A developer's perspectives on Urban Home Ventilation

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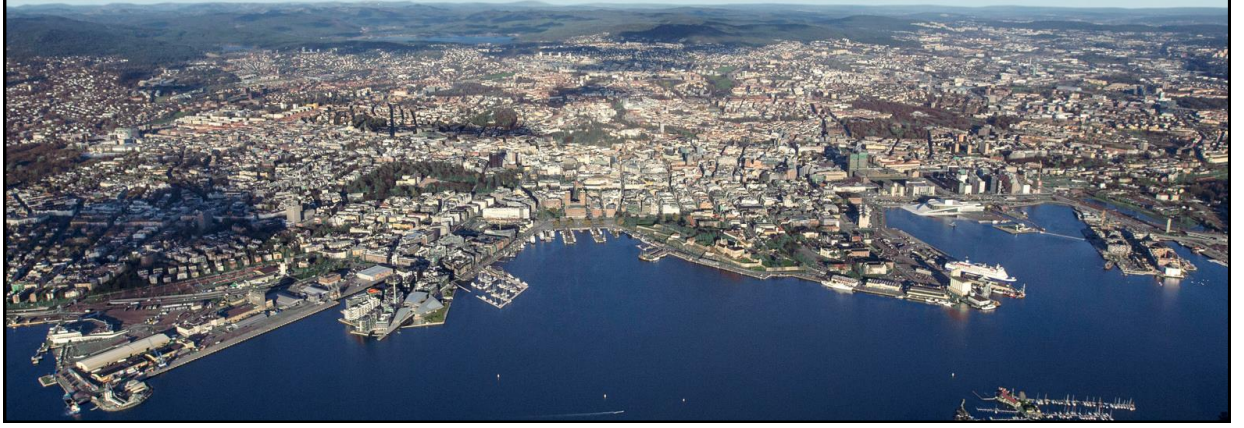
Long-term housing development

- **Nearly 60 000 homes** over the last 70 years
- **Urban development**, large projects in fast growing urban regions
- **Housing for all**, competitive housing offering



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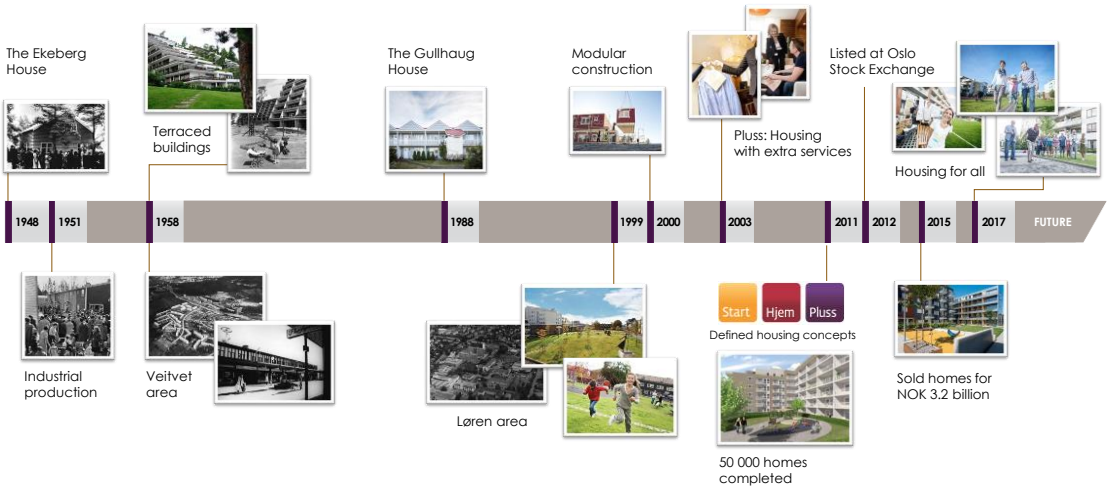
Selvaag Bolig is a story about development



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A story about affordable homes for everyone

- Selvaag has always challenged regulations and established standards in order to fulfill thousand of families dream of owning their own home.
- Wright now are the challenged urban sustainable development.
- How do we provide energy efficient indoor climate in new homes located on polluted noisy transportation hubs?
- I believe sufficient ventilation must be optimized with energy use for heating, cooling and hot tap water.

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Home ventilasjon, changes over time

- Home ventilation has been almost unchanged before use of balanced ventilation
- Until 1985 was the regulation limited to things like
  - Demand of fresh air supply, 150-300 m^3/h, to room with fireplace
  - Livingroom and bedrooms only needed to have a window that could be opened.
  - Ventilation from kitchen was solved with ducts up abode the roof. Fan was first mentioned in 1969.
- Building regulations of 1985 and 1997 only gave functional requirements. Ventilation should ensure proper indoor climate for people in the home. Each room should have ventilation based on its functions. Kitchen, sanitary room and vet rooms should have air exhaust. There was no demand for exhaust fan.
- Use of mechanical ventilations / exhaust fans became more and more common in multifamily houses from the 1970, even though it was not required before regulations in 1997.
- Ventilation openings for inlet of cold outdoor air used to be the most common solution before new energy regulations in 2007, (TEK07).
- Energy regulations gave us balanced ventilation with heat recovery.

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Regulations on residential ventilation in TEK17

- TEK17, §13-2. Ventilation in residential buildings.
  1. Dwellings shall have ventilation witch ensure average fresh air supply of minimum 1,2 $m^3/h*m^2$, (used to be a half air changes each hour).
  2. Bedroom shall have a supply of minimum 26 m^3/h for each bed
  3. Rooms without permanent residence shall have a ventilation of minimum 0,7 $m^3/h*m^2$
  4. Kitchen, bathroom, toilet and other vet rooms shall have sufficient exhaust
- In new dwellings are the required ventilation obtained with balanced ventilation with a heat exchanger.
- Decreased air change can be obtained by opening windows if that is compatible with outdoor air quality and noise from the surroundings.
- Tomorrows development of new residential areas on transportation hubs will require sufficient ventilation and indoor climate with closed windows due to outdoor air quality and noise.

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Costumers expectations on indoor climate

- Most costumers simply expect that the ventilation system supply fresh air and exhaust polluted air in order to keep a comfortable indoor climate. They don't care about air changes and fresh air amounts.
- In general has the possibility of opening windows been an expectation. Most Norwegian sleep with an open bedroom window.
- We experience a decrease in claims due to limited possibility of cooling the dwelling during summer. Decreased air changes don't help when it's warm outside for a long period
- Costumers expects thermal comfort beyond todays delivery and regulations. They want to adjust the temperature the same way as in their premium cars.
- Tomorrow's costumer will demand energy efficient heating and cooling in their homes.
- We must realize that there is no way around cooling!

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Possible future scenarios for home ventilation

- Dwellings in urban areas will need sufficient ventilation without use of open windows.
- In addition to the basic function of ventilation, supply fresh air and exhaust polluted air, will we need heating and cooling in the apartments.
- I believe the ventilation system will be the main system for heating and cooling.
- We must design sustainable energy systems where energy for cooling the air are used to heat tap water.
- Heating with ventilation air are disputed and must be limited.
- Use of district heating for base ventilation heat and hot tap water.
- Peak heating in cold periods solved with electricity.

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