

# Graduation Plan

Master of Science Architecture, Urbanism & Building Sciences



## Graduation Plan: All tracks

Submit your Graduation Plan to the Board of Examiners ([Examencommissie-BK@tudelft.nl](mailto:Examencommissie-BK@tudelft.nl)), Mentors and Delegate of the Board of Examiners one week before P2 at the latest.

The graduation plan consists of at least the following data/segments:

Personal information	
Name	Sanjana Maria John
Student number	5546745

Studio		
Name / Theme	User Perspective	
Main mentor	Alexandra Den Heijer	MBE- REM
Second mentor	Michaël Peeters	MBE- REM
Argumentation of choice of the studio	During the first year of the MBE masters, I found the course Real estate management very fascinating and wanted to pursue it in some form for my thesis. Furthermore, within REM, I found the topic of hybrid working particularly interesting, especially since it is a very new phenomenon and hence quite dynamic. Hybrid working has impacts at different levels of a workspace- functional, financial, environmental, and strategic and my thesis attempts to understand these relations. The theme of User Perspective was best aligned with since it encouraged us to view a topic from multiple perspectives.	

Graduation project	
Title of the graduation project	Reconfiguring workspace configurations for a sustainable future- Understanding the links between new working trends and the sustainability of workspaces in a post pandemic reality.
Goal	
Location:	The Netherlands
The posed problem,	<p>The International Panel on Climate Change (IPCC) report (2022) reveals that emissions are at the highest level in human history and must reduce by 43% by 2030 if we are to stay under the 1.5°C rise threshold. While governments world over are setting plans in to motion to move to a net zero economy, real estate needs to make bolder and urgent moves.</p> <p>Office real estate plays a crucial role in the path to a sustainable future (Zhang et al., 2022) as energy use in office buildings has considerably risen in recent years due to expanding office spaces and increasing building utilisation. Improving energy efficiency would lead to decreased CO2 emissions (Worrell et al., 2001) lowering office</p>

	<p>buildings’ carbon footprint and, therefore, counteracting climate change.</p> <p>The sector can not only bring about change through reimagining the built environment, but it can also have a positive impact on health and wellbeing of employees. This is even more relevant since employees today are motivated to work for companies that promote a sustainable lifestyle for its employees but also contributes to a more healthy, sustainable community (JLL, 2022).</p> <p>It is hence critical that corporates <b>anticipate change</b> and ensure their portfolios are <b>future-proofed</b> to mitigate the risk of asset stranding.</p> <p>Historically, the office has been a congregation space where people gather to do one job primarily- work. However, after the pandemic, the office changed drastically, as work has also extended to the personal confines of one’s home and hybrid working has been more commonplace.</p> <p>Despite these changes, De Paoli &amp; Ropo (2015) emphasise that offices remain central to workspace functions but need to be re-configured. Mantesi et al’s (2022) study indicates that office use and performance is intrinsically linked to occupancy patterns and this newly emerging blended working strategy is bound to have major impacts at a building and portfolio level.</p> <p>However, recent studies on hybrid working are increasingly focused on employee performance and productivity, while side-lining its impacts on the energy performance of space. This thesis therefore attempts to study the link between hybrid working processes, its impact on workspace environment and its role in the transition to a sustainable future.</p>
<p>research questions and</p>	<p><b>Main RQ:</b> How is the energy performance of the workspace environment impacted by hybrid modes of working?</p> <p>To answer this research, the following research sub-questions are anticipated:</p> <ul style="list-style-type: none"> <li>• <b>SQ1:</b> What is hybrid working?</li> <li>• <b>SQ2:</b> How has the definition of a ‘workspace’ evolved due to hybrid working?</li> <li>• <b>SQ3:</b> How has hybrid working impacted the use office space?</li> <li>• <b>SQ4:</b> How is the energy footprint of a user impacted by the dynamic occupancy that results from hybrid working?</li> </ul>

design assignment in which these result.	<ul style="list-style-type: none"> <li>• Quantitatively evaluate the impact of hybrid working on the energy performance of workspaces.</li> <li>• Create a systematic mapping of the different impact areas of hybrid working using Den Heijer's (2021) four perspective scheme, to enable a visualization of the interdependencies between the main parameters.</li> <li>• Translate the results and mapping into practical insights for CRE managers, business owners and end users and enable a more conscious understanding and evaluation of their building assets by basing it on current working trends.</li> </ul>
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## Process

### Method description

The thesis will follow an inductive line of research, using a quantitative research design to establish links between hybrid working and the energy performance of workspaces.

It is organised into three phases:

The **first stage** of the data collection involves an in- depth literature review to answer SQ1 and SQ2 and form the theoretical basis for a system mapping of the different impact areas of hybrid working, establishing links and interdependencies between the main concepts. Furthermore, it also identifies the parameters that will be then measured during the data collection and analysis stage.

The **second stage** of the research will involve data collection from case studies to quantitatively measure energy footprint of workspaces and employees because of hybrid working. This will be used to answer SQ3 and SQ4.

The **third stage** involves synthesis and conclusion of the findings which feeds into the finalization of the system mapping. If time permits, an expert panel might be organised to confirm, validate, and reflect on the intermediate findings.

The above stages will be concluded to answer the main research question while also translating the results and mapping into practical insights for CRE managers, business owners and end users and enable a more conscious understanding and evaluation of their building assets by basing it on current working trends

### Literature and general practical references

The literature review had two purposes. The first was to gain knowledge on the topic of hybrid working from existing scientific publications. This helped establish the scope of impact of these current working processes. Furthermore, during the course of the literature review, the gap in literature between hybrid working and energy performance of space was noted. This led to the formulation of the main research

question. The review was supported to a larger extent by Halford 's (2005) and (Babapour Chafi et al's , 2021) study on teleworking, among many other sources.

The second objective of the literature review was to establish a theoretical basis for the system mapping of the relationship between workspace environments and energy performance when mediated by hybrid working. The different parameters linking these three concepts were arrived at through the explorative literature review. The research heavily relied on Halford's (2005) study of hybrid working and Hook et al's (2020) systematic review for identifying the different parameters while the system mapping was adapted from Den Heijer's (2021) four perspective scheme.

## Reflection

1. What is the relation between your graduation (project) topic, the studio topic (if applicable), your master track (A,U,BT,LA,MBE), and your master programme (MSc AUBS)?

The topic of this research relates to the theme studio of User Perspective as it studies the impacts of hybrid working on different stakeholders- business owners, CRE professionals and the end users of space. Furthermore, this thesis reference's the 4-perspective framework of Den Heijer (2021) and views hybrid working from the financial, functional strategic and environmental angle.

Its relationship with the MBE lies in its relation to the discipline of Real Estate Management (REM). The thesis attempts to understand the link between blended working processes and the energy performance of a building, in order to optimize the management and utilization of workspaces such that it benefits CRE professionals, business owners and end users.

It is related to the master programme MSc AUBS as it contributes to creating a more sustainably managed and future-proofed built environment.

2. What is the relevance of your graduation work in the larger social, professional and scientific framework.

**Societal relevance:** Office buildings reflect the times we live in and the people who occupy them (Gillen, 2019). As Duffy (2001:216) noted, *"the meaning of the working environment cannot be taken for granted in times of change, because the office is such a precise mirror of attitudes."* We are currently in a very transient period with workforces becoming more agile and office work becoming more collaborative. Increased digitization in recent years along with pandemic induced flexible working model are bound to affect both the design, occupancy patterns, operation of offices and consequently the human-building interaction (Mantese et al., 2022). This study aims at providing new information about a dynamic topic that is starting to be critical. While research into hybrid working has been picking up recently, this study attempts to offer a holistic understanding of hybrid working across multiple scales so that it can be valuable for built environment professionals as well as the end user of space.

The **scientific and professional relevance** of this subject lies in the fact that while the concept of remote working has been prevalent from the 1970's, the blended strategy of hybrid working is more recent and has completely overhauled work processes during the last four years. This thesis attempts to

address the gap found in the literature review between this new working process and its impact on the energy performance of the built environment.

Furthermore, COVID-19 is expected to affect how we use buildings in the post pandemic status quo, thereby changing our approach to the design of such buildings in the future. Given the increasing urgency of addressing climate change, it is important to study and understand this subject to be able to contribute solutions of value in the immediate future. The findings can benefit both corporate real estate managers and business professionals to achieve a more efficient and sustainable management of their building stock.

## References:

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