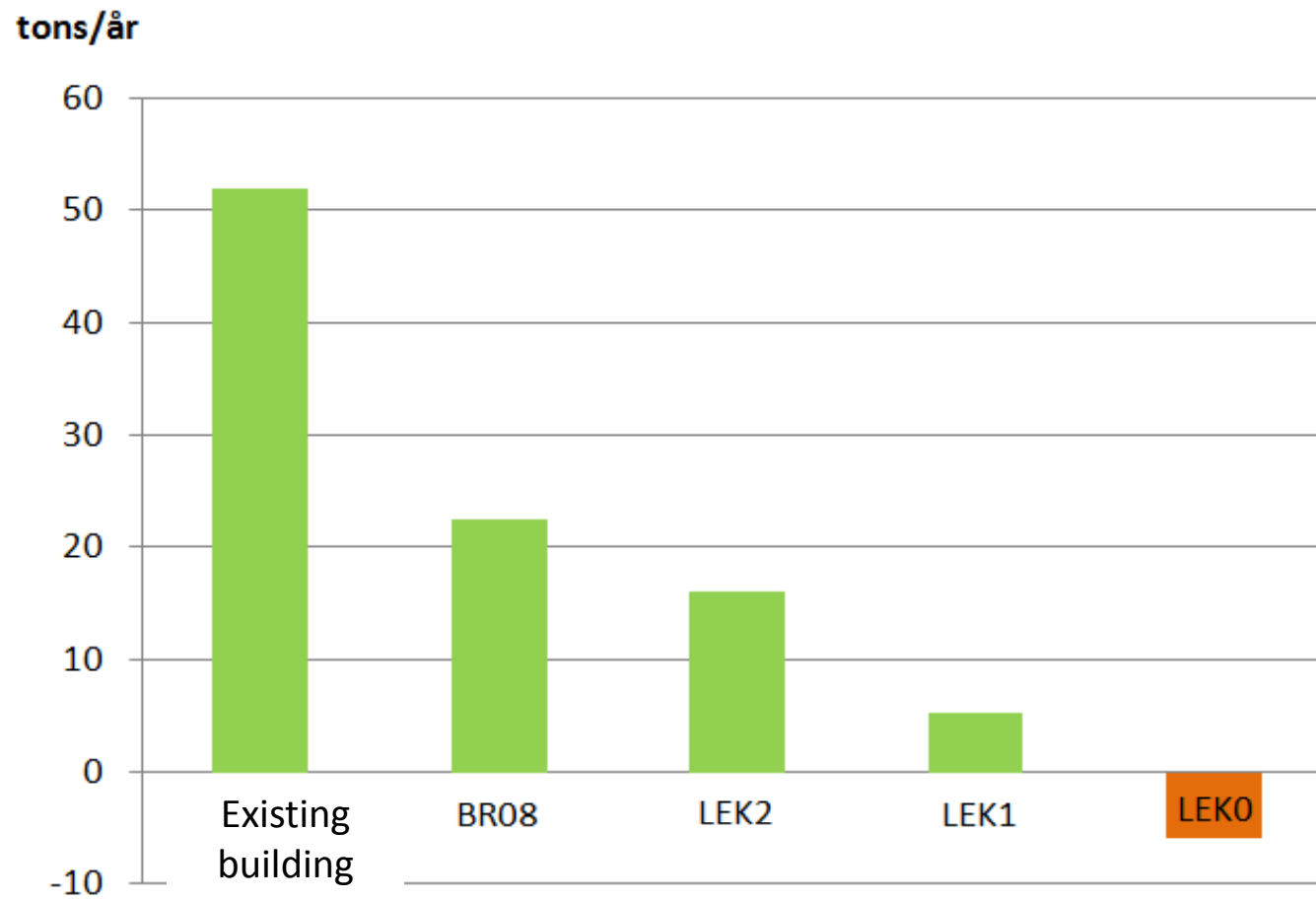
- a. 4 projekts according to 4 energy classes
- b. All 4 cases are priced by a main contractor.
- c. AL2 Bolig will select 1 of the 4 projekts will be selected the ambition is LEK 0.
- d. After renovation. There will be measurements on both the selected project and the reference building.
- e. Evaluation, reports is a part of the projekt.



Energy classes



Corresponding CO2 emissions



Time plan for the climate project

Activites/ quarter	1/09	2/09	3/09	4/09	1/10	2/10	3/10	4/10	1/11	2/11
Phase	Phase 1				Phase 2					
Prequalification. Workshop 1										
Workshop 2 + 3										
Workshop 4. Conceptual.										
Project proposal. Retail project. Supply. Workshop 5. Decision of which case to continue with.										
Execution										
Evaluation. Workshop 6										
Workshop 7. Dissemination.										

AL2Boligs proposal to the tenants.

- Same expenses as before as:
 - Smaller bill of energy consumption
 - Larger bill of rent
- We help you moving out and back again, and we will pay for it!
- If you don't want to stay in the new apartment it is possible
- You can choose the indoor designs – either one of the new proposals or just the old one

Working methodology of the project

- Integrated process:
 - Organisation supplied by external advisors
 - Integrated energy design
 - Workshops
 - Tenants and AL2Bolig has focused alot on the communication:
 - Making special newspapers about the climate project
 - Information meetings
 - Knocking doors

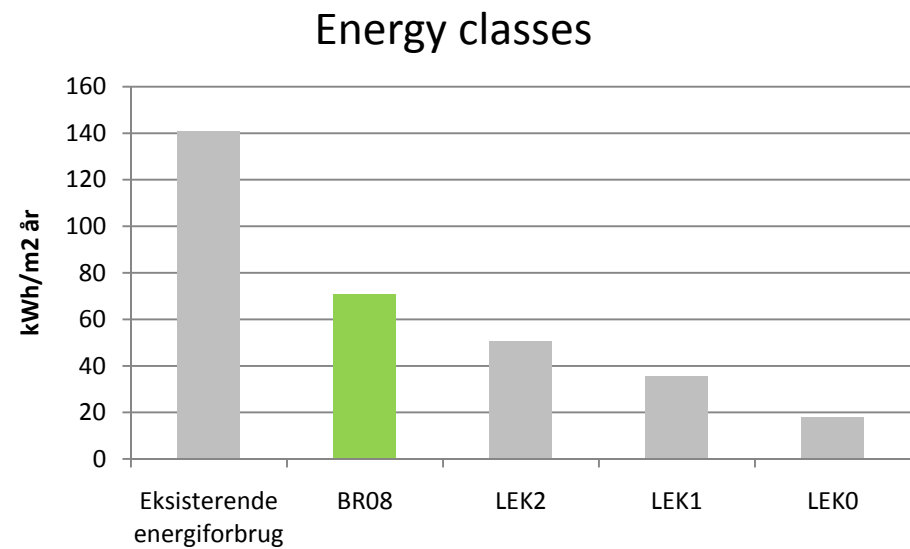
General conditions for all 4 cases

- “Coating principal”
- Optimizing the climate screen in all cases:
 - Insulation thicknesses
 - Elimination of cold bridges
 - Focus on airtightness



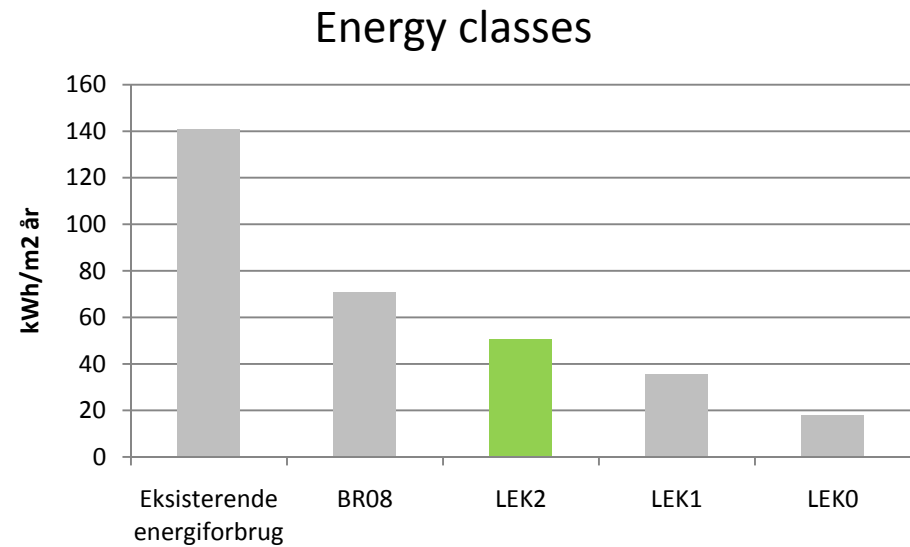
Case 1 – Standard (BR08)

- Appr. 70 kWh/m² year
- Extra insulation in walls, ceiling and floor
- Opgrading all windows.
- New mechanical ventilation aggregate with heat recovery.



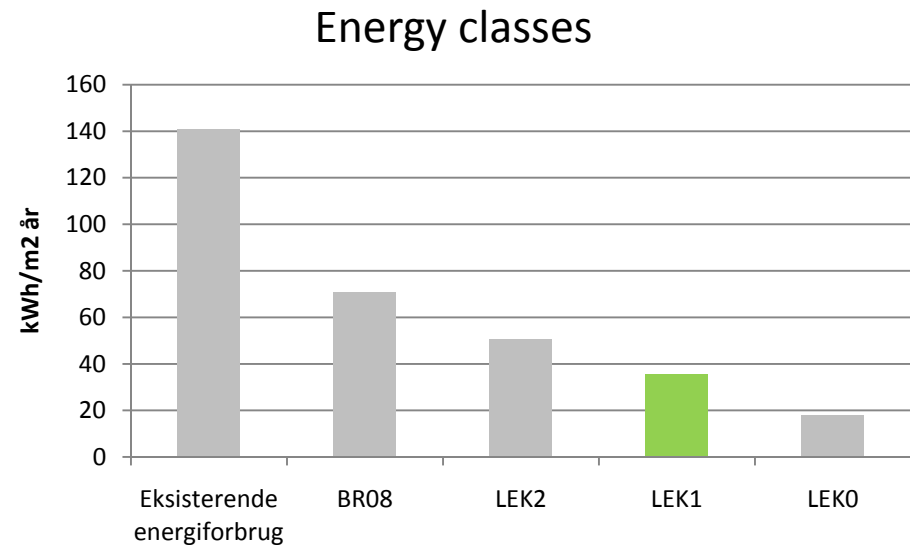
Case 2 – Low energy class 2

- Appr. 50 kWh/m² year
- As Standard 08 only more of everything.
- Implementation of solar heating (appr. 1 m² pr. apartment)
- Disconnection of district heating will be investigated



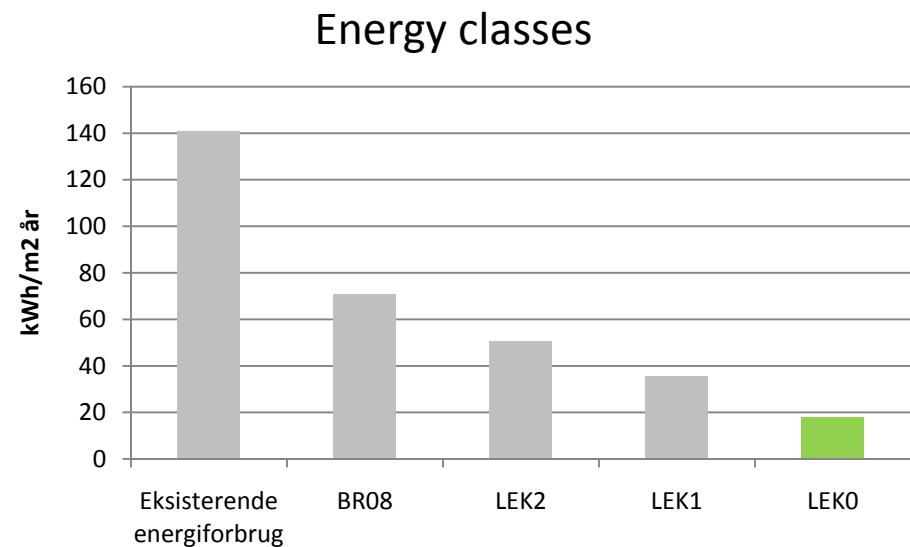
Case 3 – Low energy class 1

- Appr. 30 kWh/m² year
- As LEK 2 only more of everything.
- Implementation of solar heating (appr. 3 m² pr. apartment)
- Implementation of solar cells (appr. 4 m² pr. apartment)
- Disconnection of district heating will be investigated

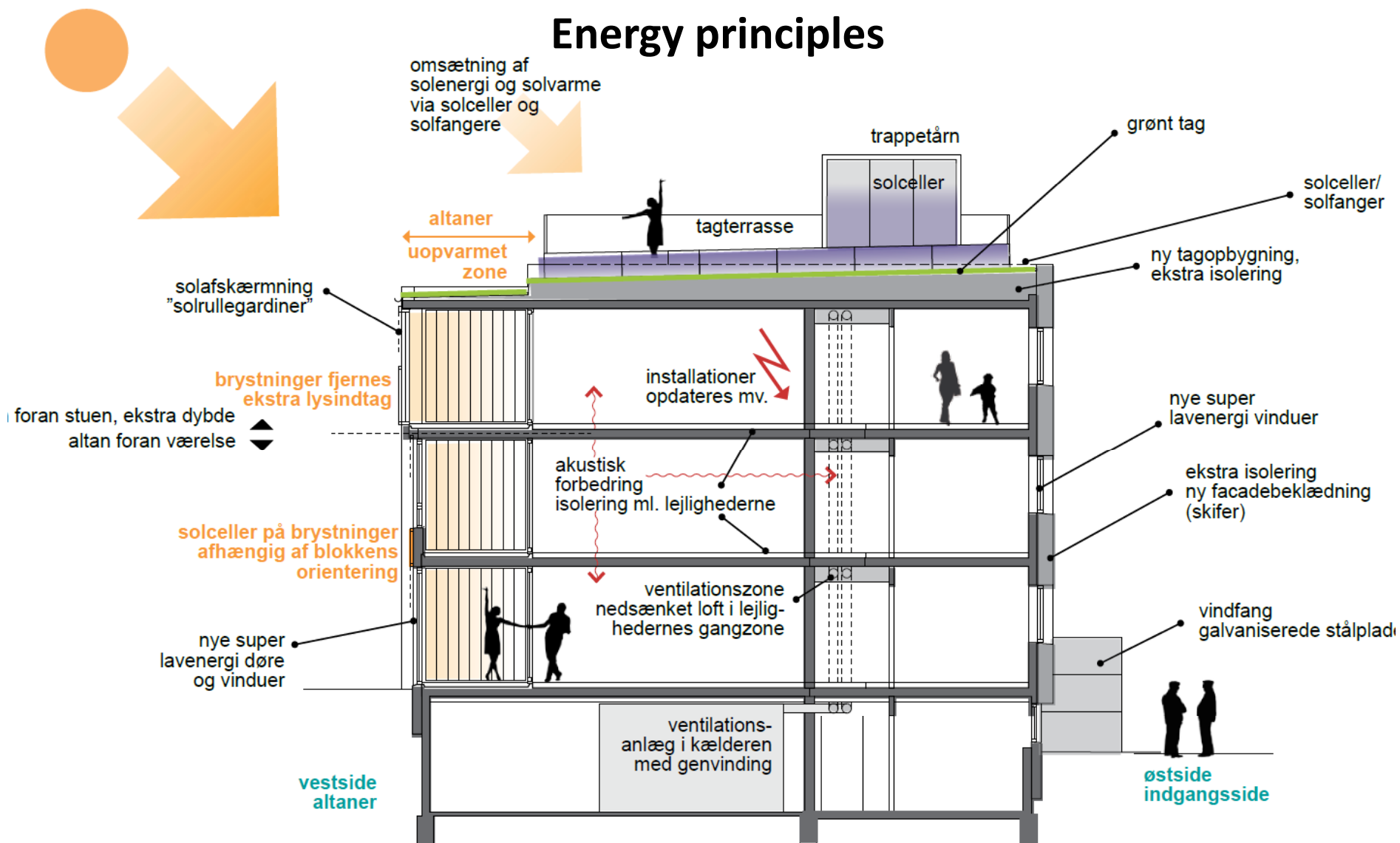


Case 4 – Low energy class “0”

- Appr. 18 kWh/m² year.
- As LEK 1 only more of everything.
- Implementation of solar heating (appr. 3 m² pr. apartment)
- Implementation of solar cells (appr. 12 m² pr. apartment)
- Disconnection of district heating will be investigated



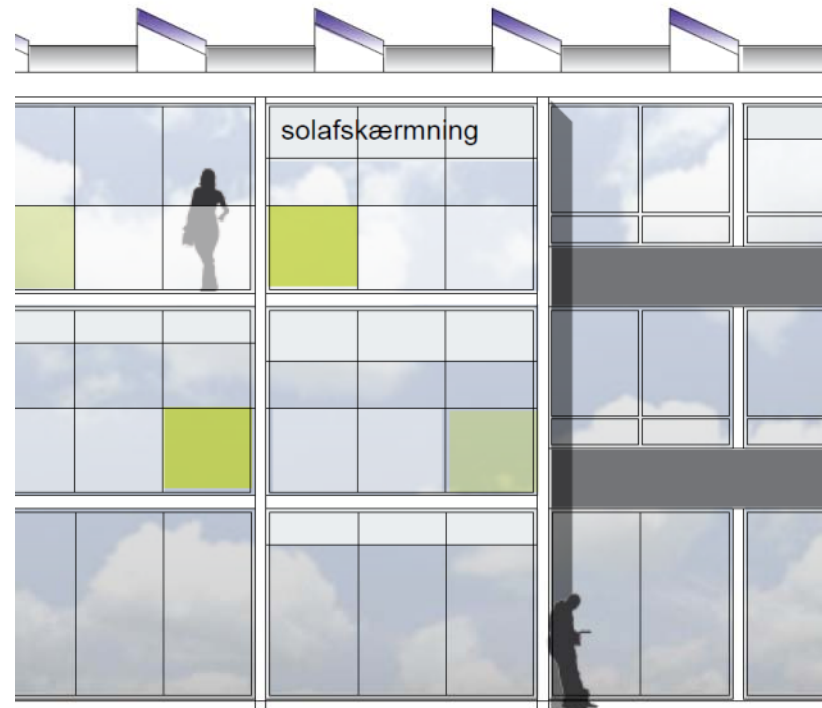
Energy principles



New facades

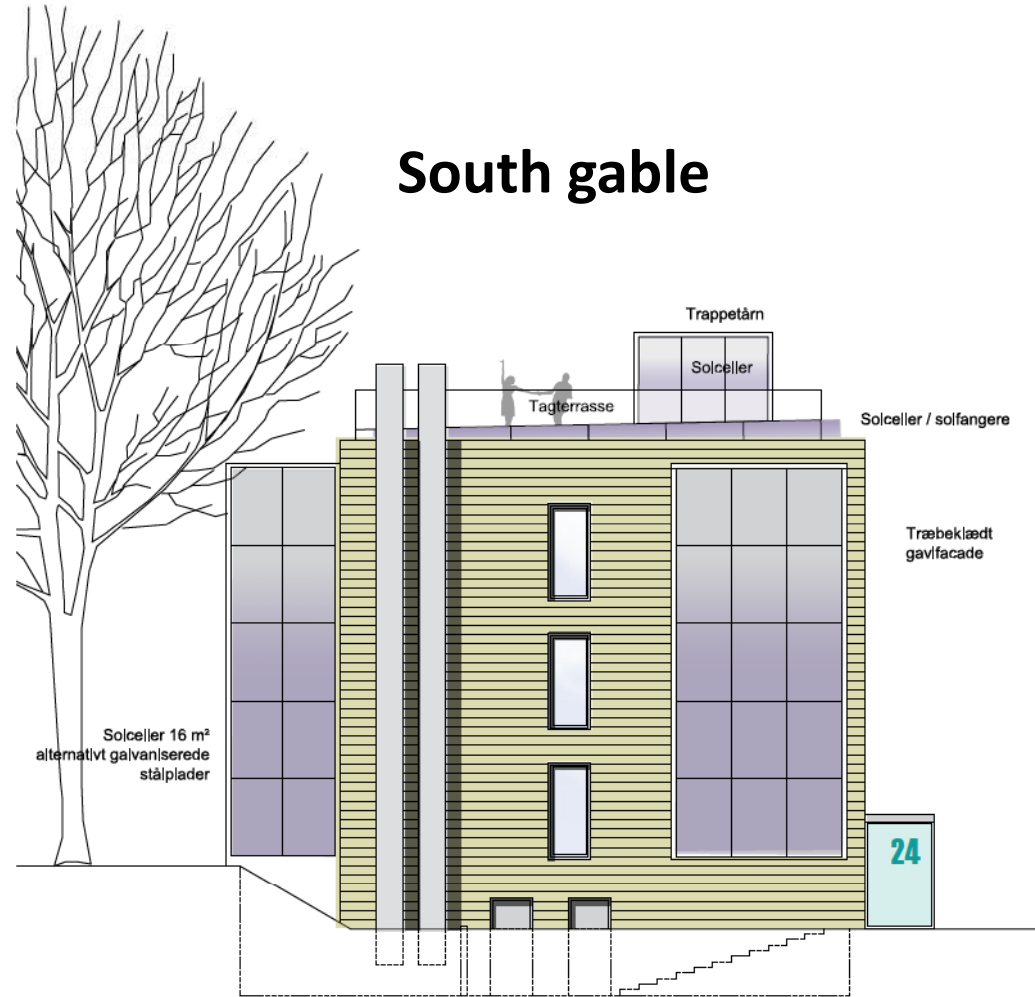
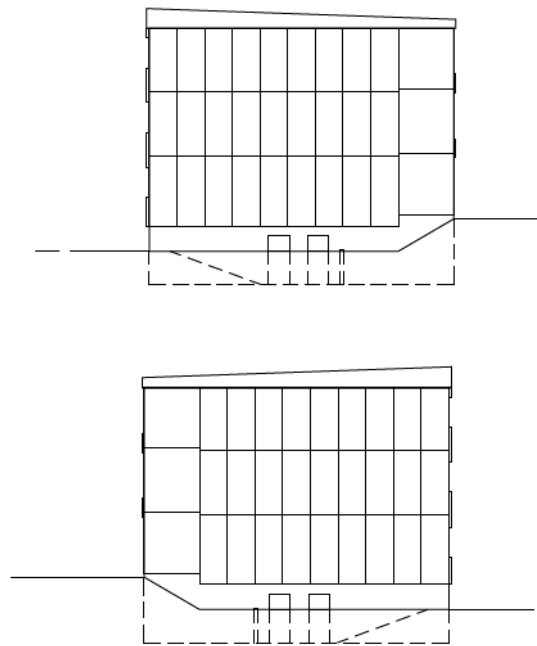


Facade towards East



Facade towards West

South gable



Primary energy source – district heating

- Langkærparken is within an area of district heating of Affald Varme Århus (AVÅ)
- According to BR08 only new buildings can be disconnected to the district heating grid when fulfilling Low Energy Class 2 or 1
- It is a challenge for energy renovation projects if they are placed in an area with district heating as the cost of district heating is divided into 2 parts:
 - Variable costs (proportional to the energy consumption)
 - Non-variable costs (fixed cost is to cover all expenses according to maintenance of the grid)

Primary energy source – district heating

- AVÅ have future plans with low temperature district heating
- AVÅ has shown interest in the climate project and are open to a dialouge in order to find a suitable price system
- Three principals have been discussed:
 1. District heating with $T = (60/40)^{\circ} \text{C}$ and reduced costs
 2. Connection to the return pipes with $T = (30-35)^{\circ} \text{C}$ and reduced costs
 3. Complete disconnection from district heating

Conclusions

- To have a succesful renovation in almene boliger, it is utterly important that
 - The residents gains something more than just energy reductions (for example better interior designs)
 - Communication has a high priority in order to have success with the voting
 - Energy solutions proposed also are valid in the future



Contact information

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More information about the project

<http://www.al2bolig.dk>