NEARLY ZERO ENERGY BUILDING SOLUTIONS
The Nordic Built “Active Roofs and Facades” project, coordinated by Cenergia, has received support from Nordic Innovation, EUDP (DK), Energimyndigheten (SE) and Rannis (IS) allowing strong development of leading Nordic competences in the area of building renovation. This is achieved by the creation of transnational Public Private Partnership models to support the development of nearly zero energy building solutions and associated performance documentation – which is required in the EU building directive.

The proposed cooperation with the building industry on developing models and the demonstration of “Active House” based sustainable renovation is creating a strong Nordic alliance.

The project runs from 2014 to 2017 and involves companies which are represented in the Nordic countries and companies from the international Active House Alliance (www.activehouse.info). The development will use the best transnational competences and networks, creating greater possibilities to export technology.
The Active House Radar is used to label qualities concerning energy, comfort and sustainability, and includes a focus on “Performance documentation”

Nordic Residential Building Stock

Nordic residential building stock 1960 - 1989

Nordic Residential buildings by country, constructed floor area and construction decades
JUST SOME OF BEST PRACTICE TECHNOLOGIES IN FOCUS IN THE NORDIC BUILT ACTIVE ROOFS AND FACADES PROJECT.

AventaSolar collector roof panels

Cross section of the lower part of the AventaSolar collector showing individual components

AventaSolar collectors integrated in the tilted roof
The NorDan Solar concept

Left: Cross-section of the collector facade with 1) long and 2) short collector window, 3) standard window combined with collector window, 4) The wall behind a collector window is as thermally insulated as a standard wall.

Right: Standardised NorDan Solar delivery package: Collector window, 300 l AventaSolar OSO heat store, solar pump and controller, Uponor pipes with quick-and-easy connectors.

The NorDan Solar concept: First three installations of NorDan Solar in Norway
BUILDER: OBOS
DEVELOPMENT: STENBRÅTLIA, OSLO (NORWAY)
Roof terrace with approx. 14m² Aventa Solar Thermal collector. This technology has a far better yearly COP (coefficient of performance) than outdoor air heat pumps.

Roofs consisting of Aventa Solar Thermal collectors.

The Aventa Solar Thermal collector can be delivered in all chosen lengths, so it fits into a building.

Heat recovery ventilation system.
Innovative heat recovery ventilation design development including window integrated HRV units and integrated automatic filter exchange box.
Unifilter

As an option, EcoVent RT300 can be supplied by our patented Unifilter where there is a plug & play module.

M5 is the standard filter class, but other filter classes are available on request.

UNIFILTER consist of two coils between which the filter medium passes over the smooth rollers, forming a bag filter with 15 in the bags. One reel contains new filters while the other coil is used to roll up the used filters – enough for 10 to 15 years of operation.

The coils are placed in closed cylinders which separates the pure and the used filter from the air stream. When the control system informs the coil motor a new filter will be fed.

The control system also notifies the user of the remaining life of the filter.
Experiences from “Trianon” renovation in Lindängen in Malmö, Sweden

Energy Performance after Renovation

**Before:** Specifik energianvändning 166 kWh/m²
Basår 2012

**After:** Specifik energianvändning 72 kWh/m²

- **Värmeförråd:** 116 kWh/m²
  - After Renovation: 28 kWh/m²
- **Varmvatten:** 30 kWh/m²
  - After Renovation: 24 kWh/m²
- **Fastighetsel:** 26 kWh/m²
  - After Renovation: 20 kWh/m²
Energy Efficiency Directive Article 9 – Metering

- Boverket has investigated cost-effectiveness and technical feasibility for individual metering of heat and domestic hot water, for:
  - New construction
  - Renovation projects
  - Unaltered projects

- Boverkets investigation shows poor cost-effectiveness in relation to technical feasibility

Measures to enhance Performance Documentation

- Common grounds for property owners and builders
- Standardized data for calculations
- Interpretations and clarifications of building regulations and requirements
- Measures to facilitate and coordinate energy management in construction stage
- Quality assurance, for both the builders, property owners and end users
INNOVATIVE USE OF BUILDING INTEGRATED PV SYSTEMS BIPV
Performance documentation by IC-meter:

Energy Balance for the Entire Building

- Central heat actual indoor temp. 5,602 kWh
- Savings if 20 °C indoor 1,326 kWh (24%)
- Passive solar: 177 kWh
- Specific heat losses: 514 W/°C

Energy label and yearly consumption

- Energy label: A 2015 (Calculated after BE10 - Denmark)
- Energy Supply: 85,055 kWh/year (22 kWh/m²/year)

- Measured data calibrated to 20 °C indoor and standard DK-Weather conditions
In the long term solar energy will be very important on a global scale.
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