Benefits of High-rise buildings –

Sustainable construction, case Kalasatama

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Elämäsi rakentaja.


”We shape our buildings
and thereafter they shape us.”
-Winston Churchill


Kuva M.Airaksinen

Real estate and construction sector in Finland:

- 83% national wealth
- 60% investments
- 15% GDP
- 20% employment
- 35% energy consumption
- 32% CO2 emissions
- 32% use of virgin materials (more than any other industry)
- 5. biggest industry in land use
- 6. biggest industry responsible for the biodiversity loss
- 50% of the deforestation is due to construction

SRV

Urban areas are driving innovations

- Urbanisation is one of the biggest megatrends
- In Europe 80% of the people are living in cities
- 85% GDP is originated from cities
- 90% of the innovations are originated from cities

Kalasatama

- Brown field development
- Shopping centre
- Apartments and work places
- Metro and bus lines

SRV has 80% of the market share of the high rise buildings in Finland

MAJAKKA 2019

134 meters
282 apartments
35 floors

LOISTO 2021

124 meters
249 apartments
32 floors

LUMO ONE 2022

121 meters
291 apartments
31 floors

VISIO 2023

98 meters
240 apartments
395 m^2 kindergarten
24 floors

HORISONTTI 2025

Office building
111 meters
26 floors
Rooftop restaurant and terrace

Three more residential towers will be built in the Kalasatama area.

SRV

Landuse

50% of the deforestation is due to construction

13 000 m²

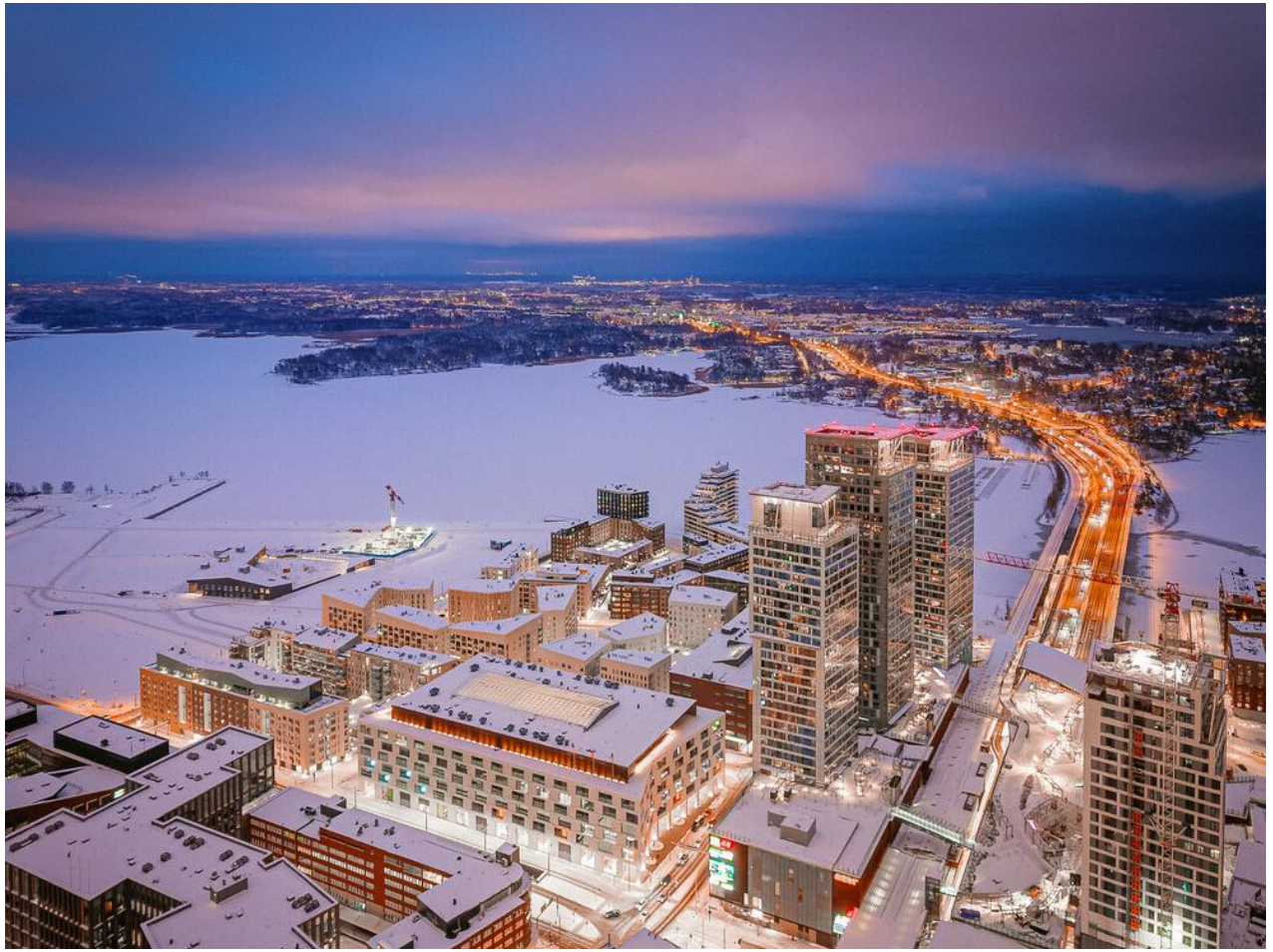
→240 apartments in a high rise building

→1000 m² land use for the building (excl. garden)

OR

→110 single family homes

→6500 – 12 500 m² land use for the building (excl. garden)



SRV

Construction Biodiversity programm

Carbon neutrality, circular economy and biodiversity are supporting each others

Drivers for biodiversity loss	Examples of prevention
 Land use changes	Transfer of habitats from the construction sites to eco-system hotels, ecological bridges, increasing biodiversity in brown fields, saving biodiversity in green fields, especially trees
 Use of natural resources	Minimising material use and loss of materials at construction site (Lean construction) Circular materials and components (material reuse, recycle and material recovery)
 Climate change	Low carbon materials, renewable energy and energy efficiency including demand side management
 Pollution	Plans and good practices of chemical handling
 Non-native species	Prevention of the spread of non-native species, e.g. transfer of soil and rocks

SRV

Life cycle wise construction site

All SRV construction sites have been net zero carbon sites from the beginning of the year 2022.

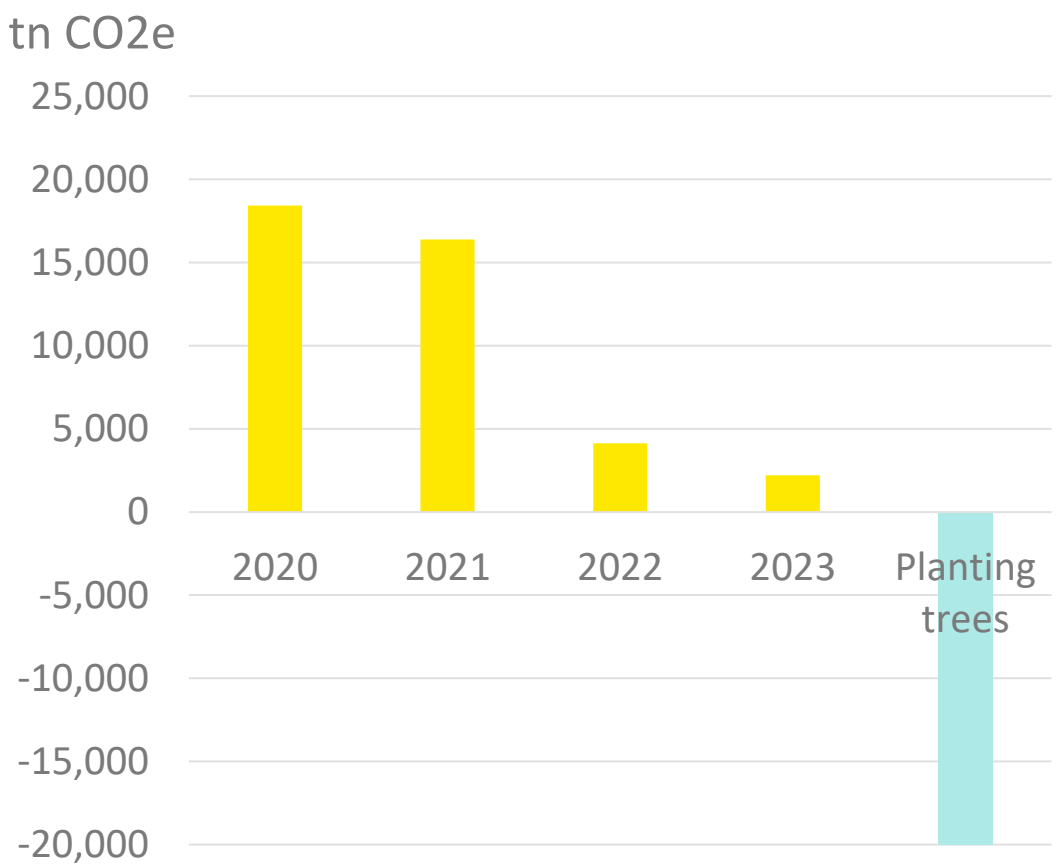
Zero emission construction site

- Energy efficiency
- Carbon neutral heating and electiricy
- Bio fuels

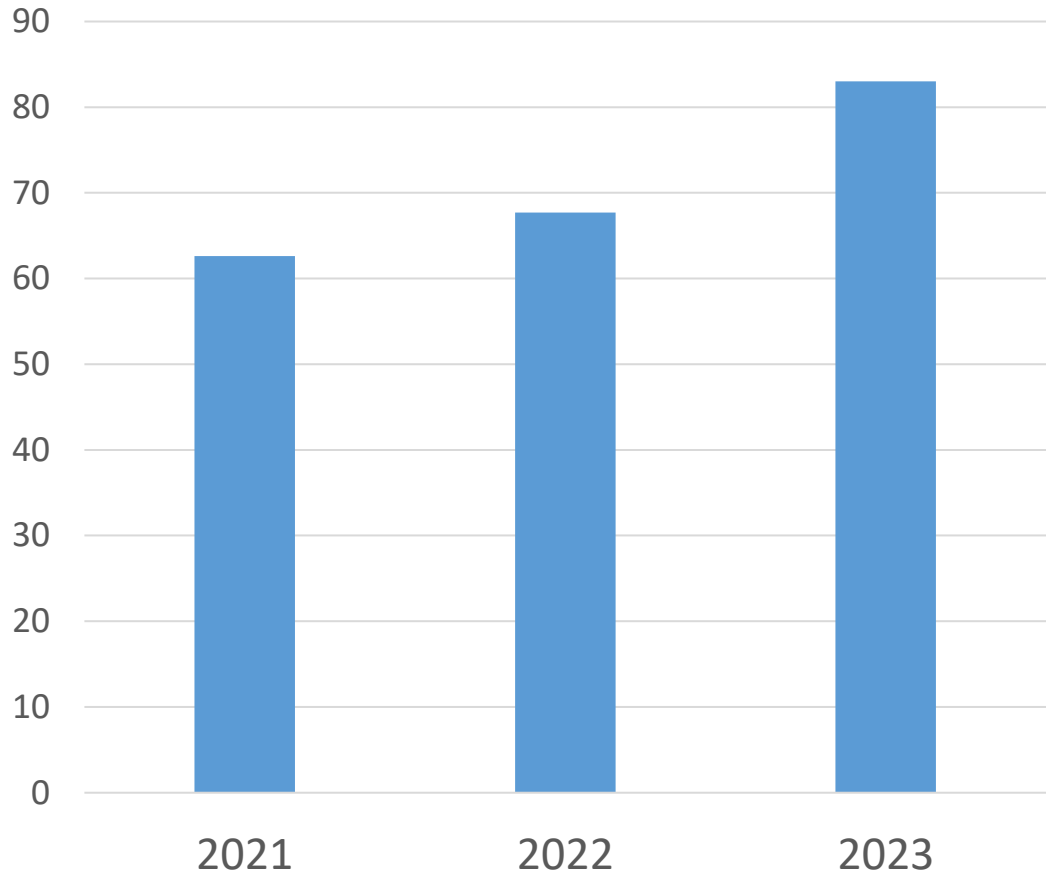
Circular Economy

- Minimizing raw material use
- Recycling and re-using
- Sorting waste 83%
- Re-using the waste 98%

Carbon emissions, Scope 1+2 (tn CO2e)



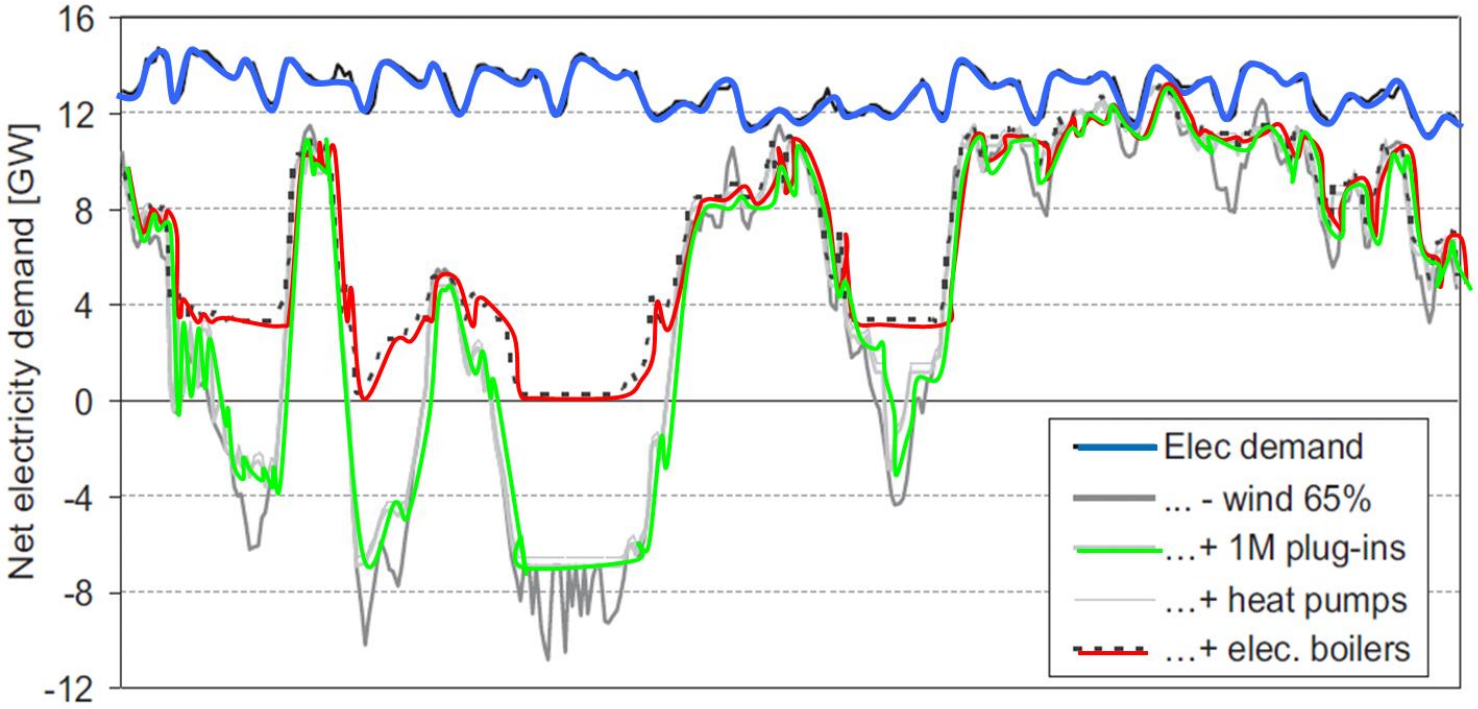
Waste sorting rate (%)



Energy system

- *Fingrid estimates that in the year 2027 wind power will produce more than nuclear power. In addition, the solar power is estimated to increase at the same level as the hydropower*

=>resiliency and demand side management is needed, as well as all other components



Source: Kiviluoma J, 2013, VTT
http://www.vtt.fi/inf/pdf/science/2013/S35.pdf

SRV

Power demand, we need smart buildings

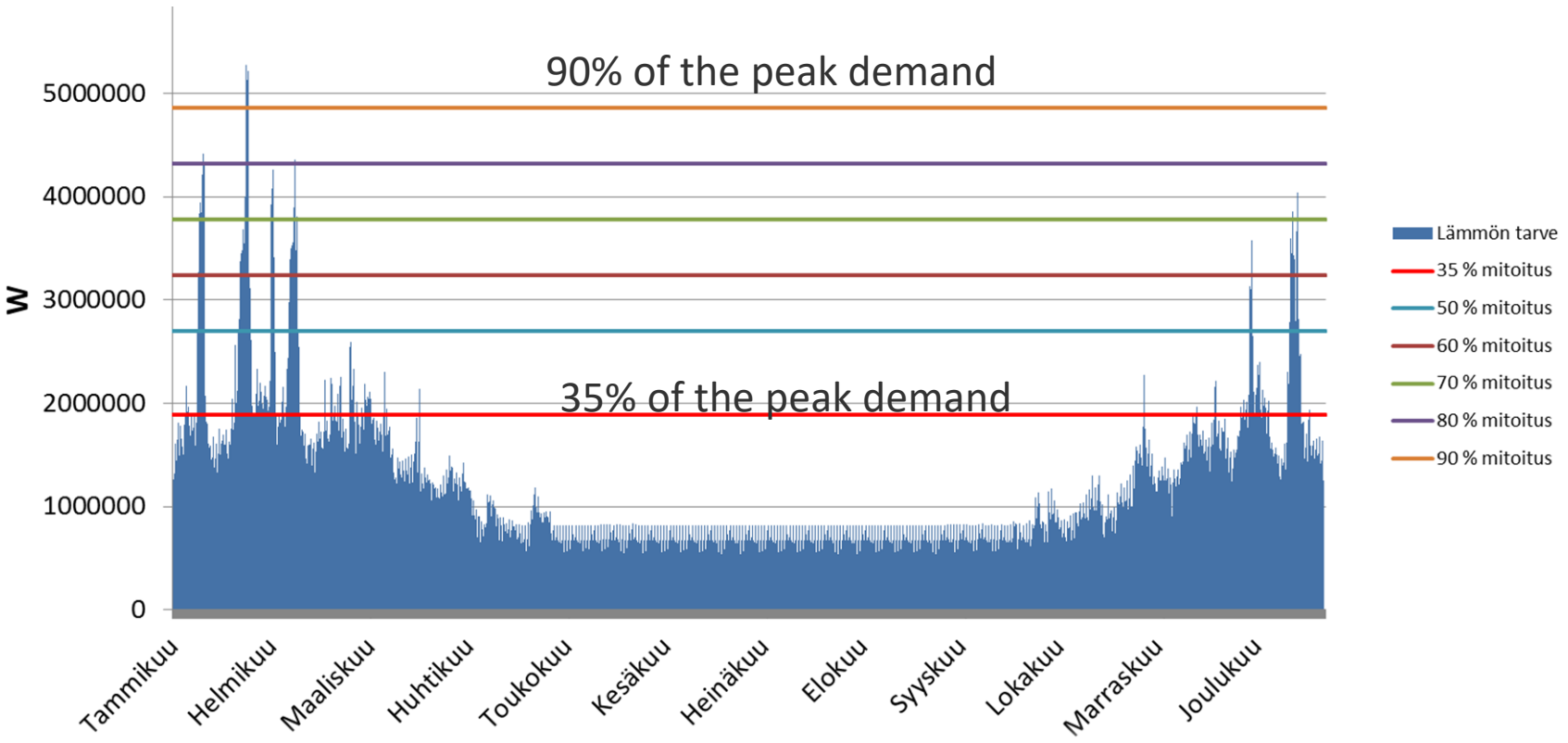


Figure: VTT Co-ZED-project

SRV

Smart HVAC systems, predictive systems and cyber security

- According to recent research 40% of reserve power can be avoided
- Peak power demand can be reduced at least 10-25% in offices and commercial buildings
- Predictive and adaptive systems can save 10-30% energy without compromising wellbeing (VTT Human Thermal Model)
- Need for rea time data
- The amount and quality of cyber attracts is increasing

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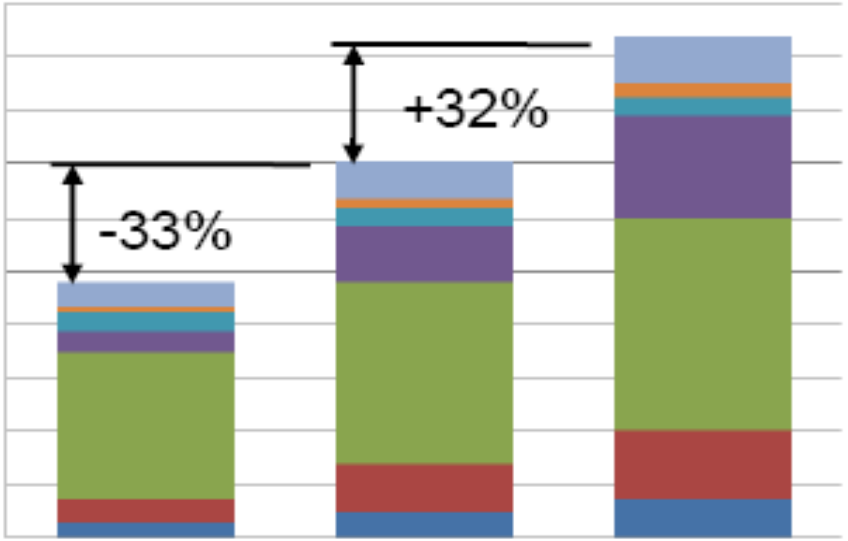
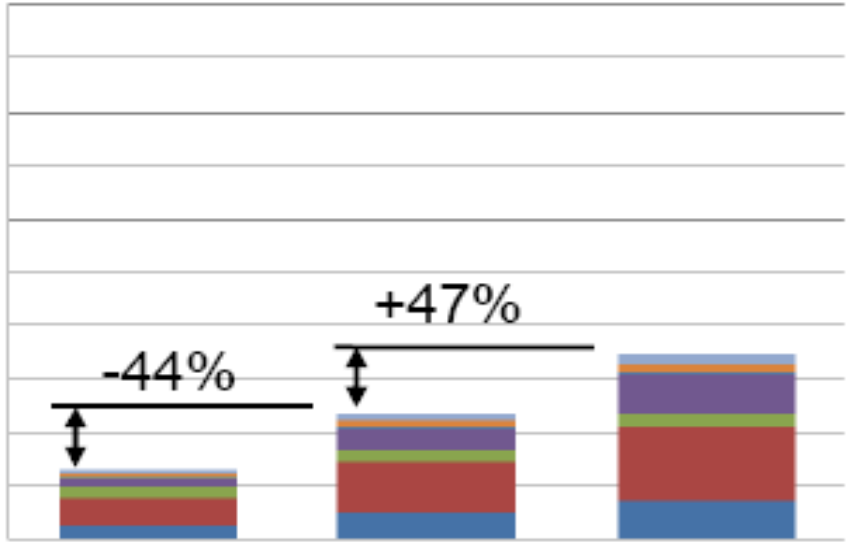
User interface

- Showing the consumption and possibilities to adapt/change consumption or time of the consumption
- In Kalasatama e.g. heating, cooling, water use (heat and cold), electricity
- Integrated other services! (E.g. recycling tools, books etc. remote Sauna system, gym)



Typical rather new building



Low energy building

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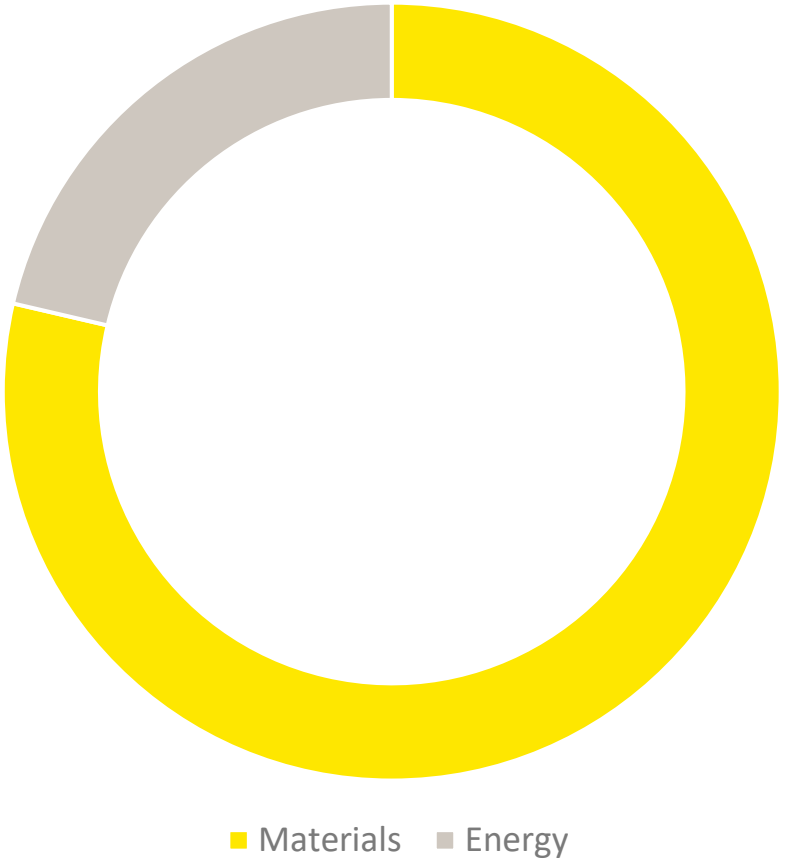
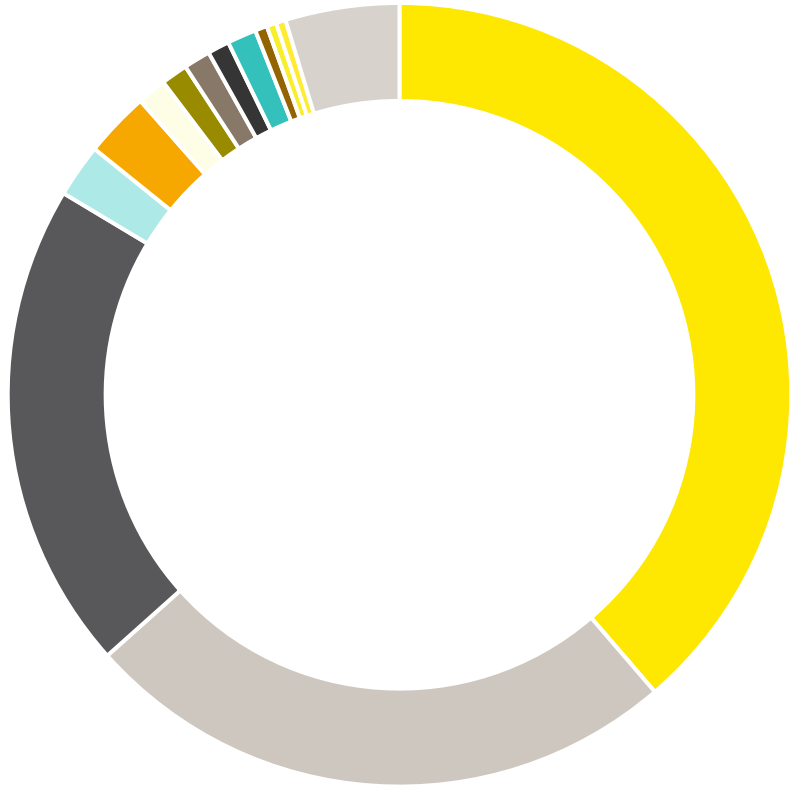
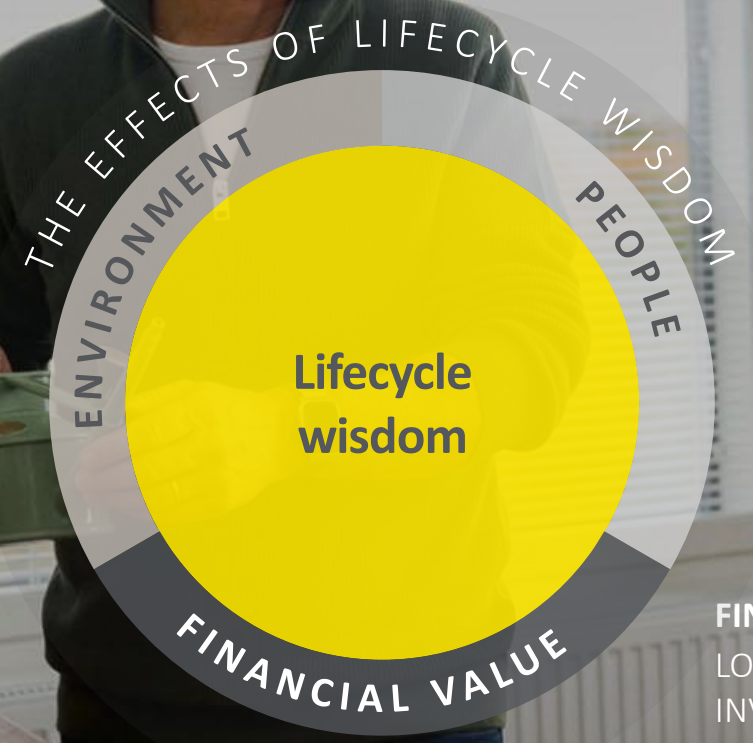
Since energy need is low, materials play a big role

- Design
- Windows
- Efficient energy systems




Concrete
Glass
Steel
Ventilation
Gypsum
Masony blocks
Elevators
Electirictiys
Heating palstic pipes
Wood
Leca
Aluminium
Stone wool insulation
Other

SRVLifecycle wisdom creates value in every project



ENVIRONMENT

LOW CARBON FOOTPRINT

- Zero carbon energy and fuels at site
- 99 % waste recovery
- Renewable energy in buildings
- Energy recovery
- A energy class
- 30–50 % lower water consumption
- 15–40 % lower material emissions
- Biodiversity

PEOPLE

BETTER LIVING AND WORKING ENVIRONMENTS

- IAQ classification S1 or S2
- Well certification
- Adaptable spaces supporting new ways of working
- Urban green recovery spaces
- Natural light
- Haptic environments
- Connectivity and services

FINANCIAL VALUE

LOWER MAINTENANCE COSTS ADN ATTRACTIVE INVESTMENT

- LEED, BREEAM or RTS certification
- 25–35 % lower life time costs
- Demand side management
- 8-12 % Green premium
- 8 % Higher rental rate

What people want?

- Privacy
- Green and blue areas
- Sufficient amount of services
- Not too long distance to work place
- An apartment which they can afford
- View

Lähde 10 Principles for Liveable, High-Density Cities (ULI)






Increasing well-being and biodiversity in a dense urban environment

SRV "suunnannäyttäjät": 90% valued green areas important of very important

Kalasatama

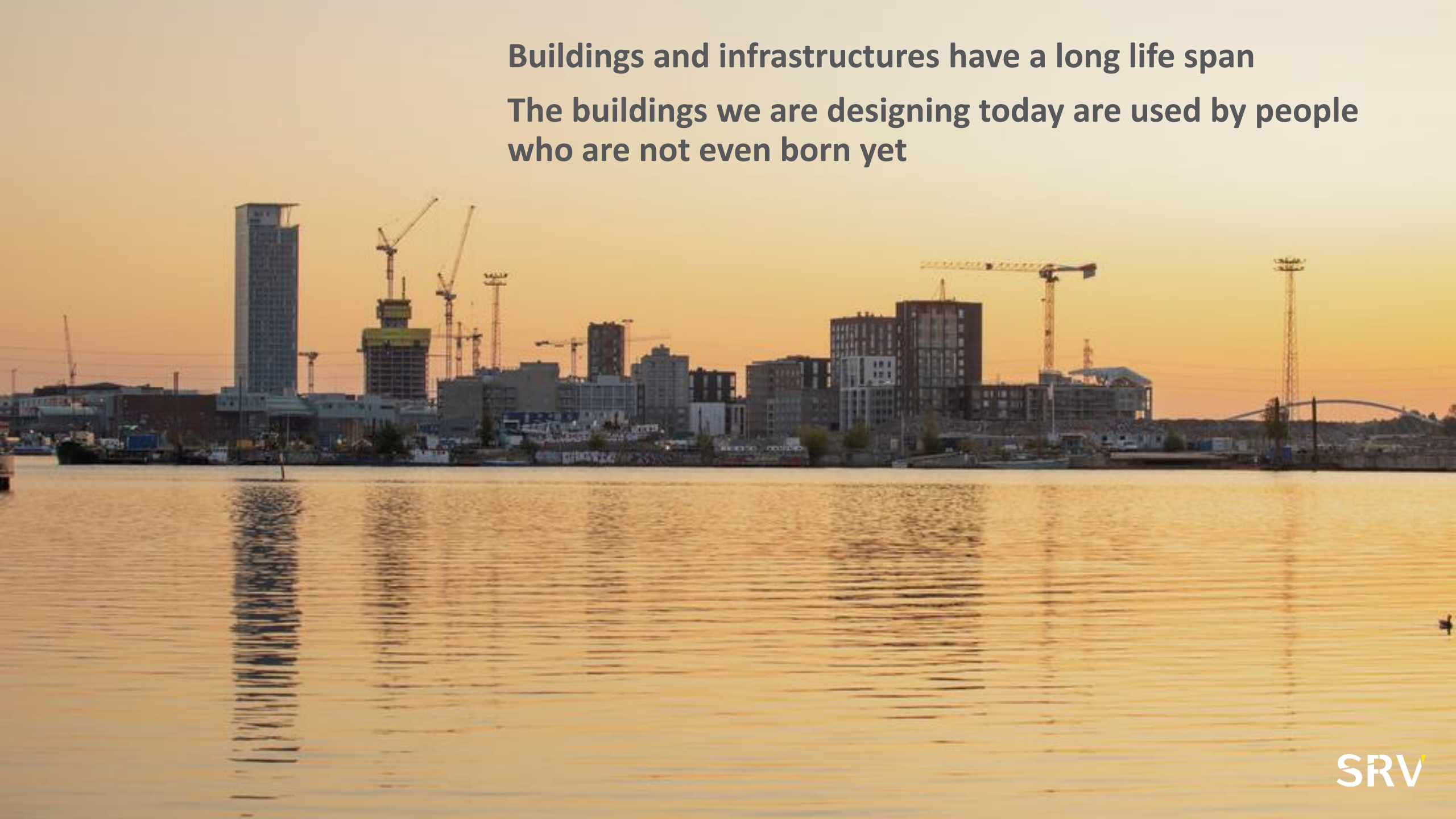
More than 50 different plants (food for insects and safe places for birds)

Moisture absorption

Avoidance of urban heat island effect

Dynamic planting and rotten wood

Since above ground, no noise



Buildings and infrastructures have a long life span

The buildings we are designing today are used by people who are not even born yet

Thank you!