Integrated control of Light, Solar Shading and HVAC in *Low Energy* Buildings

Anders Hall

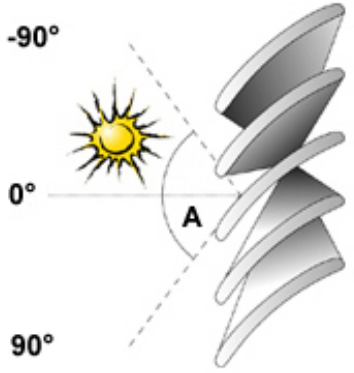
Business Development Mgr Projects

Somfy Nordic

Secretary of the Board and

Chairman of the Marketing Committee

European Solar Shading Organisation, ES-SO



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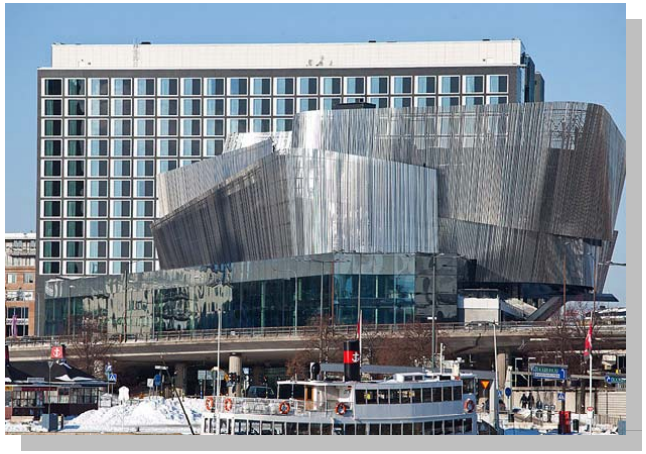
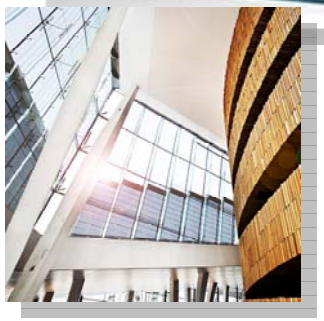
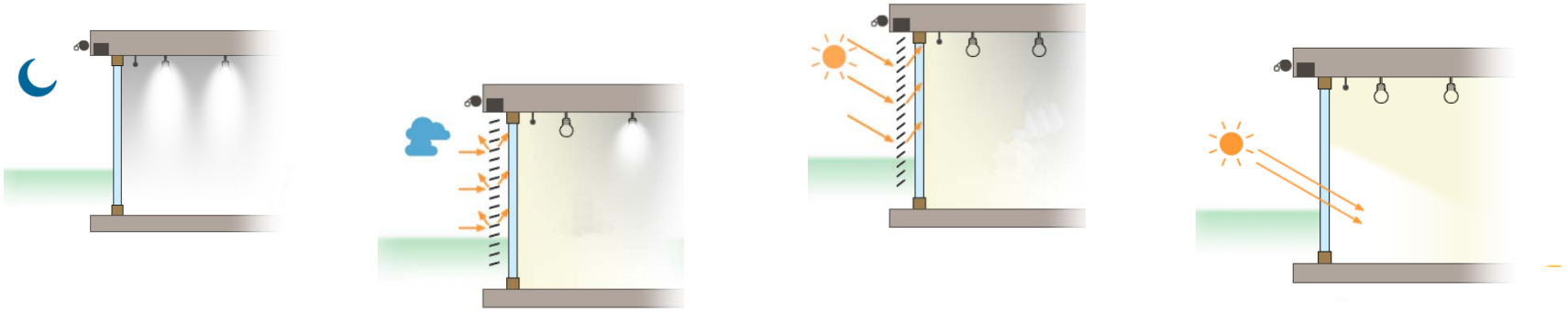
Buildings



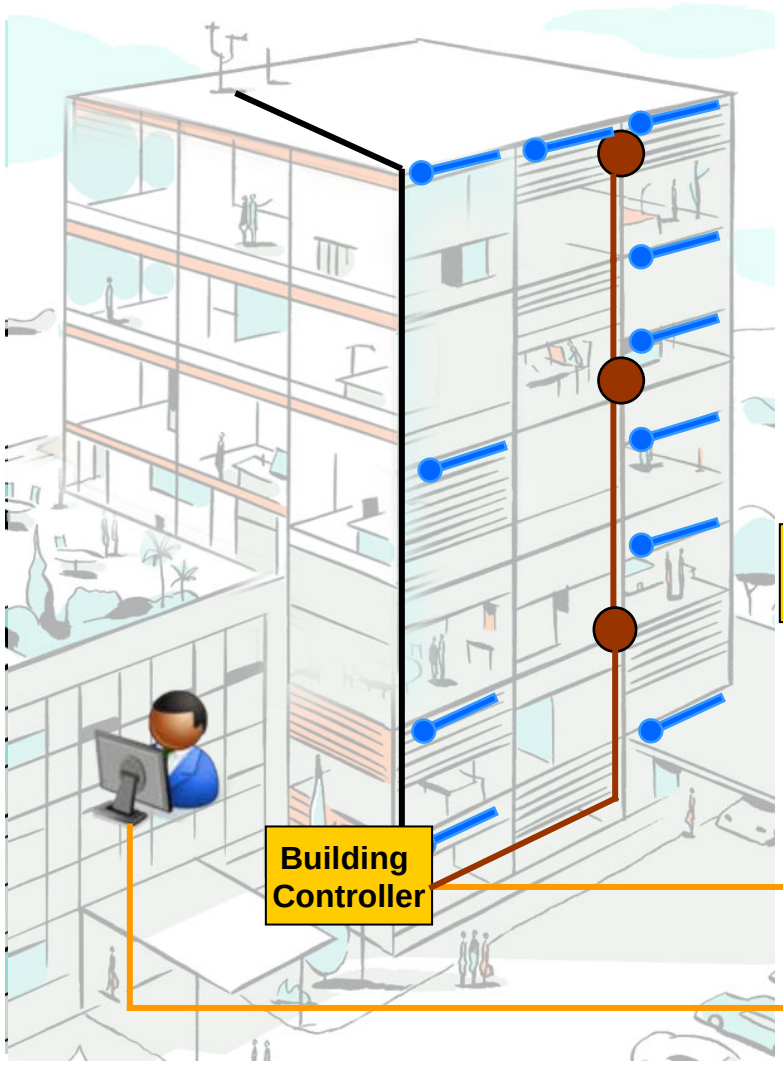


Intergration of control

- A lot of functions need to be integrated
- But controlled separately
- Experience prooves
- Master – Slave solutions in correct priority
- From the outside in and based on precence and own sensors
  - Solar Shading according to present weather/light condition
  - Light to compensate when Solar Shading is active
  - Ventilation to support when temp is high or low



Integration of control

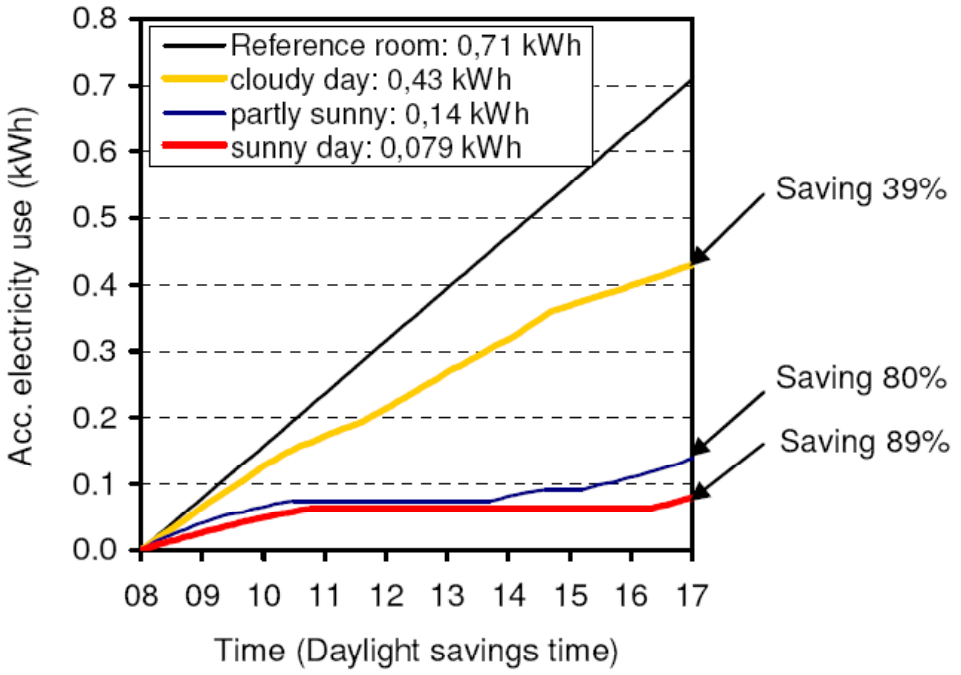


Facility Manager
Somfy Support
Installer

IP connection

Intergration of function

Lund University, Sweden 2007



On a yearly basis ~ 35% savings

Best practises in Sweden

Let us look at two good examples and how they solved it by using this technical approach

Project Krokslätt, Gothenburg, Sweden

This project is one of the most energy efficient office buildings in Sweden.

240 Windsecure External Blinds + Somfy animeo IB+ (stand alone) control system

An extensive follow-up on the comparison between planned consumption and actual.

Max allowed electrical BUILDING consumption for new buildings 2010 was 100 kWh/sqm.

BENGT DAHLGREN

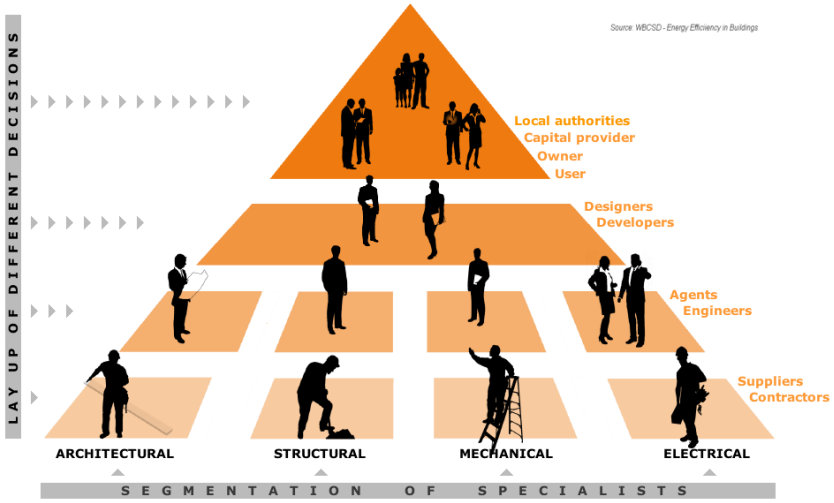
Target

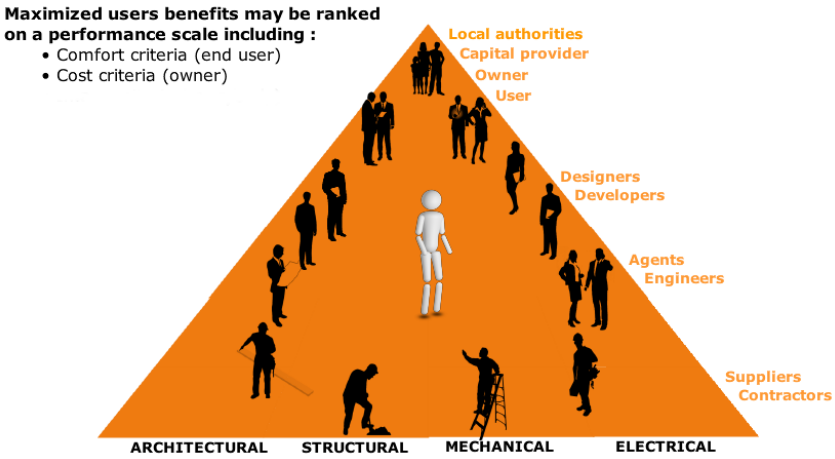
- **GREEN BUILDING**
- **75 kWh/m2 och år**

- **CLASS ”GOLD”**

Planning

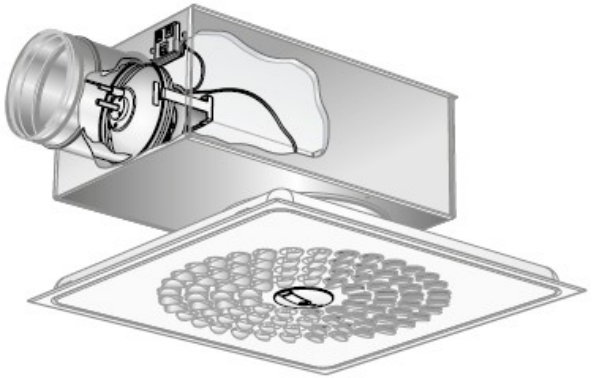
- Planning based on values like
  - Holistic approach
  - True engagement by all parties
  - New ideas
  - Competence





Ventilation

- Air distribution is controlled 100% via local need at any given point
- Air vents equipped with precence and temp sensors
- Continously managed flow levels
- Cooling via air distribution
- Room temp allowed to vary in a wider range than normal
  - Not against a fixed temp

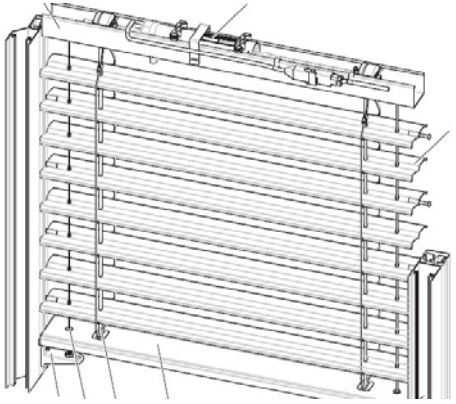


Light

- Light system controlled by local needs at any given time
- Lightfixtures equipped with precence detectors and Lux meters
- Precence detectors control 50% of all wall sockets
- Ammount of artificial light managed according to natural daylight

Solar Shadings

- Outside external Venetian Blinds
- Suntracking control during the year
- DOWN during night at minus degrees (adding U value)
- UP if the building is empty and cold outside



Results per year

Heat / Hot water	26 kWh/m2
Regained heat	(-)9 kWh/m2
Cooling	11 kWh/m2 och år
Pumps, Fans etc	24 kWh/m2 och år
Total energy consumption	**52 kWh/m2 och år**
Daily running consumption	30 kWh/m2 och år
Total energy use	**82 kWh/m2 och år**

Project DOCKUMS, Malmö, Sweden

- 200 Outside Blinds
- Integrated behind the Brick Wall
- Suntracking
- Local control during daytime
- Somfy controlsystem with remote access

Key functions

Ventilation system	VAV-system Rotating heat exchanger Precence detection controlling temperature and airflow CO^2 detection as complement Each working place gets a unique climate

The airflow is used to distribute the cooling!

Results

Building regulation 2011	max **90 kWh/m²**
Actual	**54,88 kWh/m²**;
• Heating	28,19 kWh/m²
• Consumption	18,69 kWh/m²
• Hot water	1,00 kWh/m²
• Cooling	7,00 kWh/m²

27% under demands for GreenBuilding

Conclusion from both projects

In both Buildings it has been recognized that the automated Solar Shading system has given significant contributions to the positive results!

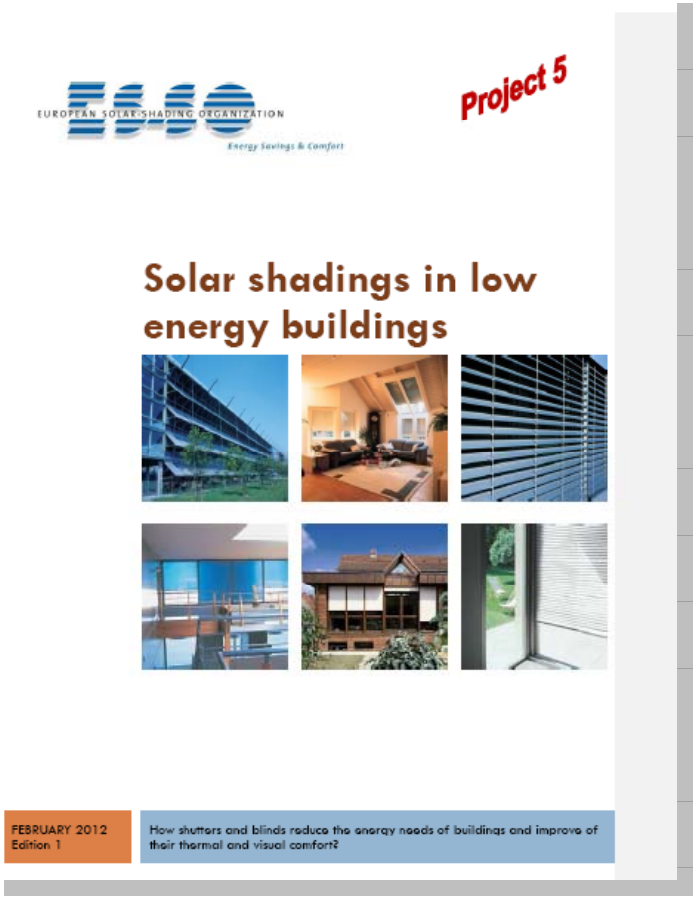
Important to involve all stakeholders very early in the planning

Dare to use new techniques and ideas

Take great care in the choice of Glass quality. When combined with Solar Shading the wrong choice can act against you!

The Solar Shading has to be automated. Manual solutions will not bring energy savings

More information...



Thank you for the attention!