Breakout session 1: Building , Culture, Wellbeing

(1) Richard Boyd - Servicing the circular economy

- Collaboration with UCL, Schneider Electric, AECOM, ARUP
- Circular economy (CE) is critical for SDG goals
- Goal: Keep resources in place to benefit the most from it
- Looking beyond current building standards
- Application to real test case was wanted → Marshgate project
    - Mixed building project
    - Use for living, teaching, eating, etc.
- Barriers/Challenges of CE:
    - Universal (simple, easy buildings, better to change and adapt to different needs→ usable on a larger scale)
    - Joint venture (share gains & pains, align stakeholders responsibility, rewarding joint ventures, product as service models)
    - Self-sufficient (less waste, reuse of waste and resources)
    - Passive (minimize use of active systems, create environment that needs no active systems)
    - Pre-loved (incorporating second-hand equipment in new buildings, increased market need & value of 2nd hand equipment)
- Identification of cross-cutting themes through interviews
- Barrier: Lack of data (e.g. about performance of passive buildings or how well 2nd hand equipment is performing)
- Opportunities: Cost & value performance (lower risk)
- Collaboration: Being clear about preliminary outcomes & communicating them (collaboration needed for sharing data); C. throughout whole supply chain
- Challenge: Think beyond traditional sustainability in areas of business model
- Most difficult scenario? 5 scenarios are not supposed to work individually, but all together complementary; Pre-loved is most difficult → no market maturity
- Current draft: Set of questions about the purpose → different set of scenarios as answer
- Currently focus: Understand people's perceptions and needs
- Difficulty:
    - How will needs look like it 60 years? Scenarios shall define barriers
    - Project definition
    - Assessment themes
    - Creating long-term value

(2) Mari Läyttiniemi - Aalto Green Campus and new headquarters in Dipoli building

- Otaniemi: Main campus of Aalto University in Espoo, Helsinki
- Concentration on only one campus (while earlier there were three)

- Outside energy production at campus: solar, wind, geoenergy, geothermal → results communicated through lobby displays
- ACRE: Aalto University Campus & Real Estate (drivers of project)
- Goal 2030: To be self-efficient, but might be too challenging
- Main building (Dipoli): Auditorium, meeting rooms, restaurants, offices, etc. → multi-pupose
- Hot-desking: Noone has a desk of their own in the building (not even the president)
    - Argument: cost-saving
    - It was tried out by a part of the employees before
    - It can be very challenging, the opinions about it vary
- Dipoli's initial purpose: Student union building
    - completed in 1966
    - in 2010: bought by university
    - renovation: 20 months
    - cost: 24 Mio. €
    - building is protected, since it is Finnish heritage
    - 14.000m² surface
- Geoenergy in the building
    - 17 dwells
    - provides currently ~50% of heating & cooling of the building (more cooling)
    - expectation to last at least 25 years
    - investment (total): 250.000€
    - payback time: 5-10 years
    - possibility to install solar panels
- Other sustainability aspects:
    - safety during renovation
    - service design as a tool → including all stakeholders
    - recycling
    - …
- Academic collaboration & user engagement in workspace design
    - Energy solutions: e-cars & campus bikes
    - Learning restaurant: Healthy & veggie favourable
    - Exhibition space: Strongly visible arts
- "The building is only a beginning. It's not ready neither final - rather an endeavour or direction" - the architect
- Biggest challenge: high number of stakeholders →lots of expectations to align
- Challenges/opportunities from old building:
    - 4th floor was too expensive
    - Disappointed that no solar panels could be installed (so far)
    - Not all spaces were redone (e.g. gala hall)
    - Original walls were kept →no specific need for new insolation
- Data of project is shared online for academia & research → most difficult resource: manpower to clean it up

- Hot desk:
    - for space reduction reasons → Is it actually reasonably/efficient on comparison to the employee efficiency?
    - but they need to make “space” for more people
    - reduction of 30% of space
    - people are mostly happy about activity-based working space
    - support of students to use their own devices
- More awareness should be brought to stakeholders → it’s kind of invisible

(3) Syam Kumar Prabhakaran: Improving energy efficiency through policies and technologies (National University of Singapore (NUS))

- Roots: 1905, main changes in 1980
- NUS sustainability steering committee
    - Energy Task Force (created 2012)
    - Water Management Force
    - Waste Minimalism & Recycling
    - Built Environment
    - Green Space
- Goal: low carbon campus through engineering and tech & practices & policies and management
- Tool: Energy Monitoring (EUI) - Comparison actual vs. target
- Policies:
    - pay-as-you-use for research institutions/centers&admin
    - → empowerment of occupants
    - → savings returned to user
    - → student housing: pay-as-you-use-cards for air conditioning
    - green procurement (e.g. freezers & cabinets)
- Technology
    - chiller plant consolidation
    - chiller plant efficiency improved by 24% + reduced number of chiller plants needed
    - laboratory air change
        - local fire code requirements
        - lab ventilation risk assessments (hazardous substances, activities in lab, heat lead & ventilation demand)
        - optimization of air changes in lab
    - LAB - policies
        - optimal lab layout (space usage)
        - separated air conditioning systems
        - adaption of tech according to need
- Recognition: First green mark platinum lab; pioneer university of applying systems
- Next steps towards low carbon campus
    - district cooling system
    - use of renewable energy
    - SMART campus (test bed for smart cities)

    - use of tech & IT in every optimization (→research collaboration + use of business analytics)
- Current/future:
    - strong focus on labs
    - key focus of energy consumption
    - more challenging in tropical climate
    - new building 15-17 levels, labs on high stories
    - extra cooling/heating had to be paid
        - strong incentives are needed
        - most efficient way of making people aware
        - practical solutions for changing mindset
    - currently faculty pays bills
    - smart city movement helps creating use zones → also the smaller the zones, the more data, the higher the need of workforce for handling the data

(4) Tomas Refslund Paulsen: Sustainability at Maersk Tower (Copenhagen University)
- opened 2017

- research & lab building
- faculty of health science was needed
- incorporation in existing environment
- basement: 2 stories of public open space areas (canteen & class rooms) + 15 stories of research levels + top floor: open to public
- competition for building in advance:
    - focus on sustainability
    - fitting into environment
    - asset for the area
- sustainability aspects:
    - energy: high degree of control and monitoring of energy consumption
    - solar panels exist, but can only cover minor part of energy need
    - more efficient: integrated sun shading → reduction of need for colling
    - there is lot of control and monitoring in building → challenge in tech competencies
    - sustainable laboratories
    - strong focus on flexibility (borderless & open transition spaces)
    - ventilation can be changed (e.g. from office to lab space)
    - “freezer” hotel in the basement with district cooling
    - usually labs are pretty closed up; here: open space, plazas on every floor → sharing of best practices and experiences in the design of the building
    - loop ventilation for more flexibility & energy optimization
    - rain water
        - collection & use of rain water
        - focus on how to manage heavy rains
        - big storage tanks of rain water (used for toilet flush, etc.)

        - green roofs → cooling & biodiversity
    - a building for bicycles
        - high priority for biking facilities
        - parking outside and inside, path through the building
    - contribution to the city
        - public canteen & café
        - campus park (native trees + grasses as well as more tropical ones)
- www.e-pages.dk/ku/1357/
- www.greencampus.ku.dk
- Challenges:
    - get ventilation & energy system to work
    - goal: need only ⅔ of energy of a similar lab space
    - project manager was strong driver and keen to reach sustainability goals → key ambassadors are important to have onboard
- A few old buildings had to be abandoned for this, but an increase of students, teachers & conducted research could be identified
- Labs are more complicated than other building plannings → tech isn't always the answer to sustainability, also design solutions could be
- Is it adopted by the public? → It is used by students and locals for picnics, etc.
- Cost factor: 200 Mio. €