



## Sems Have, Roskilde, Denmark

### Project summary

#### Energy concept:

#### Background for the renovation – reasons

Renovation and transformation of a dormitory/day-care center into 30 low energy apartments:

- Improved thermal envelope – walls, roof, windows
- Balanced mechanical ventilation with heat recovery
- Improved architecture
- Danish Building class 2020
- PV



The two blocks of Sems Have before the renovation (to the left) and after the renovation (to the right).

<b>Site:</b>	<b>Parkvej 3-5, 4000 Roskilde</b>
Altitude	47 Meter
Heating degree days:	2906
Cooling degree days:	0
<b>Owner:</b>	<b>Boligselskab Sjælland</b>
<b>Architect:</b>	Kullegaard Arkitekter
<b>Engineer:</b>	Terkel Pedersen

#### Building description /typology

- 2 blocks
- 1973
- General information: Energy label C
- Gross heated floor area: 3,388 m<sup>2</sup> after renovation

**Contact person:** Flemming Østergaard,  
Boligselskab Sjælland

#### Important dates:

Renovation start: Nov, 2012

Renovation completed: Dec, 2013

#### Date template completed:

March 14, 2013

## The buildings before renovation



*The façade of block A before renovation. The ground floor contained a day-care centre while the first to third floor was a dormitory.*

*Due to the need for savings Roskilde Municipality decided to stop renting Ungdommens hus and moved the children to a close by day-care centre owned by the municipality.*

*As the buildings was worn Boligselskab Sjælland decided to renovate the buildings and at the same time transform them into apartment blocks with 30 apartments. The name was at the same time changed to Sems Have.*



*The gable of block B before renovation. Block B contained a day-care centre and culture centre.*



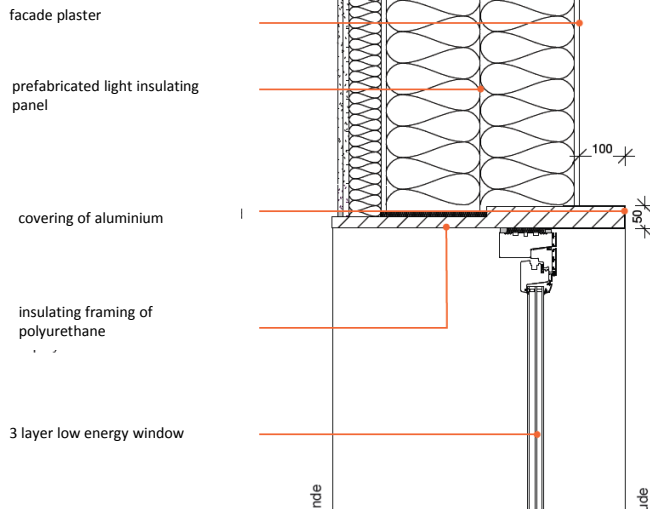
## The buildings after renovation



## Renovation features

Walls:	<i>U</i> -value: 0,2 W/m <sup>2</sup> K
Roof:	<i>U</i> -value: 0,09 W/m <sup>2</sup> K
Windows:	Three-layer low energy windows. <i>U</i> -value: 1 W/m <sup>2</sup> K
Ventilation:	Balanced mechanical ventilation with a SFP factor of 2 J/m <sup>3</sup> Efficiency of the heat recovery unit: 0.84
PV:	117 m <sup>2</sup> 17.3 kW <sub>p</sub>

Horizontal section of the window frame and wall, block A



## Energy demand

Energy demands/production as calculated with the Danish calculation tool Be10:

Net mean space heating demand :	9.4 kWh/m <sup>2</sup> <sub>gross area</sub> *
Net mean domestic hot water demand:	3.7 kWh/m <sup>2</sup> <sub>gross area</sub>
Electricity production from PV panels:	3.6 kWh/m <sup>2</sup> <sub>gross area</sub>
Primary energy demand minus PV production:	16.2 kWh/m <sup>2</sup> <sub>gross area</sub>
Danish building-class (nearly-zero energy) is	20 kWh/m <sup>2</sup> <sub>gross area</sub>

\* not including heat loss to the basement

A similar not renovated residential building would have a net space heating demand of around 150 kWh/m<sup>2</sup><sub>gross area</sub>.

## Economy

The economy of the renovation/transformation is not yet available, however the overall price of the renovation/transformation is estimated to be:

$$15,000 \text{ DKK} / \text{m}^2_{\text{gross area}} \approx 2,000 \text{ €} / \text{m}^2_{\text{gross area}}$$