Sustainable building design in practice
- M.Sc. Environmental Engineering HVAC Tallinn
- Exchange student Barcelona
- Master's Thesis
  Thermal Energy Storage
  Göteborg
Facts at a glance

Sales ~11,000 SEK million
Number of employees: 9,000
Number of ÅF offices: 100
Geographical coverage:
  Established in more than 30 countries, assignments are carried out in over 100 countries

Making Future.
Ecological
Sustainability
Economic
Social
Why ?
ENERGY REQUIREMENTS COMMERCIAL BUILDINGS
Building’s energy use in Gothenburg

100
65
42

60%

kWh/m², år

Beställarkrav
Miljöbyggnad 3.0

BBR 2008
BBR 19 2011
BBR 22 2015
BBR 25 2017
NNE 2021

65
39
25

9
In practice?
- New Office Building 11 000 m²
- Under construction until 2019
- Akademiska Hus
- Innovation arena for cooperation between academy, trade and industry
- Innovation partners – ÅF
- Partnering

Johanneberg Science Park 2
LCA – Framework material

EMISSIONS GREEN HOUSE GAS

-35%

Wood framework

Concrete framework
Architect
Natural ventilation in atrium
Natural ventilation in atrium
**Solar shading solutions**

- **Atrium g-system <0,12**
  - MicroShade

- **Office floors g-system <0,1**
  - External automatic zip-screen
  - Floors 2-6 East, South, West

- **Ground floor g-system <0,12**
  - Electrochroma glas
Dagsljusfaktor plan 2
öppen planlösning

106 Öppna arbetsplatser
1 Entrézon
5 Mötesrum
12 Tystarum/samtalsrum
6 Öppna mötesytor
Design process

[Image of design process notes and diagrams]
- VAV, dimensioned with climate simulations
- Natural ventilation in atrium
- Lighting with low installed power
- Lighting with daylight control
- Solar cells on the roof with batteries
- DC
- District heating from local plant at campus area
- District cooling from local plant at campus area
- PCM energy storage for reducing cooling power
- Framework of wood to reduce CO2
- Shuco curtain wall façade
- MicroShade in atrium façade
- Zip-screens on office floors
- Electrochroma windows*
- Window design for daylight
- Reduced window area for less heat transmission
- High energy performance requirements
- High ambitions for sustainability
- Miljöbyggnad Guld
Environmental labelling systems
Miljöbyggnad
Miljöbyggnad

• **BRONCE** – BBR = legislation
• **SILVER** – better than legislation
• **GOLD** – requires more effort, questionnaire to the tenants on indoor climate
Miljöbyggnad

- Divided into three areas:
  - Energy
  - Indoor climate
  - Building materials
How ?
Energy and Environmental Coordination
Energy and Environmental Coordination

PM Property Owner

Energy
- Architect
- HVAC
- Electrical

Environ.
- Structural
- Contractor
Thank you!

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