REPEATING MISTAKES
LARS-ERIK MATTILA  CABINETMAKER, ARCHITECT  SUOJA RF / AINA ARCHITECTS  12.11.2021
1 §
General objective of the Act

The objective of this Act is to ensure that the use of land and water areas and building activities on them create preconditions for a favourable living environment and promote ecologically, economically, socially and culturally sustainable development.

The Act also aims to ensure that everyone has the right to participate in the preparation process, and that planning is high quality and interactive, that expertise is comprehensive and that there is open provision of information on matters being processed.
ENERGY EFFICIENCY
LIFE-CYCLE ASSESSMENT
CIRCULAR ECONOMY
CARBON FOOTPRINT
RECYCLING
SMART TECHNOLOGY
WOOD CONSTRUCTION
ZERO ENERGY BUILDING
TYPICAL SOLUTIONS IN APARTMENT BUILDINGS

- Loadbearing structure
- Outer wall
- Floor
- Ventilation

1900 | 00's | 10's | 20's | 30's | 40's | 50's | 60's | 70's | 80's | 90's | 2000-

- Brick
- Mixed
- Concrete pillar
- Concrete wall
- Concrete bookshelf
- Concrete bookshelf (concrete element standard BES)
- Two brick wall
- One and a half (hollow-) brick wall
- Concrete wall + aerated concrete insulation
- Concrete sandwich element
- Wood floor
- I-beam (steel)
- Concrete beam + slab
- In situ concrete slab
- Precast concrete slab
- U-slab
- Hollow core concrete slab
- Natural ventilation
- Mechanical exhaust
- Mechanical intake and exhaust
Typical wall structure before the advent of industrial construction

Typical wall structure after the advent of industrial construction

Typical wall structure after the promotion of sustainable development became the general objective of The Land Use and Building Act.
<table>
<thead>
<tr>
<th>CATEGORY</th>
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THE LIFE CYCLE OF A BUILDING

- DESIGN AND CONSTRUCTION >1 year
- USE for example 50 years
- END-OF-LIFE
- COMPLETE RENOVATION
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**THE LIFE CYCLE OF A BUILDING**

- **DESIGN AND CONSTRUCTION**: >1 year
- **USE**: for example 50 years
- **COMPLETE RENOVATION**:
- **END-OF-LIFE**

- **€**
- **CO₂e**

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THE UNSPOKEN SIDE OF CIRCULAR ECONOMY

- MATERIALS TOO COMPLEX TO RECYCLE
- ENERGY SOURCES CANNOT BE RECYCLED
- INPUT EXCEEDS OUTPUT
- ALL MAN-MADE SYSTEMS ARE TEMPORARY
- NO LOOP CAN BE FULLLY CLOSED
RECYCLING RATE
92%

8% LEAK
30 900 000
TODAY
CONTEMPORARY WOOD CONSTRUCTION
1 m²

CONTEMPORARY WOODEN MULTI-STORIE BUILDING
2000 gross m²

Ransu Helenius & Lars-Erik Mattila 2018
CONTEMPORARY WOOD CONSTRUCTION
1 m²

CONTEMPORARY WOODEN MULTI-STOREY BUILDING
2000 gross m²

WOOD CONTENT
15–32 %

Ransu Helenius & Lars-Erik Mattila 2018
Image based on: Puun määrä nykyisenlaisissa puukerrostaloissa: Häkkinen, Tarja – Vares, Sirje 2017: Rakentamisen hiilivarasto
CONTEMPORARY WOOD CONSTRUCTION
1 m²

WOOD CONTENT
15–32 %

GLUE CONTENT
1–8 %
(0,5–4 kg)

CONTEMPORARY WOODEN MULTI-STOREY BUILDING
2000 gross m²

WOOD CONTENT
15–32 %

GLUE CONTENT
1–8 %
(5000–40000 kg)

Image based on: Puun määrä nykyisenlaisissa puukerrostaloissa: Häkkinen, Tarja – Vares, Sirje 2017: Rakentamisen hiilivarasto
Traditional log wall. Logs can contain 65 kg/m³ bound water at RH 75 %.

Traditional sawdust insulated wall. Sawdust can contain 19 kg/m³ bound water at RH 75 %.

Contemporary cellulose fibre insulated wall. Cellulose fibre insulation (37 kg/m³) can contain 4.1 kg/m³ bound water at RH 75 %.

Contemporary mineral wool insulated wall. Mineral wool insulation can contain 0.36 kg/m³ bound water at RH 75 %.
YESTERDAY

TODAY
50 years: the typical planned working life for contemporary buildings

100 years: the time it takes for a tree to grow (in Finland)

SUSTAINABLE WOOD CONSTRUCTION

UNSUSTAINABLE WOOD CONSTRUCTION

Ransu Helenius & Lars-Erik Mattila
YESTERDAY  TODAY  TOMORROW
2100

Lars-Erik Mattila
NEW BUILDINGS

OLD BUILDINGS

= BUILDINGS
NEW CONSTRUCTION = CONSTRUCTION

RENOVATION
THE KEY QUESTIONS IN CONSTRUCTION:

IS IT REALLY NECESSARY?

DO WE KNOW:
- WHAT SUBSTANCES BUILDINGS CONSIST OF?
- WHERE DO THESE SUBSTANCES COME FROM?
- WHERE DO THEY END UP?
- IN WHAT TIME?

IS IT SUSTAINABLE?
(= CAN IT BE REPEATED INDEFINITELY?)
YES
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