Context and objectives

- **Typical Swedish social housing from the 70's**
- **Poor maintenance - large potential for improved thermal performance**
- **Objectives:**
  - Combine new and traditional energy related renovation measures
  - Reduce heat demand by 30%
  - Reduce electricity end use by 30%
  - Keep rent at the same level, i.e. annual energy savings should equal annual capital cost for applied energy measures

Improvement compared to standard renovation

- **Heat recovery on ventilation (stand/new)**
- **Solar preheated hot water (new)**
- **Improved building envelope (stand.+new)**
  - New roof covers with additional insulation (stand.)
  - New gable facades with additional insulation (stand.)
  - Glazed balconies / Balcony renovation (new)
  - Improved windows / New inner pane with low-e coating (new)
- **PC-based system supervision (stand/new)**
- **Individual metering (new)**

Building before and after renovation

Construction 1970:
Concrete element blocks;
Supply & Exhaust vent.;
Heat demand: 270 kWh/m^2/a
(3 800 degree days base 18)

Photos : Gårdstensbostäder

Renovation 2000:
Heat demand red. by >40%,
Electricity reduced by 30%
Energy measures: 8 400 €
per unit; Energy savings:
600 € per unit and year,
i.e. 14 years simple pay-back