MANCHESTER SCHOOL OF ARCHITECTURE

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MANCHESTER 1824
The University of Manchester

Manchester Metropolitan University

Carbon Co-op

MSA LIVE 23

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Partners

Our Group had the privilege of collaborating with Carbon Co-op for MSA Live 2023. Carbon Co-op is an innovative company based in Manchester that assists individuals and communities in combating climate change through the implementation of substantial cuts to residential energy consumption. The co-op's almost 500 participants are encouraged to improve the energy efficiency of their homes and to pass along the lessons they've learned, and the ideas that have inspired them, to others.

Carbon Co-op was founded on the philosophy of 'people powered not fossil fueled' and acts as a facilitor, repository of knowledge, within communities around Manchester and beyond.

As a cooperative, it relies on the support of its members, many of whom advocate for a sustainable future. Many desire to do what they can to mitigate the effects of climate change in their local communities by setting an example through their own personal actions. Some of the members only have interest in Retrofit, some have already had a retrofit evaluation done (using something like Home Retrofit Planner), while others have done some work and intend to do more. Carbon Co-op provides numerous benefits to homeowners and communities alike. Carbon Co-op hosts webinars and events to educate the public, workshops on a variety of topics, and promotes member-to-member learning through their online discussion forum.

People Powered Retrofit, a partner organisation of Carbon Co-op, conducts energy audits and provides additional technical aid, including design support. They devote a great deal of time to packaging the members' acquired knowledge and experience for other homeowners and legislators in the government and worldwide.

Agenda

Retrofit Champions

We are in a global climate emergency.

As indicated by the UN, there is a widening gap between ambition and action. Furthermore, in the UN Global Status Report for Buildings and Construction published in 2022, the residential sector in 2021 was responsible for 21% of the global share of final energy demand. As stated by the London Energy Transformation Initiative (LETI), within their Climate Emergency Retrofit Guide, 80% of the homes that will exist in 2050 have already been built. Therefore, the focus of our collective efforts, to reduce global carbon emissions within the residential sector, should be dedicated to reducing the carbon footprint of our existing housing stock.

Fundamental to reduce our global greenhouse gas emissions, GHG, is the need to change our behaviours. The project, like much of Carbon Co-op's work, makes use of Community Based Social Marketing (CBSM) which is a proven method to foster sustainable behaviour change (McKenzie-Mohr et al., 2011).

A 'Retrofit' is not just about the building. It’s also about the people. This sentiment is shared in the effort to reduce our GHG - the construction and operational emissions need to be reduced but also the way that we live. Jonathan Atkinson, Carbon Co-op note that we are currently in the stage of the innovators. In order to bring this from the action of the few to the action of the many the project aims to utilise CBSM in order to promote this change.

By creating feature articles, the positive actions undertaken by the retrofit champions are made visible to a much larger audience, through social diffusion, helping retrofit to become a social norm. As exposure to retrofit increases, neighbours and fellow homeowners are more likely to act.

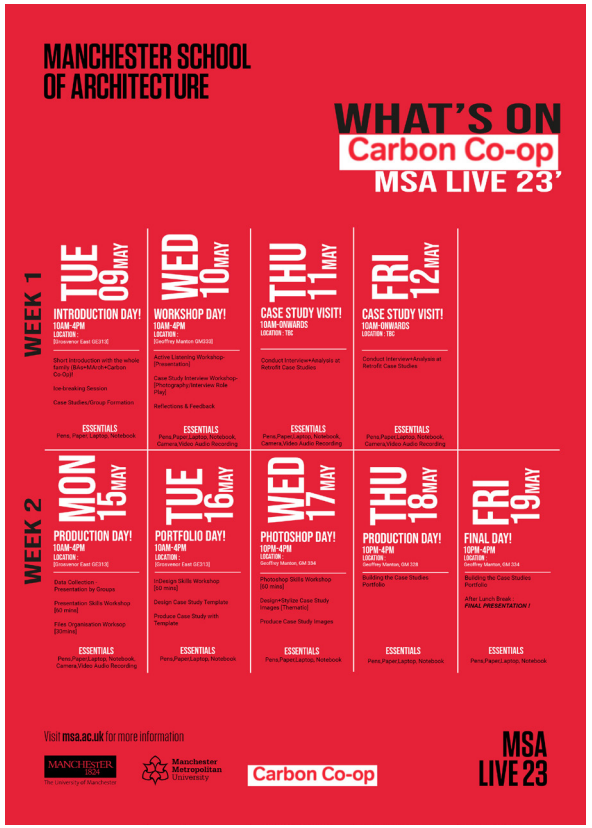
Showcasing the work of the vanguard of retrofit, those who have shown that it is possible, will help retrofit become adopted more widely, close the gap between climate ambition and action.

This is the story of Manchester's retrofit champions.

Action Plan

Our initial meeting with Carbon Co-op (CC) in late 2022 outlined the desirability of a festival of retrofit to educate the general public about the benefits of sustainable building design and construction/ renovation. Carly and Marlo, who introduced us to the CC, gave a short presentation about the company and different retrofitting approaches taken by CC before outlining the brief to inspire people to retrofit and get in touch with repositories of retrofit knowledge and experience such as CC, People Powered Retrofit (PPR) and Urbed etc.

As the weeks went by and we discussed what a festival of retrofit would entail, we were informed of organisational changes to CC and awaited news of the status of the given brief and the desired outputs from our collaborators. We notified our MSA Live supervisors about the changes and monitored the situation. After things had settled with our collaborator, John Atkinson, who splits his time between CC and PPR as director, informed us of the restructuring and a new brief. Before outlining such, he presented some case studies to us via a Teams meeting and shared resources relating to case studies from the company. The research element of these case studies would form the basis of our new brief, focusing on retrofit and change, as well as the process from the occupants' perspectives, post completion and occupancy



The new brief reframed our focus towards the champions of retrofit in the local area (the North West), and what decisions drove them towards retrofitting and the process they encountered. We had a keen interest in understanding sustainable construction and design from a clients point of view, or through analysing the variance in approaches, materials and techniques to suit different needs and constraints. Though less hands on than the festival brief, the new tasks would offer us a more real understanding of what retrofitting entails given real-world constraints.

We then created some draft poster designs between us that would be sent over to BA students to help inform their choices for the MSA groups. The drafts varied based on themes, some focused on the act of retrofitting and construction, others on measuring thermal efficiency. The chosen theme centred around the case study examples presented by Johnathan in our initial meeting with him, focusing on the example set by local pioneers in retrofitting.

Streamlining the action weeks and the tasks that needed to be completed was achieved through mapping out the key dates for deadlines and meetings. We made sure to have bi-weekly meetings to discuss our progress, making notes of what was discussed as a way to record trajectory and improvements.

A key output, ensuring the protection of our research participants, was the ethics application. This detailed the interview process as well as the information relating to the key outputs of the research and ideal timings. We had to ensure that participant were aware of how their personal information would be used and their personal information rights. To this end, a consent form was provided and signed by participants, affirming their recognition of the scope for usage of the information they provided. We remained open to changing and redacting information where practical if concerns were raised by interviewees.

The risks identified for the action week were related to travelling to site and rushing, mixed with slips trips and falls as an umbrella risk. Each risk had a risk factor and impact factor that would be multiplied to give an overall score. The higher the score, the greater the risk. Using measures such as setting of early, not rushing, wearing appropriate footwear etc., risk scores were reduced.

The action plan that we produced prior to the start of the MSA live weeks was similar in style to a teaching plan. In this document, an hour by hour breakdown of what would be taught to students detailed the required materials, locations, teaching methods, individuals presenting etc. Beyond sessions centred around the conducting of interviews and analysis of findings, additional sessions would also be given relating to design skills, listening, photography etc., to help BA students in their studio work as they continued their studies. Case studies

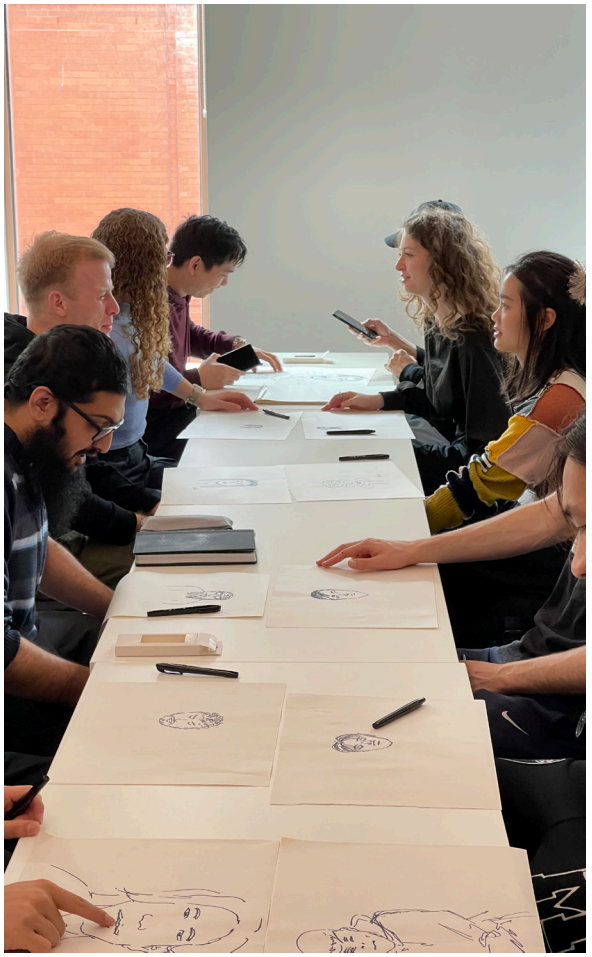
The selection of case studies provided by CC was narrowed down from 13 to 5 based on proximity and participant schedules. The group would also be split up into teams of 3 comprising of 1 postgraduate student and 2 undergraduate students. Before initiating the action week, we liaised with Johnathan to arrange visits, and during the weeks we would keep participants updated on timings and outputs. A retrofit scope presentation was also created and delivered before going on our visits, to better inform our questioning. Additional presentations on how to decipher gathered information were also prepared.

Preperation

While forming the action plan, we agreed that we each activity should have distinctive features that capture the interest of the pupils. The risk assessment was presented to ensure students were aware of the potential threats to watch out for and how risk could be reduced. All students were reminded of the fundamental guidelines for visiting people's houses, such as not touching the homeowner's belongings without permission.

To prepare for visits, we shared active listening and interviewing methods with the students. To make sure great pictures were taken to present in the outputs, a photography skills class was held. An workshop was hosted were the students practiced active listening skills like acknowledging, mirroring, and internal repetition. Through open-ended questioning, we demonstrated successful information-gathering techniques.

We prepared a mock interview while practising interview setups in small groups at various location around Geoffrey Manton - 'our temporary home'. Upon reflection, the prepartory days ran smoothly thanks to a thorough plan of action. While the order of events was flexed to give a more logical sequence of teaching, it facilitated structured engagement.



Architectural Photography + Renders Skills

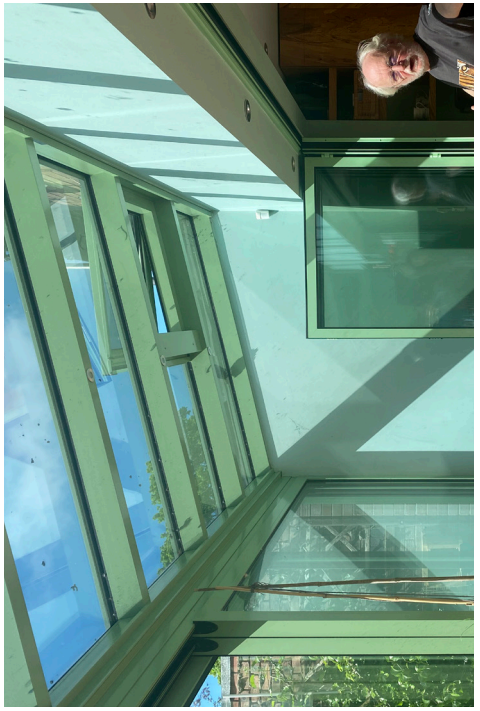
MSA Live Group 3

Retrofit Visits

At the end of the first action week, we visited the residences of five Carbon Co-op members who had retrofitted their homes. They were all located around Manchester, so we divided into smaller groups to interview them and tour their houses. During the interviews, we came to understand why they chose to retrofit their homes and how they achieved this. We also inquired about the advantages have seen from retrofitting their homes, such as savings on bills and a more comfortable living environment. As they are retrofitting pioneers, champions, we asked them for any recommendations they had for those wishing to retrofit their own homes based on their learnings. The house tours allowed us to experience the comfort of a retrofitted house and understand how it influences the appeal of a home and improves daily life.

Hearing about someone's firsthand retrofitting experience was ideal for writing articles on retrofitting. It aided in personalising the case studies, which were critical in informing people intending to retrofit their own homes, since they had proven examples to work from.

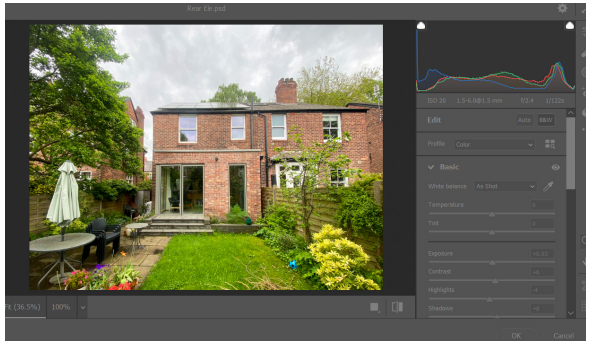
These visits and subsequent articles will help educate individuals on the retrofitting experience, so they would know what to expect if they started remodeling their own homes.



Software Skills / Process

While conducting the case studies, multiple workshops were conducted on software's such as InDesign and Photoshop. As architecture students, we have our own ways of putting together a portfolio. However, it was beneficial to learn skills and shortcuts from each other throughout the software workshops. The biggest takeaway from the photoshop workshop was the command that corrects the geometry automatically. The InDesign workshop, on the other hand, inspired us to use skills such as “buttons” and master pages in our future projects. We learnt that in design Portfolios the buttons might not work during the marking process if not done properly but it was still worth trying since it replaces the repetitive site maps in the site analysis.

We started by gathering information from the interviews on a PowerPoint slide. This helped us to gain an overview of each case study while examining the similarities and differences across each visit. We then had a small workshop on journalistic writing. Since we were creating a 3-page article, a catchy ‘hook’ title became more important in the delivery of the interview’s essence. As a result, we began by writing down the most memorable parts of the interviews. It was interesting how every group member had a different opinion on the 'hook'. As a result, we merged each hook into one big concept before drafting



the case study details. This allowed the case studies' writing process to be reasonably fast as the information was gathered in the initial presentations.

When writing the case studies, we split into five separate groups from the visits. We started by organizing our notes and discussing the main topics from the interviews. Simultaneously, we also chose the most relevant pictures and quotes that we gathered on the site visits. By doing so, we were able to create our plans for the text of the case studies and the first versions of the layouts. We then started iterating the text for the case studies. Once all the groups finished their first version of the case studies, we created a Miro board to compare the five documents and debated the general layout. Throughout this step, we decided on the fonts for the text, quotes, and captions under the pictures. We also discussed if we should have the Manchester School of Architecture logo and how we should align the text with the images. Afterwards, each group fixed their layout and read the others' work to check the spelling and grammar. We also sent the case studies to the retrofit champions to ensure they agreed with what we said in them. Finally, each group revised the final changes and proofread everybody's work to ensure that the final documents would be the best that they could be.

Final Outputs

After much collaboration, and iterations we created the final case study outputs. For each of our five Retrofit Champions we created a three-page pdf which explored the story behind each retrofit. These case studies were formatted in a graphically coherent style which enabled us to create outputs which could be used individually or collectively by our collaborator Carbon Co-op. Upon reflection, this approach worked well to create a set of documents that are linked together rather than appearing as several different documents. However, in hindsight we could have been stricter on the text formatting to further improve the coherence between documents. Overall, the creation of these final outputs was a great success and an opportunity for both MA and BA students to learn a lot about retrofitting from someone's firsthand experience. Upon completion, we went to the offices of Carbon Co-op where we learnt more about what they do and had the opportunity to present what we learnt through the MSA live project.

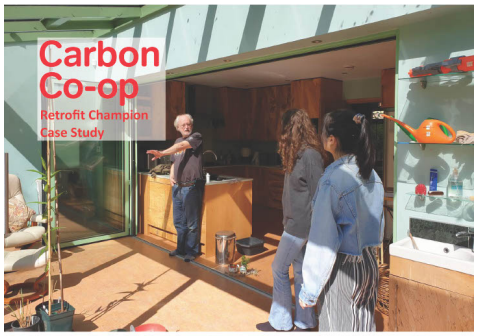
In summary, the MSA live project in collaboration with Carbon Co-op was an enlightening experience where we as students were able to connect with retrofit champions. This allowed us to see how architecture can help in addressing the climate crisis and informed us on how we can make the existing building stock sustainable.

Resourceful Retrofitting: Phoebe's Experience

Born in Hemel Hempstead, a graduate of Liverpool Hope University, Pheobe Spence settled in Stockport in 1979 with her partner. She has lived in the home ever since, which was built in 1920.

As part of her research she visited the Centre for Alternative Technologies (CAT) in 1986. She also took part in conventions such as Green Build, and through visiting various Green Open Homes, she wished to have a low-carbon home. At the same time, with her partner's passing, and her heel injury, she hoped to make the house more accessible. Moreover, she felt it was an appropriate opportunity to fix the roofing felt and parging as well, where she previously had to bale out snow from the loft. Prior to starting her retrofitting project, she had various surveys done by Nick Parsons in 2010 and Carbon Co-op in 2012. She showed us various thermal images from the surveys, which highlighted the cold areas of her house, indicating a lack of insulation. Some of her key points were to, ***"Allow plenty of time, consult widely, and think ahead."***

"Do your research, allow plenty of time, consult widely, and think ahead."



The Blooming Flowers of a Successful Retrofit

When Alan and Monica moved into their 1950's home, the property was in a dilapidated state, with bars on every window, and rotten timber frames. Though hesitant at first, Alan was encouraged by Monica who saw the potential of the site. Guided by their sustainable principles, stemming from their off-grid lifestyles in Scotland, they began the process of retrofitting their home in earnest. Suffice to say that the home they've created is not just warm in its material fabric, but also warm in feeling through soft timber surfaces. The conservatory extension to the rear draws Monica's lavish and colourful garden into the home creating a deep connection with the natural surroundings complementing the interior.

After moving in, they began planning out the essential changes. Initially they aimed to occupy the space whilst also retrofitting it. The process of retrofitting is mainly about making a building as sustainable as possible by reducing heat loss, implementing renewable energy systems and making efficient use of said energy. What Alan and Monica were looking for was to transform the house into a warm and comfortable space, whilst reducing their carbon footprint by re-using rather than replacement and renewal, all while making their own aesthetic considerations. Additional outcomes included making a quiet and peaceful environment, catering to their differing temperature preferences, rethinking the layout of the rooms, as well as using inert materials due to Monica's sensitivity to chemicals.

Decarbonize through Retrofit for a Greener & Smarter Home

For over 25 years, Dominic McCann called his red brick, semi-detached house near Heaton Park in northern Manchester, home. Dominic's signature white wall stood out among the other Victorian homes in the community as a symbol of his forward-thinking retrofit feature. In the early 1990s he quickly realised it needed extensive maintenance. He began with DIY upgrades, and in 2014, his house was chosen to participate in Carbon Co-op's retrofit programmes.

Why did you retrofit your home?

Dominic was primarily concerned about his contribution to greenhouse gas emissions. He decided to make it a personal mission to cut down on his own carbon footprint. Using the services of Carbon Co-op was the most efficient method. They assisted with retrofit management and contractor selection (Jackson & Jacksons), which was crucial to the success of the project.

"Work out your energy use right now"

Dominic's iconic white external wall insulation

Dominic's air source heat pump (ASHP) system

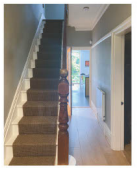
Preserving Victorian Charm: A Modern Retrofit

Upon buying their semi-detached Victorian home in 2016, retired exhibition curator Julian Tomlin and his wife wasted no time in remodelling it. At first, they found the house to be "poor in terms of environmental performance" but following the retrofit it has become "much more comfortable". With the help of "a lot of good advice" from other Carbon Co-op members and his experience as a former committee member, Julian was able to transform his home into a 'masterpiece of retrofitting'.

What changes were made?

Julian made numerous alterations to his home. He fitted new triple-glazed windows designed to preserve the original stained-glass panes and sash form. Other measures included, installing an air source heat pump, a Mechanical Heat and Ventilation Recovery system, new radiators, and internal wall insulation with airtightness membranes. He also added an extension to enhance the internal spaces and installed PV panels for a sustainable power source.

"We're not getting any younger and so, we knew we were more liable to feel the cold."



Profitable retrofit: Lloyd's story

Scientist Lloyd Hamilton and his wife bought the Heald Green residence in December 2016. It has three bedrooms, two bathrooms, and three toilets. In 2017, he retrofitted the house due to its terrible state. The family paid for about £65,000 pounds in renovations with their savings. They moved into the home September 2018 after the works had finished.

The house was in a poor shape when they first moved there. He believed that if he and his family simply lived there, they might become ill. They wanted to make the house more liveable and homely. Poor insulation, according to Lloyd, created a draughty environment and cost a lot of money in heating bills. Vegetation was already taking root on the roof, which was also being penetrated by water. He also said he wants to be a part of the movement that reduces house carbon emissions in order to address the climate crisis we are currently experiencing. He said it's a long journey to retrofit the house, but he thinks it's better for him to just do it.

"It's a long journey to retrofit your house, but yeah, just go ahead and do it."

Lloyd's new opening creates a brighter space

ABOUT

Each year the MSA LIVE programme unites Masters Architecture year 1 students with those in BA year 1 and year 2 and Masters Landscape Architecture 1 in mixed-year teams to undertake live projects with external partners to create social impact.

LIVE PROJECTS

All MSA LIVE projects are live. A live project is where an educational organisation and an external partner develop a brief, timescale, and outcome for their mutual benefit.

SOCIAL IMPACT

All MSA LIVE projects have social impact. Social impact is the effect an organization's actions have on the well-being of a community. Our agendas are set by our external collaborators.

EXTERNAL PARTNERS

MSA LIVE projects work with many organisations: charities, community groups, social enterprises, community interest companies, researchers, practitioners and educators.

STUDENT-LED

Our MSA masters students take the lead in the project conception, brief development, delivery and co-ordination of a small project. Other cohorts joined for an eventful 2 weeks of activities at the end of the academic year.

KNOWLEDGE TRANSFER

Working in teams within and across year groups and courses; MSA students participate in peer to peer learning. In addition, collaborators, participants and students engage in the transfer of tangible and intellectual property, expertise, learning and skills.

LARGE SCALE

This year approximately 650 students from 4 cohorts in MSA have worked on 42 projects with partners.

QUESTIONS

For questions about MSA LIVE please contact the MSA LIVE team:
msalive@mmu.ac.uk

BLOG

live.msa.ac.uk/2023

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