

Taking responsibility for carbon emissions – The evolution of a Carbon Literacy Living Lab

Rachel Dunk, Jane Mörk, Jonathan Davies, Jenny Davidson, Christopher Paling, John Hindley, Sophie Leigh and Helena Tinker discuss the impact that the Carbon Literacy Project has had on students and staff at Manchester Metropolitan University.

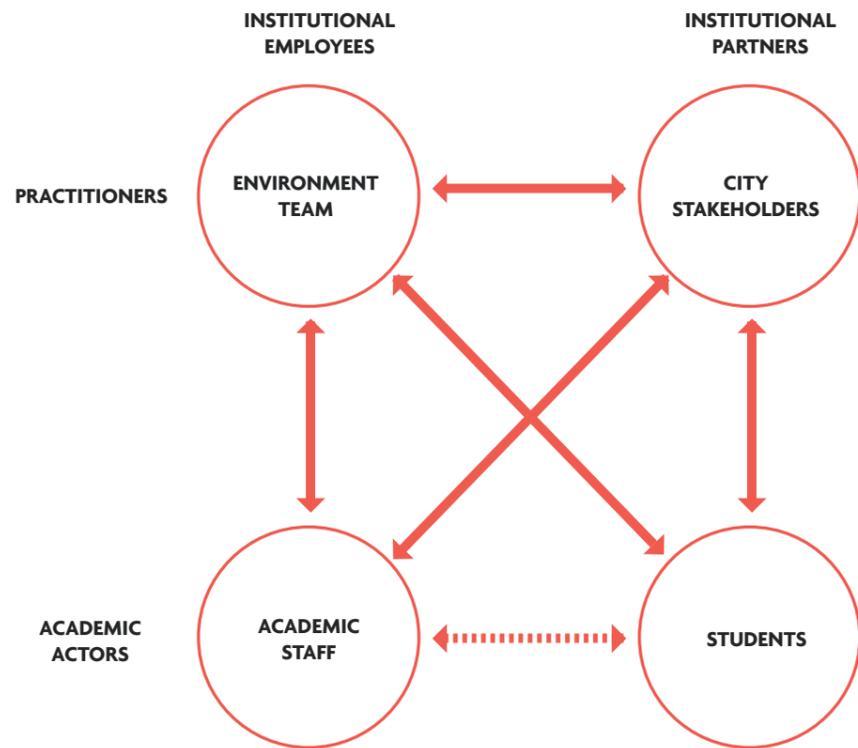
Climate change is recognised as one of the major sustainability challenges facing humankind, where to limit the global temperature increase to 2 °C (the upper limit set by the United Nations Framework Convention on Climate Change Paris Agreement¹) will require rapid and substantial reductions in greenhouse gas emissions (hereafter referred to as carbon emissions). While taking action on climate change is only one aspect of the broader sustainable development agenda, climate and sustainability are intrinsically linked, where the reduction of carbon emissions is of critical importance to sustainable development.

Higher Education Institutions (HEIs) have a key role to play in facilitating the transition to a more sustainable low carbon society, not only through embedding best practice into their own operations, but also through their role as educators, researchers, and community leaders. One critical component of the HEI response to sustainability challenges is 'education for sustainable development', or ESD, an interdisciplinary approach to teaching and learning that encourages students to consider concepts such as environmental stewardship, social justice, and global citizenship, and how they relate to their private and professional lives.

Promoting global citizenship is a key aspect of ESD, where it is important that students recognise their own role in the global community, and have the skills

and global perspective necessary to find innovative solutions to complex problems. In response, HEIs are engaging with the internationalisation agenda to provide their students with a global learning experience. While internationalisation is a broad concept that encompasses many activities, student mobility is the most visible aspect, where two core strategies adopted by the UK Higher Education sector are the recruitment of international students and the provision of 'study abroad' schemes. While these activities are financially beneficial for HEIs and provide ESD benefits such as promoting global citizenship, there are also significant carbon consequences due to the associated emissions from air travel. Thus, while there are synergies, there are also conflicting priorities with regard to the UK Higher Education sector's internationalisation and sustainability agendas.

However, while the Higher Education Funding Council for England (HEFCE) acknowledges this conflict within its sustainable development strategy², it does not make any recommendations or offer any solutions to resolve it: "Over the last 10 years there has been an increasing recognition of the need to educate our students to become 'global graduates'. Often this has meant providing UK students with opportunities to travel overseas to study at partner institutions, conduct research, or contribute through voluntary work to community development in another



▲ Figure 1. The ‘basket of relationships’ between stakeholder groups, alongside the ‘basket of principles’ (Box 1), that inform the Carbon Literacy Living Lab at Manchester Met.

country. Similarly, international students, who bring so much to life on UK campuses, have to travel in order to study here. But air travel, in particular, has a carbon cost associated with it².

In this paper, we present an overview of the novel institutional response to this conflict at Manchester Metropolitan University (Manchester Met), a response that evolved from a collaboration between the Environment Team and academics into a fully-fledged ‘Carbon Literacy Living Lab’ that actively engages students with a societal response to climate change. We use the Environmental Association for Universities and Colleges’ Living Lab model³ to describe the development of the project to date and outline intended future activities, highlighting the relationships between and within the four main stakeholder groups of professional staff, academics, students and external actors, and the principles that shaped the approach and activities (Figure 1).

PROJECT INCEPTION

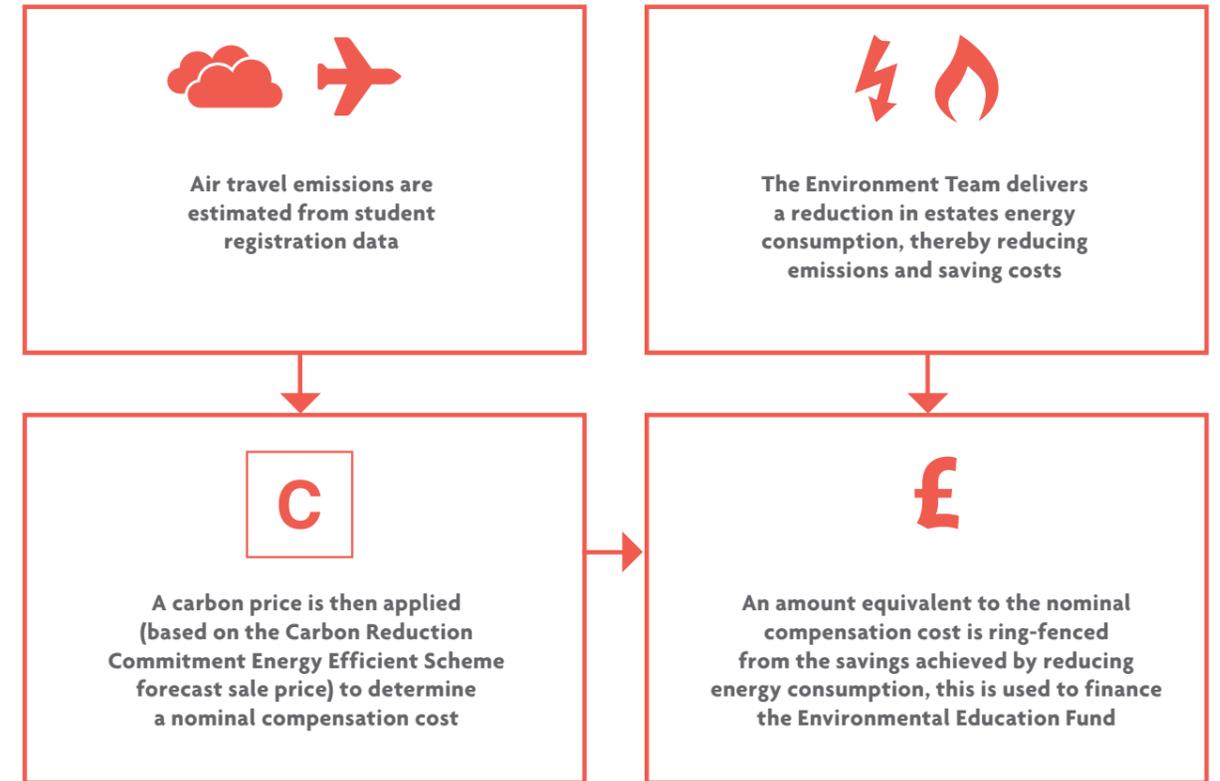
Manchester Met places a strong importance on environmental sustainability, where the initial impetus for this project arose from an early recognition of the conflict between the carbon management and internationalisation agendas, and the desire to develop

BOX 1: THE BASKET OF PRINCIPLES

- Real Sustainability Challenge
- Formal Participation
- Stakeholder Partnerships
- Co-creation & Co-Implementation
- Transdisciplinarity
- Geographically Bounded

an appropriate institutional response. This led to a collaboration between the Environment Team and academic researchers to evaluate the emissions arising from international student air travel⁴ and to explore a range of potential compensatory actions. This work included co-funding a PhD research student⁵ and ultimately led to the development and implementation of an internal mechanism to finance an ‘Environmental Education Fund’ or EEF (Figure 2).

In determining the compensation approach, a number of options were considered, including investment in on-site emission reduction projects, purchase of certified carbon offsets and educational initiatives. The first



▲ Figure 2. Mechanism for financing the Environmental Education Fund.

option was rejected as Manchester Met already had a strong commitment to reducing carbon emissions, with a stretch target to reduce emissions from operational energy use by 50 per cent below 2005 levels, by 2020. Thus, while it would present the opportunity to engage students in on-site initiatives, any investment in internal projects would not have generated ‘new’ emissions reductions over and above those the university was already committed to making. Purchase of high quality certified offsets would avoid this issue of double counting and would also enable the university to formally report that the carbon costs of students’ flights had been compensated for in their carbon account. However, this option would be purely transactional, bypassing the opportunity to engage university members and wider stakeholders with the climate change challenge. For these reasons, the preferred compensation approach was to establish an EEF, with the principal aim of actively engaging the student body (and through them, the wider community) so as to encourage and support them to take action on climate change

THE REMIT OF THE EEF – THE MANCHESTER CONTEXT

The remit of the EEF was determined with a strong reference to the Manchester context, specifically the citywide climate change action plan – Manchester: A Certain Future (MACF)⁶.

Published in 2009, MACF was developed by a wide range of city stakeholders and had two headline objectives: to reduce Manchester’s emissions by 41 per cent below 2005 levels (by 2020), and to bring about a low carbon culture change through embedding low carbon thinking into the lifestyles and operations of the city. The 41 per cent target reflected a best estimate of Manchester’s fair contribution to meeting the UK Climate Change Act targets⁷, and has since been extended to a stated ambition to become a ‘zero carbon city’ by 2050. The joint focus on culture change reflected the understanding that the deep emissions cuts required to limit or prevent dangerous climate change are technologically, politically, and culturally challenging. For citizens to understand the scale of the problem and feel empowered to take action was therefore viewed as a critical issue, both to promote behavioural change and to increase the acceptability of climate mitigation initiatives.

The Carbon Literacy Project (CLP)⁸ was established in 2012 as the key delivery vehicle for promoting low carbon culture change. Recognised in 2015 at the 21st Conference of the Parties to the United Nations Framework Convention on Climate Change (COP21, where the outcome was the Paris Agreement⁹) as one of 100 ‘Transformative Action Projects’ from around the world, the CLP is an education initiative that aims

BOX 2: THE CARBON LITERACY STANDARD⁸

Knowledge

Carbon Literacy training provides students with a knowledge of the basics of climate change science and what we can do to reduce our impacts.

Values

This is achieved by instilling a number of values:

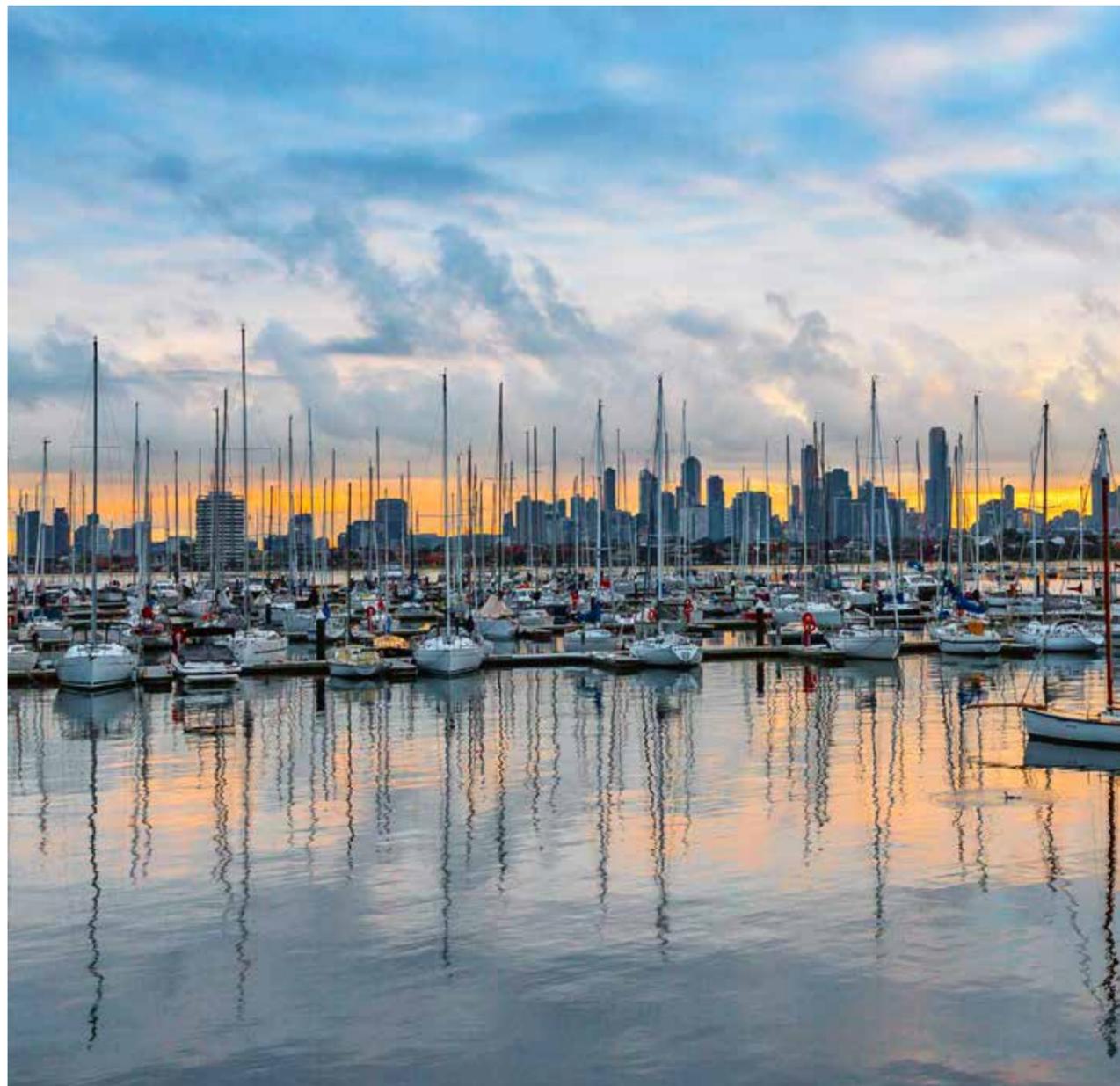
- The actions of individuals can and does make a difference.
- We need to work with others to create change.
- Overall, the outcome of the changes we need to see can lead to a better world and a better way of life.
- Equity and fairness.

Action

By the end of the training two actions will have been created; one individual and one group.

Learning and training

A number of different teaching methods are utilised including 'local' social learning, delivery of training by peers, and group enquiry. The course lasts the equivalent of one full day, but can be delivered via multiple, shorter sessions.



to provide everyone that lives, works and studies in Manchester with access to carbon literacy training. Acting as a standards body, the CLP accredits third party training courses and checks that trainees have met the requirements to be certified 'Carbon Literate' (see **Box 2**). Manchester Met has actively supported the CLP from its inception, being one of the first organisations to pilot carbon literacy training to its students, and offering a variety of carbon literacy training and 'train the trainer' programmes to other city stakeholders.

By early 2017, over 6,000 stakeholders had completed carbon literacy training. However, the population of Manchester is around 500,000 people. The CLP thus faces a significant challenge in terms of how to scale-up activities to the level required to meet its stated aim of offering carbon literacy training to all the citizens of Manchester. As with the CLP and the city, Manchester Met likewise faces the challenge of how to offer carbon literacy training to all members of the university. It was therefore decided that the primary remit of the EEF would be to support student carbon literacy training delivered via a novel extracurricular cascade training model, where the model was designed to both increase students' employability skills, and extend the viability and scope of carbon literacy training at the university, and beyond (see **Figure 3**).

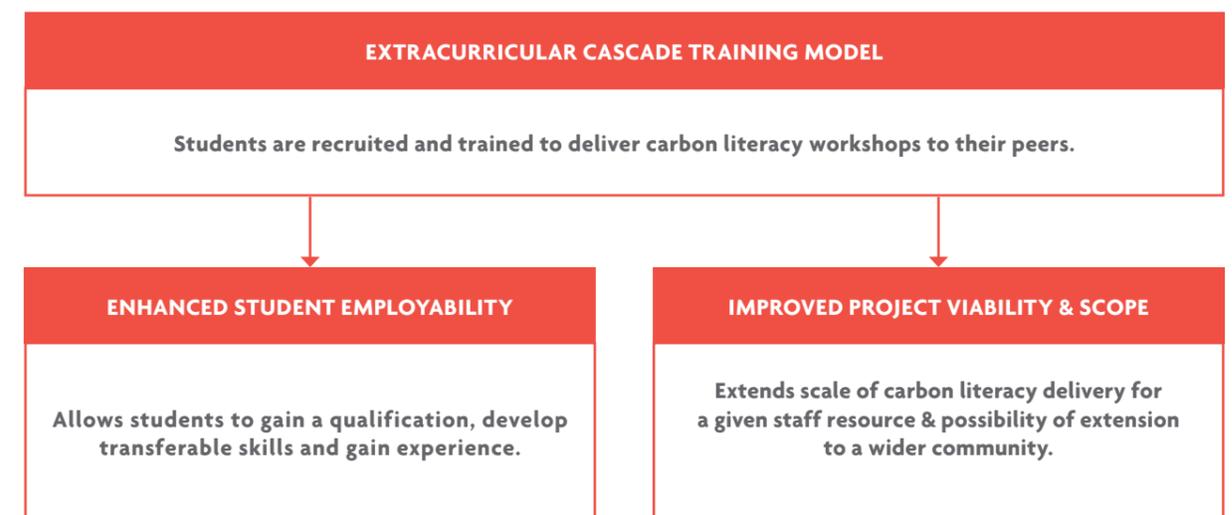
DEVELOPING CARBON LITERACY FOR STUDENTS

In order to support the extracurricular delivery model, two training packages were developed by the academic and Environment Team staff together with a student intern: the Carbon Literacy for Students (CL4Ss) training course and the CL4Ss Train the Trainer programme.

In order to ensure that all students would have the opportunity to become CL4Ss trainers (irrespective of disciplinary background/depth of knowledge regarding climate change), and that the prospect of delivering the training was not too daunting, the CL4Ss training was developed as a two part programme. Part 1 focuses on the basic scientific knowledge of climate change and can be completed in one of three formats: (i) via an online e-learning module developed by the CLP, (ii) attendance at a climate change film screening and discussion panel, or (iii) attendance of a face-to-face session delivered by a member of academic staff (e.g. lectures and/or workshops embedded in the curriculum). Part 2 (the component delivered by student trainers) is a face-to-face workshop which focuses on taking action in response to climate change and explores how to communicate climate action to others. The workshop is highly interactive, comprising a series of activities that aim to stimulate discussion amongst the participants. Since the training was open to all students registered at Manchester Met it was anticipated that students from different disciplinary backgrounds would be able to bring different points of view to these discussions.

The development of the CL4Ss Train the Trainer programme was carried out in close consultation with the CLP, who reviewed the 'Carbon Literacy Trainer Standard' at the same time, in order to ensure that the student trainers would reach the standard required to formally qualify as a trainer.

The CL4Ss Train the Trainer programme is open to any student who has successfully completed the CL4Ss training, and was designed to enable carbon literate students to deliver the face-to-face element



▲ **Figure 3. The Manchester Met extracurricular cascade training model for delivering carbon literacy.**

of the CL4Ss training to fellow students. In order to qualify as a CL4Ss Trainer, the students have to attend five half-day training sessions. The programme focuses on developing training skills such as listening, questioning and presentation skills. The programme also offers students the opportunity to deliver the activities from the CL4Ss workshop to each other, as well as providing peer feedback. In the final session, the group co-deliver the full CL4Ss workshop together.

The student trainers have to commit to delivering at least four sessions: two sessions in which they are observed by a staff trainer, and a minimum of two further sessions per academic year, delivered independently with a peer (co-trainer). Students taking part in the scheme are paid for delivering the training (from the EEF via Manchester Met's student employment agency, Jobs4Students), and can also reflect on their experience and the skills they have developed in order to apply for the Future Skills Award, Manchester Met's extracurricular student employability award.

The programme has now been running for two academic years, where the training is reviewed on an annual basis in collaboration with the students

that have completed the programme. To date, fourteen students have qualified as trainers and have collectively delivered the CL4Ss workshop to over 400 of their peers. Feedback from the student trainers indicates very positive outcomes, including an enhanced sense of responsibility to take action on climate change, enhanced team-working, leadership and communication skills, and perhaps most importantly, increased confidence.

ENGAGING STUDENTS WITH THE WIDER COMMUNITY

Alongside working with students to provide carbon literacy training within the university, since 2013 Manchester Met staff have also been engaged to deliver carbon literacy training and train the trainer programmes to a wide range of external stakeholders, both within Manchester and further afield (Figure 4). The next evolutionary development of our project is to extend this wider engagement to the student body, where the first steps towards achieving this have already been taken. For example, two of our student trainers have successfully delivered CL4Ss to students at the Institut National Polytechnique de Toulouse, and undergraduate project students have evaluated training programmes within external organisations. In the coming year, students will be engaging with the

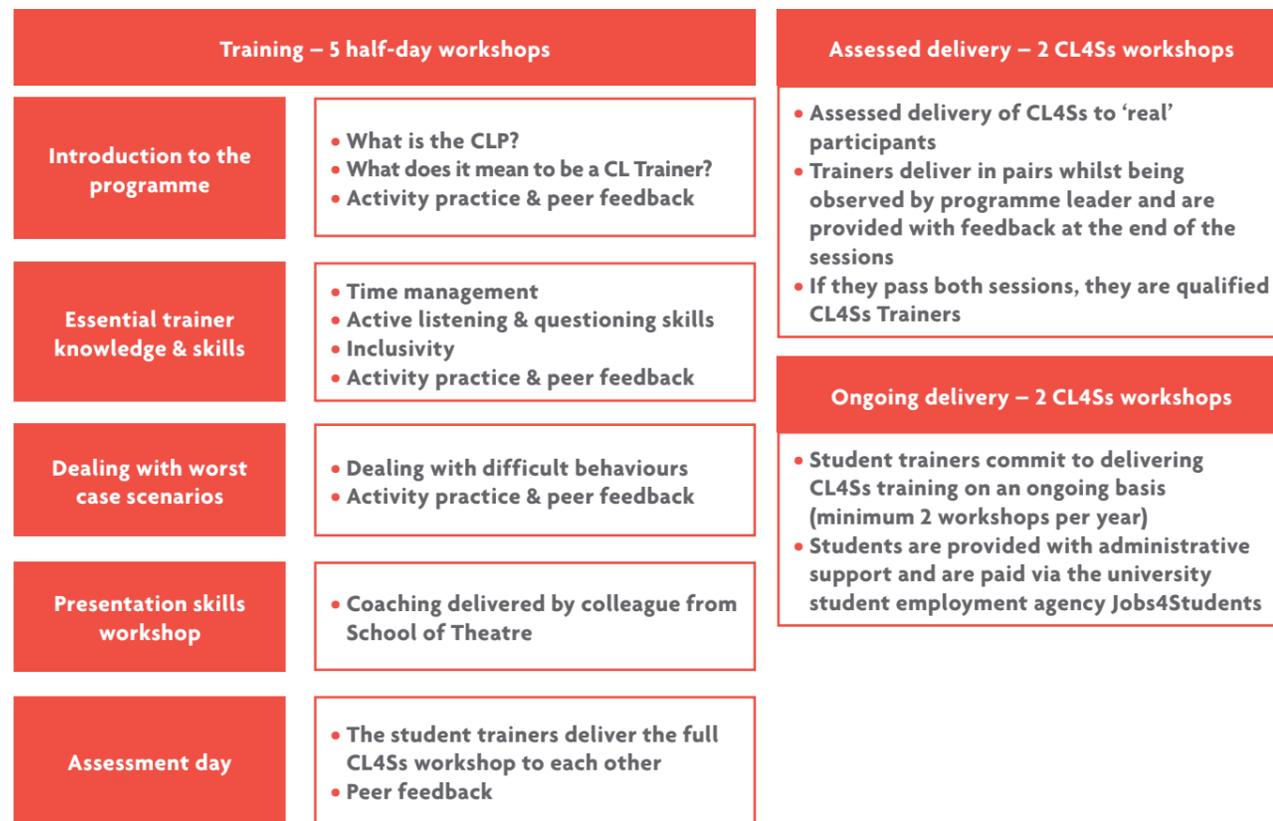
Third Sector to develop and trial training packages aligned to their areas of special interest (such as nature and conservation based charities). In addition to actively involving students in these opportunities, as the body of carbon literate students and student trainers increases, we anticipate (and will encourage and support) more examples of student led initiatives to expand the delivery of carbon literacy training beyond the boundaries of Manchester Met. **ES**

Dr Rachel Dunk is a Principal Lecturer in Environmental Management and Sustainable Development at Manchester Metropolitan University. Her research interests focus around the science and policy of carbon, energy and waste management, and she provides carbon management and sustainability consultancy and training services to the public, private and third sectors.

Jane Mörk is a Senior Research Assistant in the School of Science and the Environment and Manchester Metropolitan University. Her main area of work is to develop and deliver Carbon Literacy training and the accompanying train-the-trainer programmes to university staff and students as well as to external organisations.

REFERENCES

1. United Nations Framework Convention on Climate Change (2015) *Adoption of the Paris Agreement, 21st conference of the parties*. Paris: United Nations.
2. Higher Education Funding Council for England (2014) *Sustainable Development in Higher Education – HEFCE's Role to Date and a Framework for its Future Actions*. Higher Education Funding Council for England. <http://www.hefce.ac.uk/media/hefce/content/pubs/2014/201430/HEFCE2014_30.pdf>
3. Environmental Association for Universities and Colleges (2017). *A revolution for post-16 education – Part 2: how do Living Labs work? Environmental Association for Universities and Colleges*. Available at: <www.eauc.org.uk/eauc_living_labs_project> [Accessed: 21/07/2017].
4. Davies, J. C. and Dunk, R. M. (2016) Flying along the supply chain: Accounting for emissions from student air travel in the higher education sector. *Carbon Management*, 6 (5), pp.233–246. doi: 10.1080/17583004.2016.1151503
5. Davies, J.C. (2016) *Exploring the inherent conflict between the internationalisation and carbon management agendas in the UK Higher Education sector*. PhD Thesis. Manchester Metropolitan University.
6. Manchester Climate Change Strategy 2017-2050. <www.manchesterclimate.com/plan>
7. Government of the United Kingdom (2008) *Climate Change Act*. <<https://www.legislation.gov.uk/ukpga/2008/27>>
8. Carbon Literacy Project. <www.carbonliteracy.com>



▲ Figure 4. Overview of the CL4Ss Train the Trainer programme.

