



Lessons learnt from a regional workshop to develop a transformational plan for the built and urban environment to meet the UNSDGs in 2030

Downloaded from: <https://research.chalmers.se>, 2024-08-17 07:25 UTC

Citation for the original published paper (version of record):

Wallbaum, H., Fudge, C., Hagy, S. (2024). Lessons learnt from a regional workshop to develop a transformational plan for the built and urban environment to meet the UNSDGs in 2030. IOP Conference Series: Earth and Environmental Science, 1363(1). <http://dx.doi.org/10.1088/1755-1315/1363/1/012011>

N.B. When citing this work, cite the original published paper.

PAPER • OPEN ACCESS

Lessons learnt from a regional workshop to develop a transformational plan for the built and urban environment to meet the UNSDGs in 2030

To cite this article: H Wallbaum *et al* 2024 *IOP Conf. Ser.: Earth Environ. Sci.* **1363** 012011

View the [article online](#) for updates and enhancements.

You may also like

- [Physicochemical Analysis of Spent Hen Chicken Sausages with Jelly Mushroom \(*Auricularia auricula*\) Powder Inclusion as a Substitute for Sodium Tripolyphosphate](#)
M M Dewi, F H Barido, Puruhita *et al.*
- [Towards Positive Energy Districts: Multi-criteria framework and Quality Assurance](#)
E Malakhatka, D Wästberg, H Wallbaum *et al.*
- [Comparison of 16 national methods in the life cycle assessment of carbon storage in wood products in a reference building](#)
C M Ouellet-Plamondon, M Balouktsi, L Delem *et al.*

PRIME
PACIFIC RIM MEETING
ON ELECTROCHEMICAL
AND SOLID STATE SCIENCE

HONOLULU, HI
October 6-11, 2024

Joint International Meeting of
The Electrochemical Society of Japan
(ECSJ)
The Korean Electrochemical Society
(KECS)
The Electrochemical Society (ECS)

Early Registration Deadline:
September 3, 2024

**MAKE YOUR PLANS
NOW!**

Lessons learnt from a regional workshop to develop a transformational plan for the built and urban environment to meet the UNSDGs in 2030

H Wallbaum^{1*}, C Fudge² and S Hagy¹

¹ Department of Architecture and Civil Engineering, Chalmers University of Technology, 41296 Gothenburg, Sweden

² College of Design and Social Context, Royal Melbourne Institute of Technology, Melbourne, Victoria, 3001, Australia

*Corresponding author: wallbaum@chalmers.se

Abstract. Urgent transformational change and action within the built environment is needed as it accounts for a large proportion of CO₂ emissions and is rapidly growing. A partnership with UN Habitat and Mistra, the Swedish foundation for strategic environmental research, was established to lead a high-level expert workshop for Northwest Europe to develop transformative roadmaps to lead us from current practice to a built and urban environment scenario where the 2030 UNSDGs are achieved. The workshop, aiming to act as a pilot for similar workshops to be held in other parts of the world, was organized around four worksheet sessions that guided the participants through a co-creative process to share and draw on their expertise generating and iteratively narrowing down ideas to actions. The workshop was held over 2 days with 30 participants from various countries and disciplines engaged in the built environment. A wide range of topics was identified to be focused on for action, however, 6 key themes were agreed upon as priorities: Renovation and adaptive reuse, Process and methods, Social sustainability, Nature and biodiversity, Infrastructure, and Sustainable livelihoods. The work towards realizing sustainable cities and buildings is ongoing and the pilot workshop is one step towards building collaborative capacity and facilitating regional, context-based action towards a sustainable transformation of the built environment.

1. Introduction

The built environment has a significant environmental footprint. It accounts for over 34 per cent of energy demand and around 37 per cent of energy and process-related CO₂ emissions in 2021 [1]). There are roughly 255 billion sq. m of buildings in the world – a number that grows by around 5.5 billion sq. m every year [2] which is an equivalent of building New York City again every month. The need for action on the existing stock and any new stock grows ever more urgent. The built environment is a system and the transition to a fair and sustainable built environment can be brought about through collaborative and strategic system-wide analysis and action.

Given the need for transformational change in the built and urban environment [3] there are a few questions that can be used as a guide in relation to research and practice agendas. These include: How transitions can be accelerated, and which policy tools might influence the process positively? How to encourage the decline of existing non sustainable systems? How best to use the agency of actors involved in transition processes? How to move beyond ‘islands of innovation’ and achieve scale? How to manage uneven dimensions of transition through geography, culture, economy, and



stages of development? [4]. A project was initiated to begin to answer these deep and complex questions.

As part of this larger project, a partnership with UN Habitat and Mistra - The Swedish foundation for strategic environmental research supports research of strategic importance for a good living environment and sustainable development was established in order to lead a high-level expert pilot workshop for Northwest Europe to explore the development of transformative roadmaps to lead us from our current practice to the required built and urban environment 2030 scenario with the UNSDGs [5] achieved.

2. The high-level expert workshop

This workshop took place at Chalmersska huset in Gothenburg, Sweden on January 16-18, 2023, focusing on the region of Northern-Western Europe (NWE), and aims to act as a pilot for similar workshops to be held in other parts of the world. The workshop was held over 2 days and the 30 participants (all C-level representatives), from various countries and disciplines (public authorities, academia, business, NGOs) engaged in the built environment, were arranged into 5 groups of between 4-6 people each. The group members first brainstormed individually and then were tasked in groups to, develop, map, and establish what the built and urban environment would be like in Northwest Europe in 2030. The findings were shared and discussed in the whole group drawing also on a background paper circulated to all participants before the workshop.

The programme focused on:

- Developing an understanding (a scenario) of what the built and urban environment would be like if the UN SDGs were met in 2030.
- Examining where policy and practice are today in NWE and what the journey looks like from now until the 2030 scenario.
- Building an implementation strategy and measures for change and transformation for policy and practice from a position that currently is way behind what is required by 2030.
- Making sense of the findings, developing strategies to overcome barriers to transformation and focusing on the key messages to the main actors involved in change and transformation in the built environment.

3. Methodology and process

The workshop was organized around four worksheets (see Figure 1) and sessions that aimed to guide the participants through a co-creative process to share and draw on their various expertise to generate ideas and iteratively narrow down the ideas to concrete actions. Following is a brief overview of the process, as well as a sequence of sheets chosen to exemplify the process (see Figure 2). During analysis, this sequence of exemplary sheets shown in Figure 2 were identified as belonging to the characteristic “New build as second choice and if chosen must be zero carbon”, which was then sorted into the cluster “Renovation and adaptive reuse”.

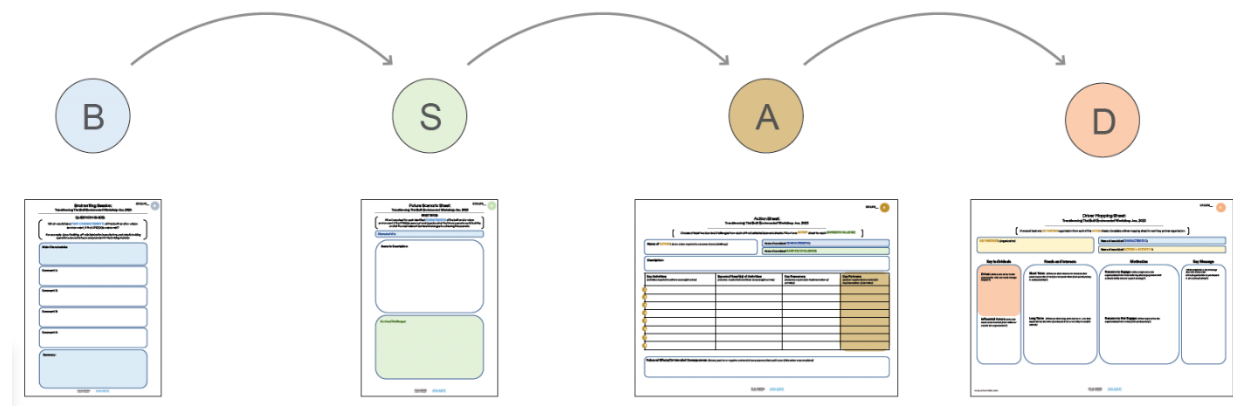


Figure 1. Worksheet overview (B-brainwriting, S-future scenarios, A-action mapping, D-driver mapping).

The workshop process and findings will be described using specific terminology. Table 1 defines these terms.

Table 1. Definitions of terms.

| | |
|------------------------------------|--|
| Process steps | B - Brainwriting, S - Future Scenarios, A - Action mapping and D - Driver mapping |
| Sheets | The filled-in templates were given to the workshop participants. The workshop generated 89 sheets in total, spread across the four process steps. |
| Characteristics | Each sheet was identified as treating or belonging to a certain characteristic of the future built environment. The characteristics are assigned to sheets across all process steps and are descriptive in nature. |
| Clusters of characteristics | When possible, similar characteristics were combined into “clusters”, indicating a more overarching thematic similarity between characteristics. |
| ‘Most mentioned’ clusters | Out of all 16 clusters of characteristics, 6 could be identified as “most mentioned”, based on their total amount of sheets; they all include more than 6 total sheets each. |

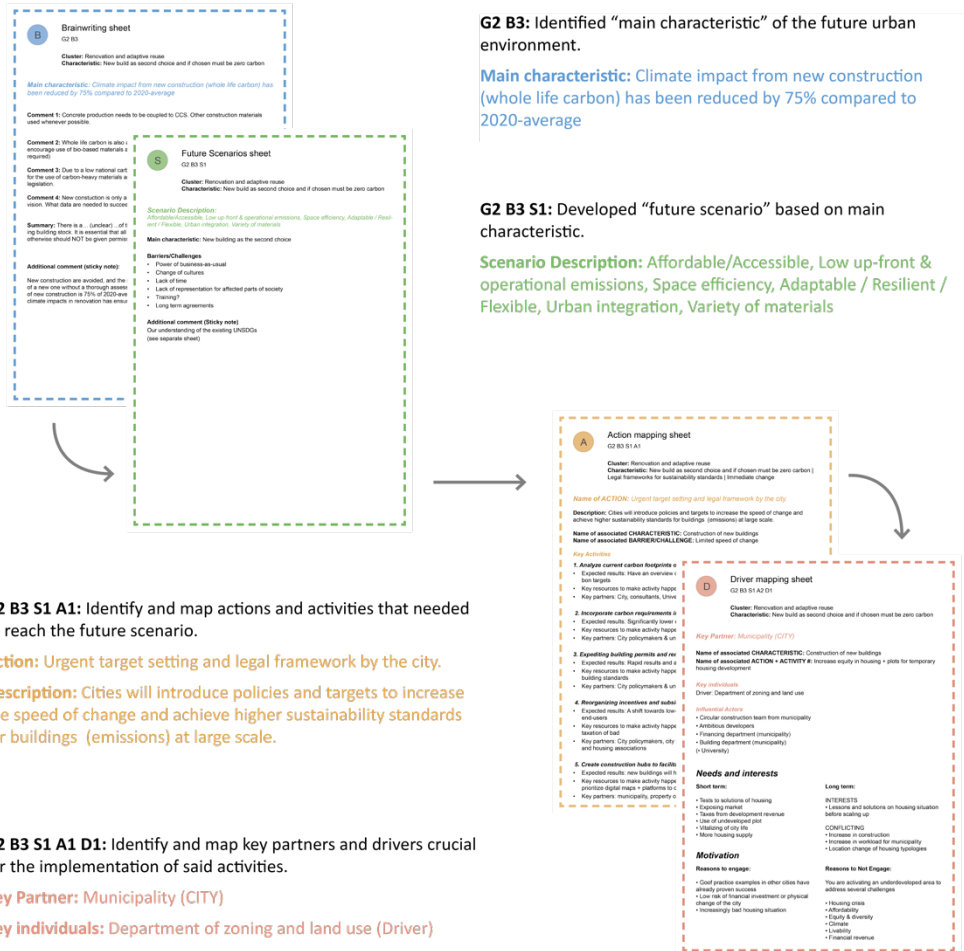


Figure 2. Example of a select sequence of worksheets.

3.1 Brainwriting

The first step in the process was a brainwriting exercise. Each group member received a sheet with the following prompt: What would be a MAIN CHARACTERISTIC of the built and/or urban environment, if the UNSDGs were met? One minute was given for each group member to simultaneously answer the aforementioned question, then each of the group members passed their paper to another and comment on the others’ initial answer to compliment or deepen the characteristic. This process repeated till all group members had commented on all sheets and received their original sheet back, where it was summarized by the original author. Each group created one brainwriting sheet per group member, i.e., 5-6 sheets per group.

B Brainwriting sheet
G2 B3

Cluster: Renovation and adaptive reuse
Characteristic: New build as second choice and if chosen must be zero carbon

Main characteristic: Climate impact from new construction (whole life carbon) has been reduced by 75% compared to 2020-average

Comment 1: Concrete production needs to be coupled to CCS. Other construction materials used whenever possible.

Comment 2: Whole life carbon is also applied to renovation. Legislation will have changed to encourage use of bio-based materials and low-carbon conventional materials (where their use is required)

Comment 3: Due to a low national carbon budget, up-front carbon does in most cases not allow for the use of carbon-heavy materials and LCAs regulate the use of the word "sustainability" in legislation.

Comment 4: New construction is only a small part of the built environment. Also: carbon tunnel vision. What data are needed to succeed? Knowledge?

Summary: There is a... (unclear) ...of the future scale + volume of new build and retrofit of existing building stock. It is essential that all new build has to be exceptional in relation to performance otherwise should NOT be given permission.

Additional comment (sticky note):

New construction are avoided, and the space is optimized. No building is demolished in a favor of a new one without a thorough assessment of the possibility to preserve. The climate impact of new construction is 75% of 2020-average, and with focus on upfront emissions. Regulation of climate impacts in renovation has ensured climate-smart retrofit/renovation.

Figure 3. Example of transcribed brainwriting sheet.

3.2 Future scenarios

The participants were then asked to fill out one future scenario sheet for each identified characteristic that was identified in the brainwriting session. The groups worked together to create scenario sheets from each of the identified characteristics. Each scenario sheet aimed to paint the picture of a future where the respective characteristics had been realized. The groups were also asked to identify barriers/challenges that are currently keeping that scenario from being realized. Each group created between 3-5 future scenario sheets.

S Future Scenarios sheet
G2 B3 S1

Cluster: Renovation and adaptive reuse
Characteristic: New build as second choice and if chosen must be zero carbon

Scenario Description:
Affordable/Accessible, Low up-front & operational emissions, Space efficiency, Adaptable / Resilient / Flexible, Urban integration, Variety of materials

Main characteristic: New building as the second choice

Barriers/Challenges

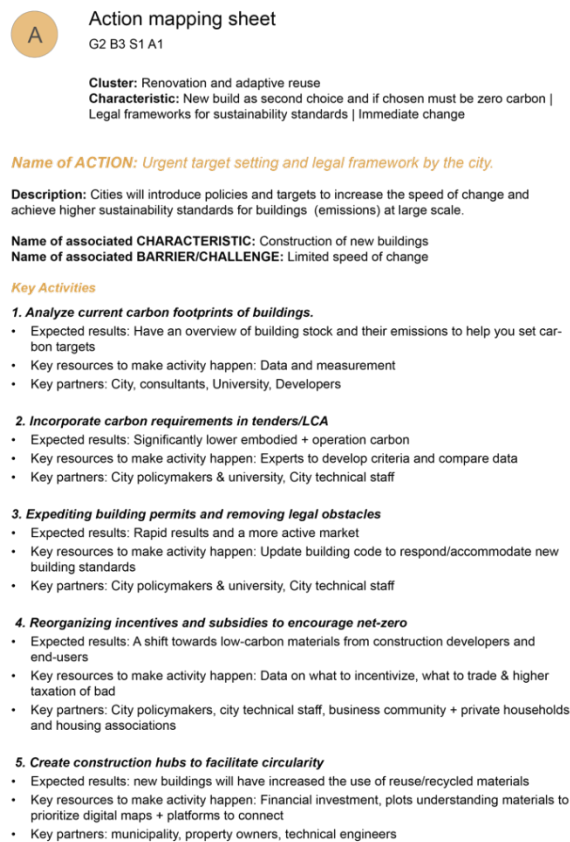
- Power of business-as-usual
- Change of cultures
- Lack of time
- Lack of representation for affected parts of society
- Training?
- Long term agreements

Additional comment (Sticky note)
Our understanding of the existing UNSDGs
(see separate sheet)

Figure 4. Example of transcribed future scenario sheet.

3.3 Action mapping

In this step participants were asked to choose at least two barriers/challenges from each of future scenario sheets and fill out one action sheet for each barrier/challenge. The groups worked together to create actions, each with 8 associated (sub) activities, that could make that action happen. The participants also identified key partners that would need to be involved to complete the activities. This step was quite time consuming, so each group ended up creating an average of 2-3 action sheets.



A Action mapping sheet
G2 B3 S1 A1

Cluster: Renovation and adaptive reuse
Characteristic: New build as second choice and if chosen must be zero carbon | Legal frameworks for sustainability standards | Immediate change

Name of ACTION: *Urgent target setting and legal framework by the city.*

Description: Cities will introduce policies and targets to increase the speed of change and achieve higher sustainability standards for buildings (emissions) at large scale.

Name of associated CHARACTERISTIC: Construction of new buildings
Name of associated BARRIER/CHALLENGE: Limited speed of change

Key Activities

- Analyze current carbon footprints of buildings.**
 - Expected results: Have an overview of building stock and their emissions to help you set carbon targets
 - Key resources to make activity happen: Data and measurement
 - Key partners: City, consultants, University, Developers
- Incorporate carbon requirements in tenders/LCA**
 - Expected results: Significantly lower embodied + operation carbon
 - Key resources to make activity happen: Experts to develop criteria and compare data
 - Key partners: City policymakers & university, City technical staff
- Expediting building permits and removing legal obstacles**
 - Expected results: Rapid results and a more active market
 - Key resources to make activity happen: Update building code to respond/accommodate new building standards
 - Key partners: City policymakers & university, City technical staff
- Reorganizing incentives and subsidies to encourage net-zero**
 - Expected results: A shift towards low-carbon materials from construction developers and end-users
 - Key resources to make activity happen: Data on what to incentivize, what to trade & higher taxation of bad
 - Key partners: City policymakers, city technical staff, business community + private households and housing associations
- Create construction hubs to facilitate circularity**
 - Expected results: new buildings will have increased the use of reuse/recycled materials
 - Key resources to make activity happen: Financial investment, plots understanding materials to prioritize digital maps + platforms to connect
 - Key partners: municipality, property owners, technical engineers

Figure 5. Example of transcribed action mapping sheet.

3.4 Driver mapping

The final step of the workshop was for each group to choose at least one key partner organisation from each of the action sheets and complete a driver mapping sheet for each key partner organisation. For each of the actions/activities, the groups worked together to identify key drivers, i.e. organisations, businesses or individuals that would be essential for the realisation of that specific action. Each group generated between 1-3 driver mapping sheets.

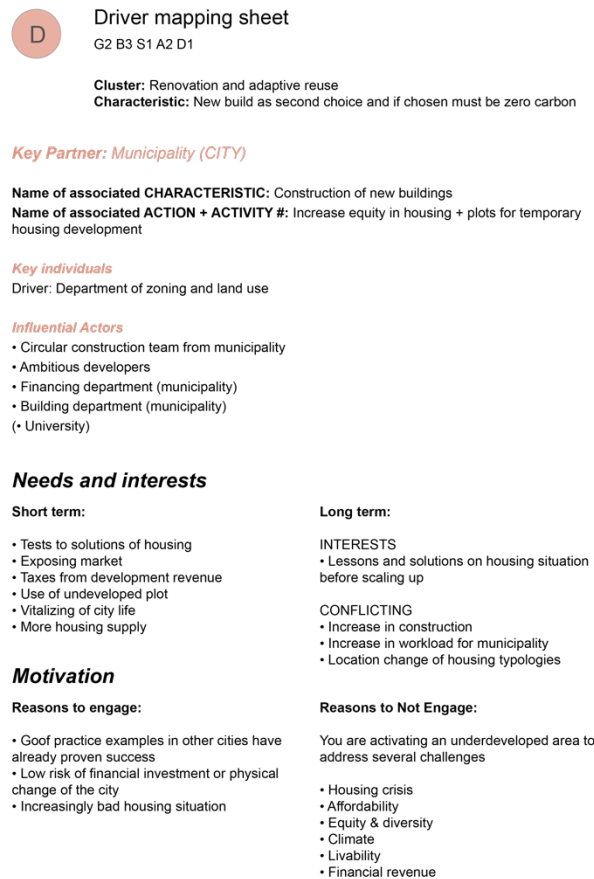


Figure 6. Example of transcribed driver mapping sheet.

4. Results

The five working groups developed a wide array of ideas spread across a total of 89 sheets; 24 Brainwriting, 30 Future scenarios, 25 Action mappings and 7 Driver mappings. After transcribing the worksheets and materials from the workshop it was found that each group created an average of 15-20 sheets across the two days, including 4-5 Brainwritings, 5-7 Future scenarios, 4-5 Action mappings and 1-3 Driver mappings. Figure 7 illustrates this process and the generated material.

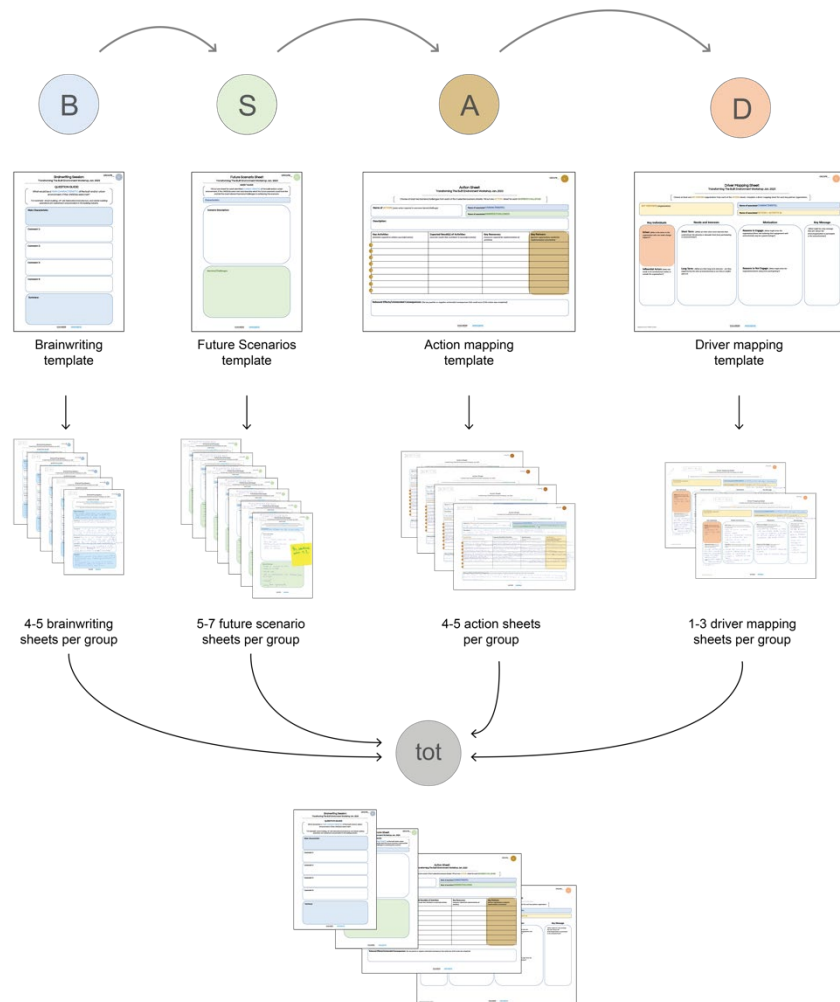


Figure 7. Workshop material flow.

Each of the generated sheets could be identified as tackling a certain characteristic, or theme, of the urban environment in 2030. Upon analysis, these characteristics could be combined into a total of 16 overarching clusters, each containing one or more of the originally identified characteristics. Figure 8 below shows the distribution of the 16 clusters, in terms of how many sheets were grouped into each cluster.

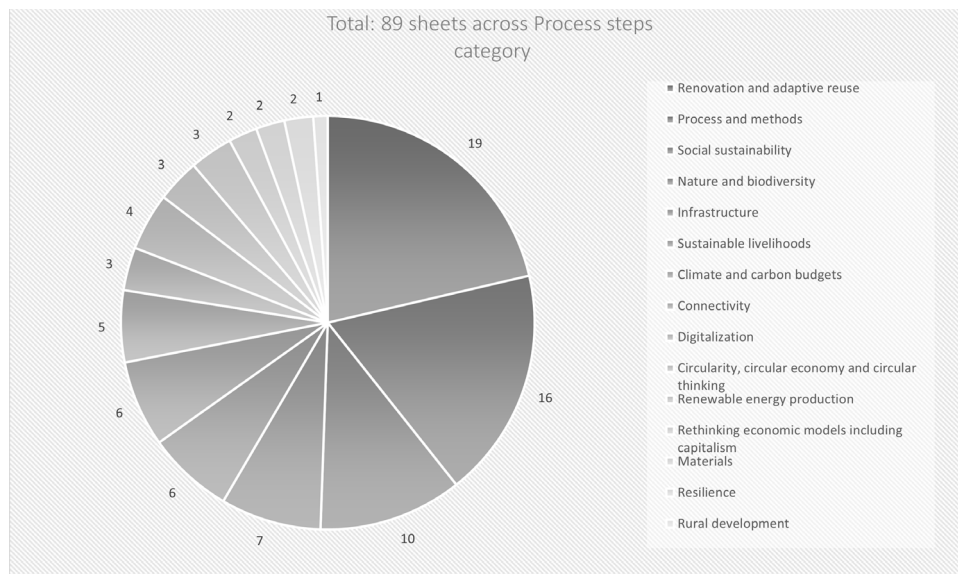


Figure 8. Total number of sheets per cluster.

After further analysis of the 16 clusters, 6 ‘most mentioned’ clusters of characteristics were identified (see Table 3), which would be apparent if the UN SDGs were met by 2030:

- Renovation and adaptive reuse (19 sheets in total)
- Process and methods (15 sheets in total)
- Social sustainability (10 sheets in total)
- Nature and biodiversity (7 sheets in total)
- Infrastructure (6 sheets in total)
- Sustainable livelihoods (6 sheets in total)

Table 2. Detailed description of 6 most mentioned clusters of characteristics.

| Most mentioned clusters of characteristics | Characteristics addressed |
|--|---|
| Renovation and adaptive reuse | retrofitting as a priority over new build, renovation and retrofitting of all types of existing building stock, new build as second choice and if chosen must be zero carbon |
| Process and methods | co-design, immediate change, system thinking, cross party collaboration and trans disciplinarity, post humanistic design |
| Social sustainability | achieve social sustainability across towns and cities, leave no-one behind, social inclusion built into neighbourhoods and towns and cities as a whole, self- management, trust, habits, equity as a guiding principle for policy, transparent, inclusive and accountable governance systems, rethink ownership |
| Nature and biodiversity | rewilding cities and countryside, thinking inclusively about all of life and beyond just humans, integrated green infrastructure, designing green infrastructure-buildings, public space whole of public realm |
| Infrastructure | transportation infrastructure including electric charging networks, sewerage systems including renewal and rethinking (separation and reuse) |
| Sustainable livelihoods | sharing, hiring, and repairing economy, education, training and retraining at all levels, expansion of new forms of economic futures |

In addition to these ‘most mentioned’ characteristics, the participants also made contributions relating to a wider range of characteristics, which were clustered as shown in Table 3 below.

Table 3. Detailed description of 10 remaining clusters of characteristics.

| Cluster of characteristics | Characteristics addressed |
|--|---|
| Renewable energy production | affordable and equitable energy provision from renewable sources, development of solar settlements, neighbourhoods and cities, development of energy feedback systems |
| Circularity | circular economy, circular thinking |
| Materials | renewable materials, understanding of origins and use of existing and new materials, expansion and upscaling of use of re-used materials |
| Digitalisation | use of digital technology advances and innovations, development of sophisticated smart buildings, neighbourhoods, towns and cities |
| Air pollution | introduction of low emission zones in cities (see impact in London and Bristol re WHO levels), low emission zones and delivery of UN SDGs |
| Rethinking economic models including capitalism | new economic models, rethinking taxation, introducing economic incentives for change and transformation, introducing new business models |
| Rural development | rethink urban rural continuum, rethink food production and consider local food production innovations |
| Climate and carbon budgets | climate, carbon budgets |
| Resilience | resilient buildings |
| Connectivity | compact and connected urban systems and functions |

When comparing the 6 ‘most mentioned’ clusters, they each contain a varying number of sheets from the 4 steps (see Figure 9); some contain more action sheets (such as the cluster ‘Renovation and reuse’) while others contain more future scenarios (such as ‘Social sustainability’).

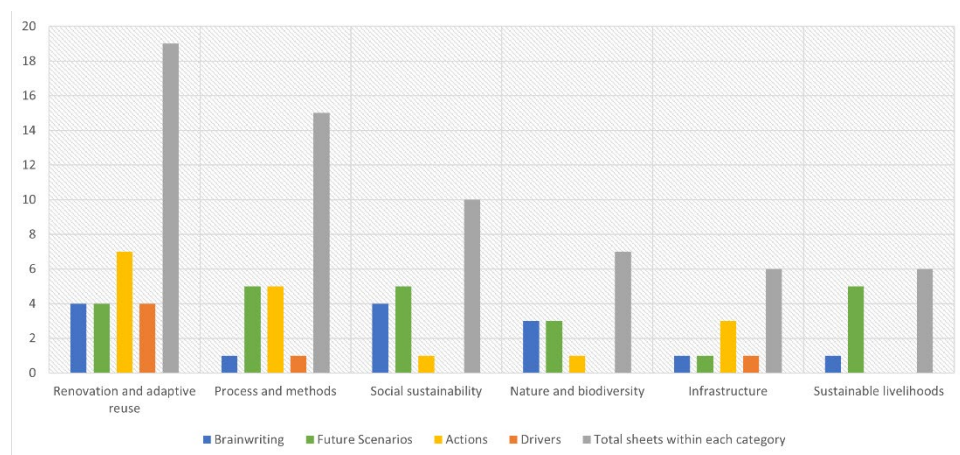


Figure 9. Distribution of sheets across process steps within most mentioned clusters.

Figure 10 to Figure 13 illustrate this difference, indicating the various ‘most-mentioned’ clusters of characteristics that were created in each of the 4 process steps.

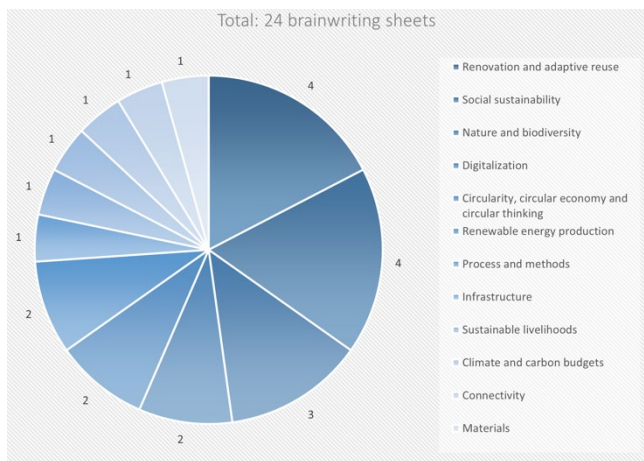


Figure 10. Most mentioned characteristics within future scenarios sheets.

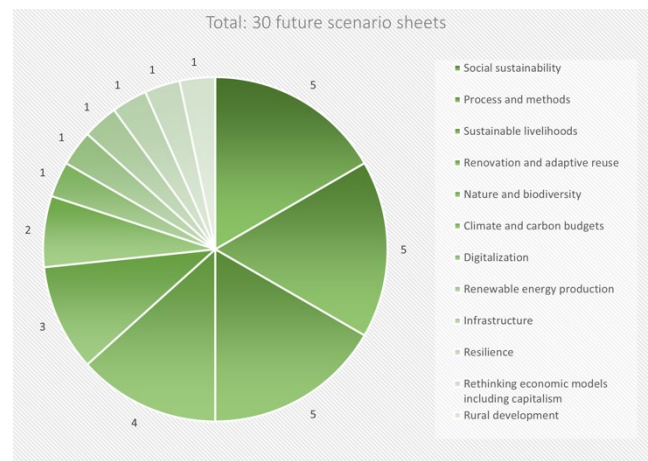


Figure 11. Most mentioned characteristics within action mapping sheets.

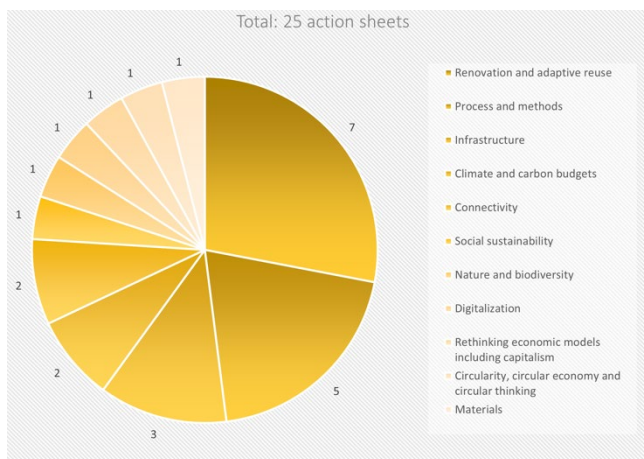


Figure 12. Most mentioned characteristics within action mapping sheets.

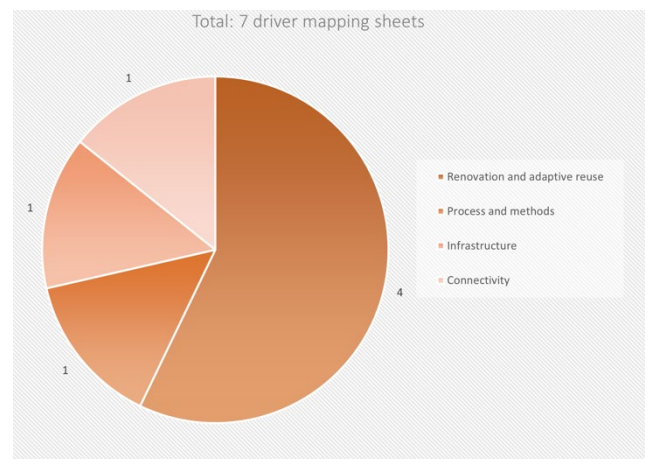


Figure 13. Most mentioned characteristics within driver mapping sheets.

5. Discussion

The expert workshop for Northwest Europe was the first of a number of workshops that are considered to take place in different regions of the world over the next two years. This workshop led by Chalmers University in partnership with UN Habitat and Mistra was a pilot workshop for the whole series and in that sense was experimental and the results, in terms of content and process are important in themselves for Northwest Europe, but also for learning and evaluation and suggestions for the ‘retuning’ of the remaining workshops to follow.

The learnings from the workshop were manifold and could be summarised as follows:

- The complexity of the transformation of the built and urban environment to meet the UNSDGs needs considerable discussion and unpacking even with experts and may be this suggests that there should be more information provided in advance of the workshop and/or that each participant completed a personal experience survey that could be shared with other participants.
- Participants mixed orientation and backgrounds provided a rich base for discussion however there were differences in their orientations in relation to policy thinking and strategy and more practice-based actions and implementable solutions. It may be necessary to recognise that each group needs this mix but also needs more help with facilitation and recording.
- The discussions at the end of Step 1- the characteristics of the built and urban environment that would meet the UN SDGs by 2030 – could have been extended further so that the issues being

addressed in the rest of the workshop formed a wider base. This would mean that the facilitators introduced other characteristics that were either omitted or not prioritised.

- Similarly, it may have been useful for a wider discussion around where we are today in relation to the SDGs so that it was clearer for all participants of the challenge, urgency, and requirements to be able to implement a transformational change at scale, at speed and by 2030.
- The means of recording the group's findings during the workshop were adequate and simple in relation to pre-printed worksheets and pens and stickies but meant that the translation of this material at the end of the workshop was somewhat difficult and it could be that utilising digital recording for each group would have been easier for presentations and as a long-term record of the workshop.
- One of the intentions was to end up with a clear understanding of the key messages for different stakeholders, however there was not enough time to satisfactorily address this issue, and this needs further thought and reflection.
- The external facilitation/guidance to ensure participants remain focused on problem solving and delivery and the balance of using the participants own understanding of direction should be considered to enrich the conversations.
- More space and time may be needed to bring the key issues to some form of conclusion and to discuss the broader issues that might include: How the societal transformational approach can be achieved? How to scale up? How to speed up? How to communicate successful practice? How to build a route map? How to overcome barriers?

There was very wide coverage of many topics or themes from the workshop participants however there were a number of key priorities that were agreed by a large percentage of the participants. These included:

- Renovation and adaptive reuse (19 sheets in total)
- Process and methods (15 sheets in total)
- Social sustainability (10 sheets in total)
- Nature and biodiversity (7 sheets in total)
- Infrastructure (6 sheets in total)
- Sustainable livelihoods (6 sheets in total)

There were also many other themes of significance that other groups may have prioritised more strongly and considerable learning and tuning in relation to this pilot workshop process that will be taken into the design of the remaining workshops. There is also a need/plan to integrate the findings from the pilot workshop into a wider programme of research and action that would include the following:

- Rethinking approaches to processes and methods in relation to buildings and urban development
- Rethinking approach to adaptive reuse, renovation, and recycling as a priority over new build
- Proposing that in policy terms all new build is zero carbon as built and in use
- Rethinking approach to development to ensure that social sustainability has equal status to environmental and economic
- Rethinking approach to urban planning, urban design and the design of buildings or adaptive reuse of buildings address the two interrelated issues of climate change and biodiversity.
- Ensuring that future energy production for adaptive reuse and new build is from renewable sources and that storage is considered within this approach.
- Rethinking the professional education of key actors at undergraduate, postgraduate and craft/technical levels as well as the retraining of existing practitioners.
- Rethinking the roles and responsibilities of the 'client' in all aspects of development.

6. Conclusion and Future Outlook

In conclusion, the work to develop research paradigms and regenerative thinking to include systems analysis, quantitative and qualitative research, policy, and governance analysis, understanding societal change, circularity, low and zero carbon futures, urban futures, healthy cities, design for nature and landscape, sustainable cities and buildings is ongoing and this pilot workshop is one step towards building capacity in collaboration with others and facilitating regional, context-based action towards a sustainable transformation of the built environment.

Based on the lessons learnt, the workshop sheets have been revised to make them even more understandable and targeted for future workshops in other regions. Further workshops are currently planned, especially in Africa, as part of the World Urban Forum in Cairo. We also hope that other regions will come forward to organize workshops there too. All documents, including the workshop concept, are open source and will be made available by the authors if the respective workshop results are also shared as open source.

References

- [1] United Nations Environment Programme (2022). 2022 Global Status Report for Buildings and Construction: Towards a Zero-emission, Efficient and Resilient Buildings and Construction Sector. Nairobi.
- [2] RIBA (2021), Built for the environment report. <https://riba-prd-assets.azureedge.net/-/media/GatherContent/Business-Benchmarking/Additional-Documents/Built-for-the-Environment-reportpdf.pdf?rev=91389284dcb64a638f1089b81931343f> (accessed April 21, 2023).
- [3] Fudge C, Grant M, Wallbaum H. Transforming cities and health: Policy, action, and meaning. *Cities & health*. 2020 May 3; **4** (2):135-51.
- [4] Lorch R. Climate policies for buildings. *Building Research & Information*. 2017 Jul 4; **45** (5):475-7.
- [5] United Nations Department of Economic and Social Affairs (UNESA) (2023). <https://sdgs.un.org/goals> (accessed 2024-01-01).