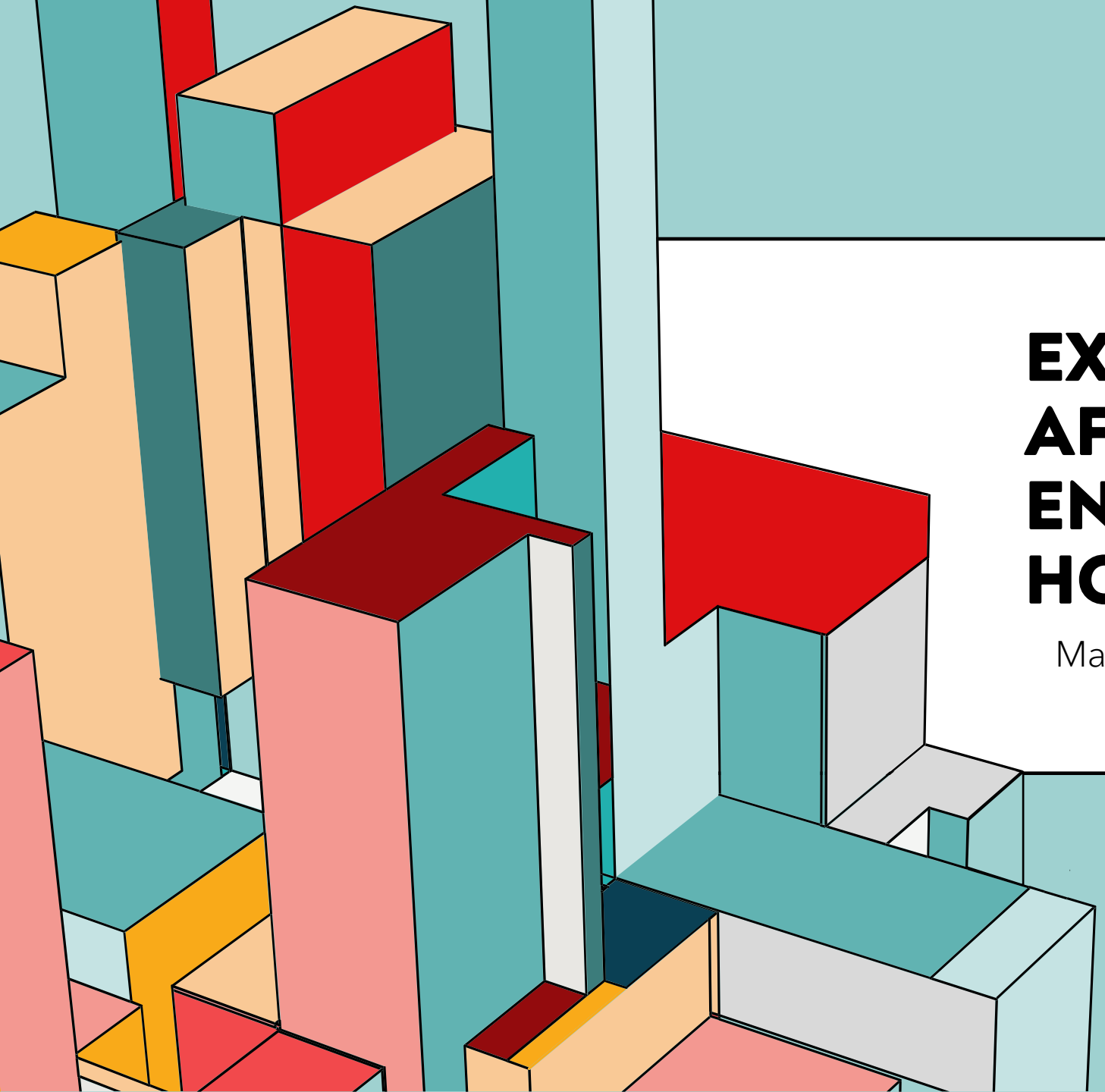


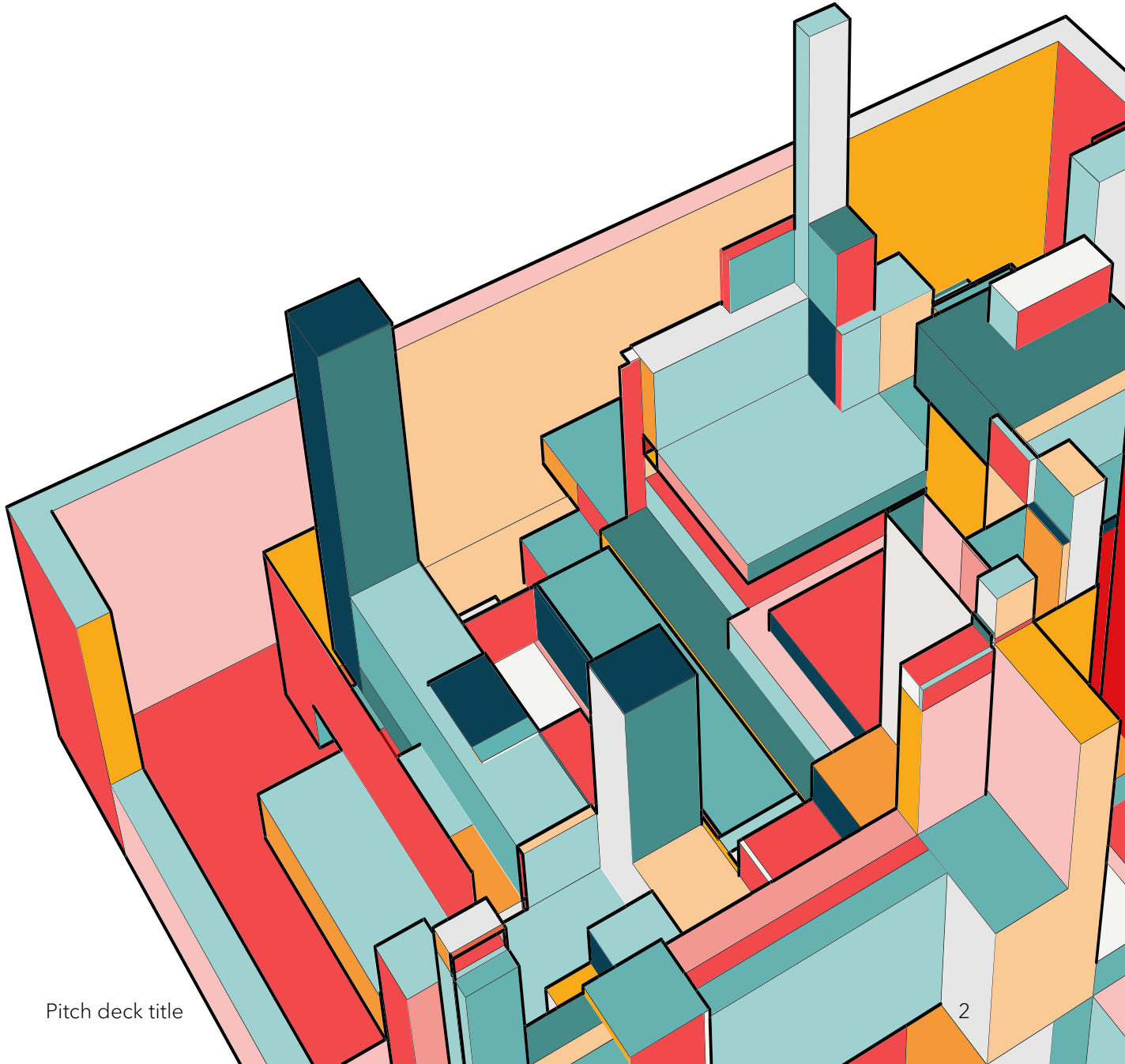
EXAMPLES OF AFFORDABLE AND ENERGY-EFFICIENT HOUSING IN FINLAND

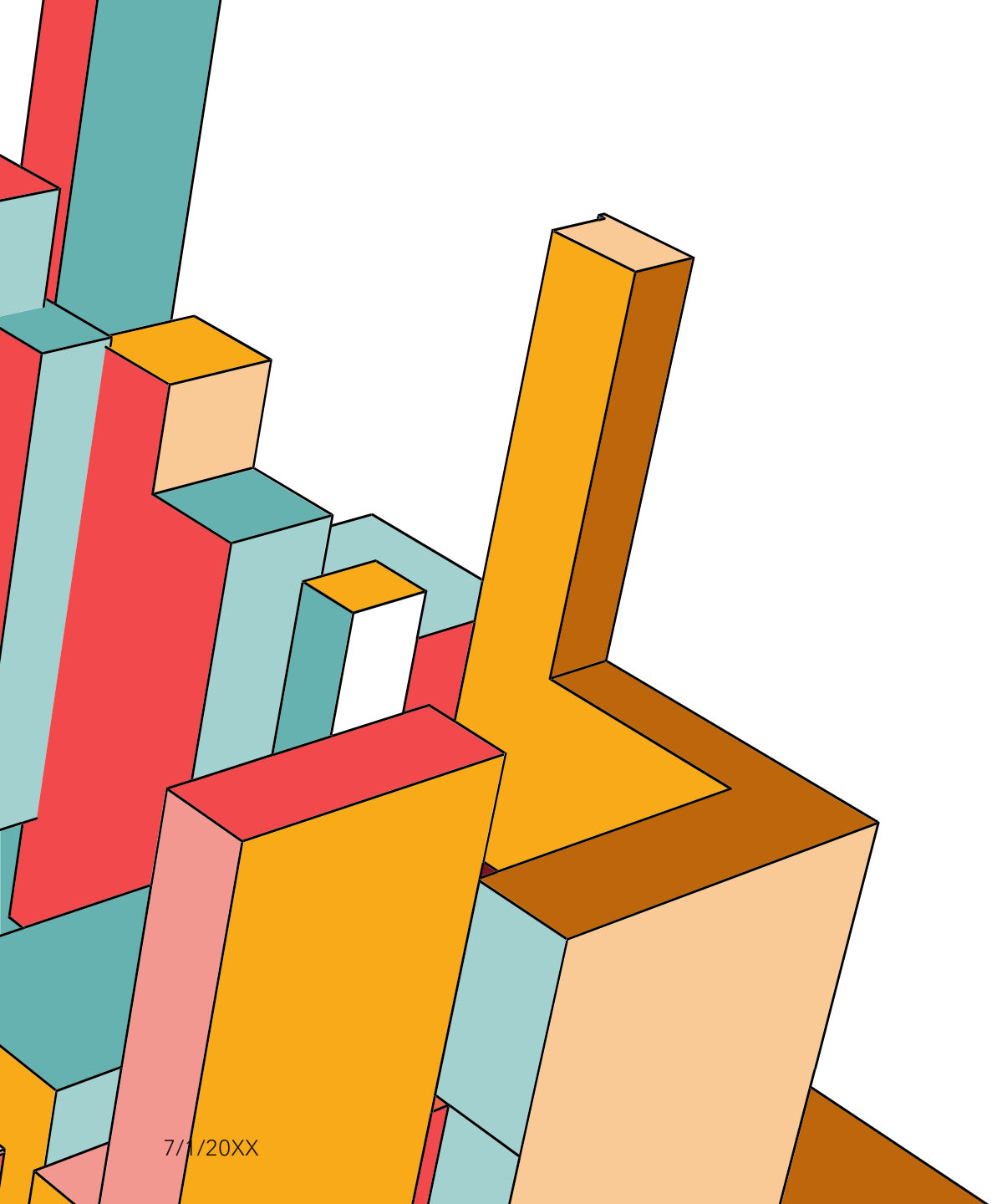
Marko Nokkala

SOCIAL HOUSING PRINCIPLES

Focus on:

- Identified user groups and their needs, including elderly and disabled persons
- Safety (materials science, structural works, evacuation plans, shelters etc.)
- Affordability (including prefabrication of elements and use of recycled materials
- Energy efficiency (temperature controls, solar PV systems, automated lights etc.)
- Comfort (air quality, space, ventilation, passive housing)





TYPES OF HOUSING MODELS IN FINLAND

Municipal rentals

Typically for subsidized rentals, municipality workers, homeless, disabled BUT with also “average” tenants

Private rentals

Several housing companies provide rental apartments, “market-based” rents

Private individuals and foundations also offering rental apartments

ARA(VA) housing

Government subsidized privately constructed housing with selection criteria for tenants to meet the government funding requirement.

ASO housing

Latest model where owner/tenant is to invest 15% of the value of the house and pays a monthly fee (similar to rent) for residency. Upon leaving the unit the tenant will receive the initial payment + indexed value change but will not be able to own the unit.

BUILDING NEW

MIXED USE

Design new areas with various residential groups and services in mind, allow for mix of rental and owned property.

COSTS

Can be shared with private sector if incentives are given for instance in the form of land for properties in exchange for social housing construction

CUSTOMERS

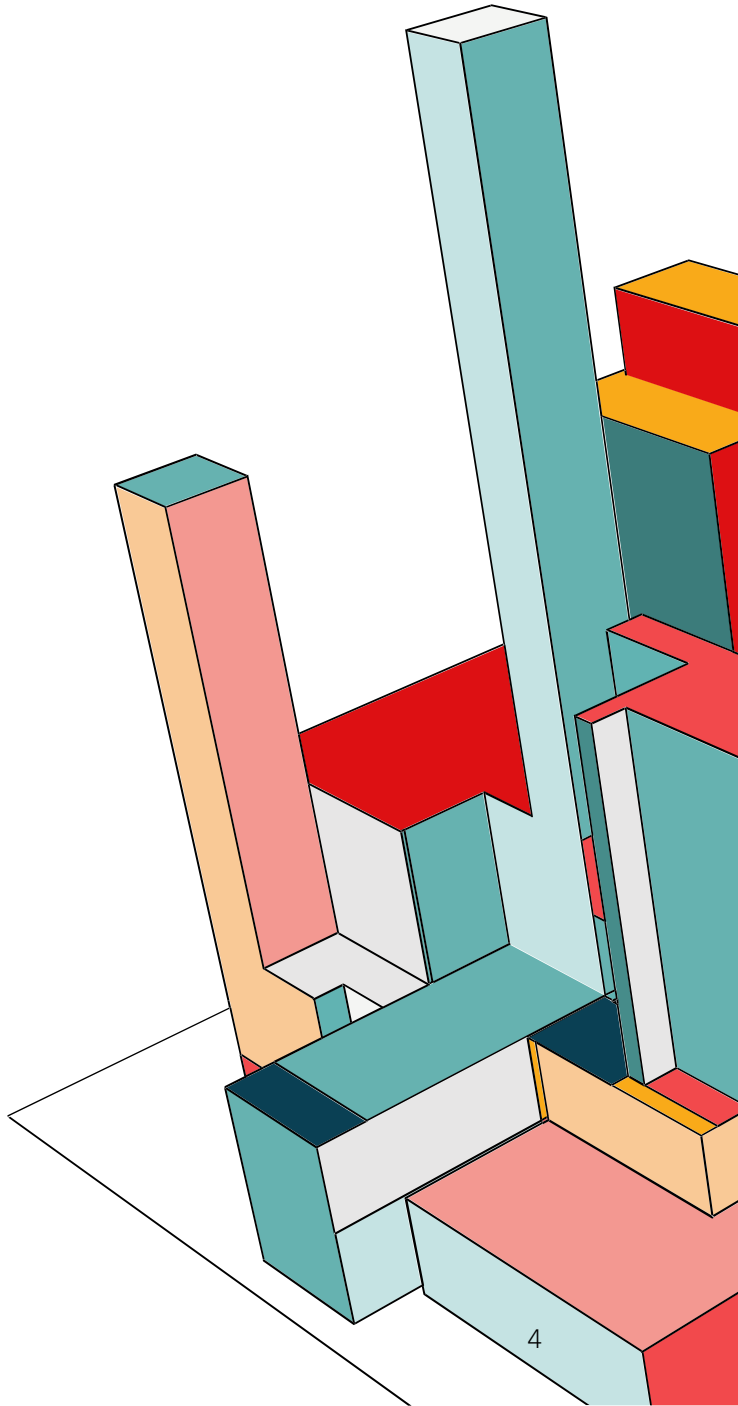
Define the customer groups and ways to provide them affordable housing at rent levels below private market

USABILITY

Customers in the need of modernization and also energy efficient solutions but also considering combining public institutions like childcare, libraries or health clinics with social housing.

FINANCIALS

Develop models of refinancing for instance by own-as-you-go models and co-ownerships



EXAMPLE: STUDENT HOUSING AT KUOPIO FINLAND (2011)

- Main features:
  - 43 units with accessibility (for disabled students)
  - Build in partnership to reduce the construction costs
  - Net energy consumption annually 0 KWh/m2
- Energy from solar panels (each unit has window facades with panels) and geothermal
- First of its kind in Finland, awarded energy savings award in 2011

PASSIVE HOUSING CONCEPT

- Energy flows in the apartments controlled by HVAC systems, no “natural ventilation”
- Triple-glazing windows a must when temperature fluctuations are -25 to +25 and greater during a year
- Effectively reducing heat losses and at the same time provide cooling in the hot season
- Unit-controlled temperatures from central operating room, ventilation adjusts to temperature changes, technology providers available in local market in Finland
- Benefits: Minimize heat and cooling needs (and losses), create a steady environment for living

“SKIN SENSITIVE” OFFICE BUILDINGS

- Principle: people’s skin is the measure of required heating/cooling
- Can be adjusted by hours or work, number of persons in the room, clothing etc.
- Creates a micro-climate for each confined area to optimize the well-being and use of cooling and heating
- This has been tested and prototyped already years ago

THANK YOU

Marko Nokkala

Marko.Nokkala@gmail.com