ELLEN MACARTHUR FOUNDATION

The circular economy in higher education

Insights from course offerings in London and New York

ABOUT THE REPORT

The circular economy model is becoming increasingly recognised globally as a systemic shift necessary to tackle global challenges such as climate change, waste and pollution, and biodiversity loss, while creating a resilient, regenerative, and distributive economy that can be sustained in the long term.

The circular economy is a mindset, a systems approach to solving some of the world's largest problems. It is imperative for students to learn about the circular economy, so they can apply this mindset to problem solving in their vocation, whether as future designers, business leaders, policy makers, or other professions.

Circular economy course offerings in higher education have been steadily growing since the Ellen MacArthur Foundation (the Foundation) first published a study in 2018 which mapped circular economy courses in higher education globally. 138 higher education institutions were identified that offered circular economy courses.

Since then, the Foundation has strategically partnered with cities including London, São Paulo and New York, to drive circular economy demonstration at the city level.

The direction of travel for higher education institutions to accelerate the transition to a circular economy in cities focuses on five drivers:

1. Teaching the circular economy, so that every student engages with the circular economy when they choose to study at an institution in their city
2. Applied research that supports the circular ambitions of businesses within the city
3. Campus management that enables institutions to be circular in their operations
4. Student-led initiatives that empower students to drive forward circular economy activities both on and off campus within the city
5. Leadership and influence of faculty that inform business or government strategy

138

higher education institutions were identified in 2018 that offered circular economy courses

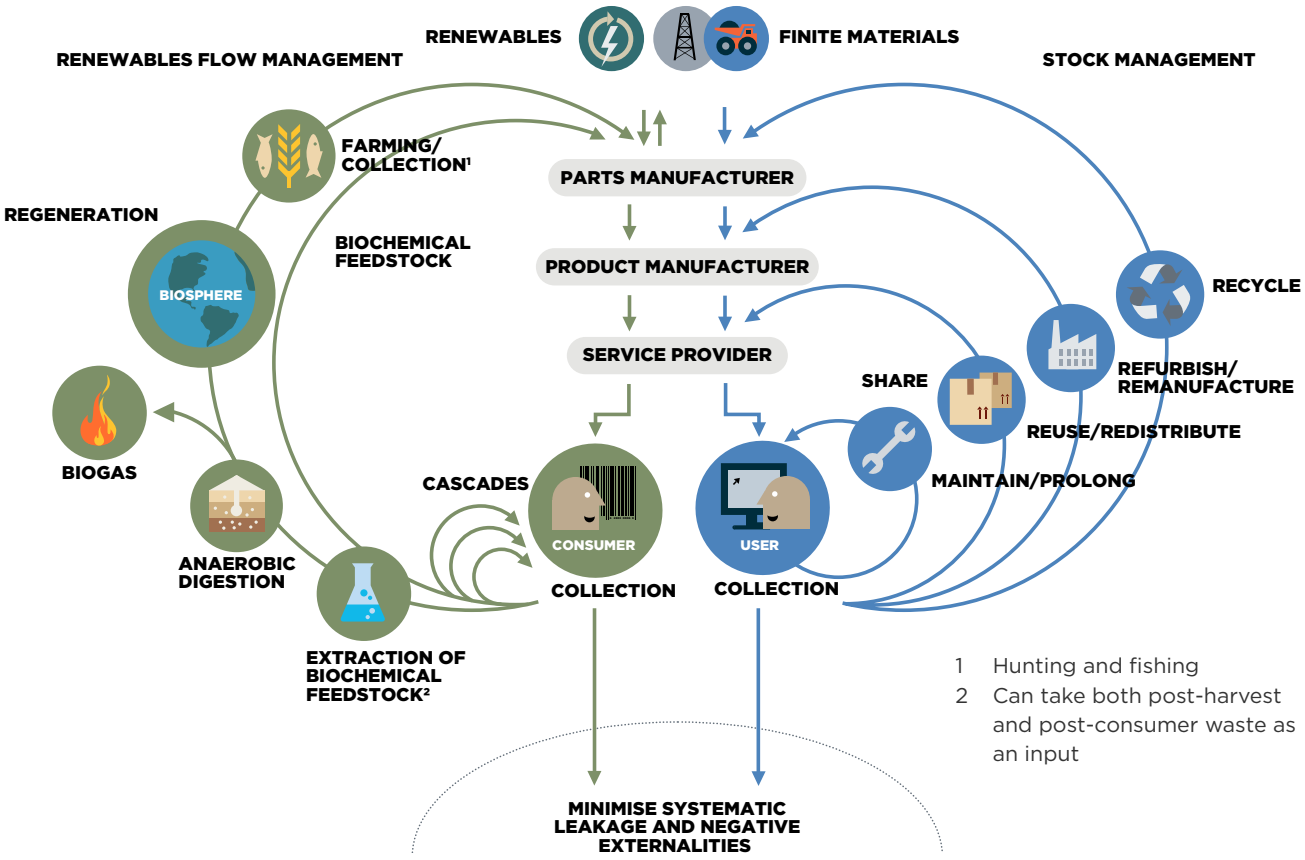
To assess the extent of circular economy learning offerings in London and New York-based higher education institutions, the Foundation worked with Social Business Consulting, a student-run social impact consultancy at Cornell University, New York.

This is a summary of the key takeaways identified in the student's research, read the full report here. In the study, 80 circular economy courses (undergraduate and postgraduate) were analysed from universities based in London (37 courses) and New York (43 courses). In contrast to the 2018 study, courses identified did not have to explicitly mention circular economy in their title or description; rather, a broader set of related terms were included. Additionally, learning opportunities beyond the classroom such as research projects and workshops, were taken into consideration.

The courses were evaluated across three categories:

1. *Circular economy verticals – design, fashion, finance, food, plastics, circular business models*
2. *Elements of the technical cycle of the butterfly diagram (fig 1) – share, maintain, and prolong, reuse and redistribute, refurbish and remanufacture, and recycle*
3. *Elements of the biological cycle of the butterfly diagram (fig 1) – cascades, regeneration, biochemical feedstock, farming/collection, renewable energy*

FIGURE 1 **Circular economy systems diagram**



SOURCE: Ellen MacArthur Foundation Circular economy systems diagram (February 2019)
www.ellenmacarthurfoundation.org | Drawing based on Braungart & McDonough,Cradle to Cradle (C2C)

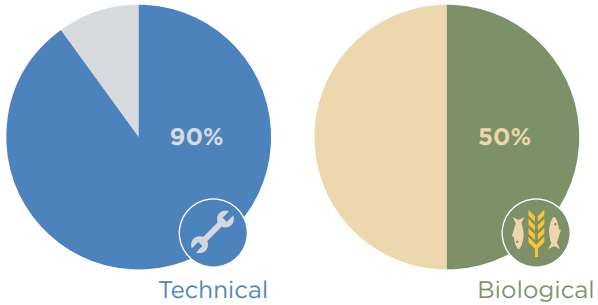
KEY TAKEAWAYS

1 There are more circular economy learning offerings and research projects that focus on elements of the technical cycle than the biological cycle

This is not surprising considering the courses surveyed fell mostly under design, circular business models, plastics, finance, and fashion, with only 5% in food systems. Additionally, the elements of the technical cycle of the circular economy butterfly diagram are more developed concepts, with far more research and case studies behind them, than those of the biological cycle. **At least one element of the technical cycle was covered in 90% of the courses surveyed, whereas less than 50% of courses surveyed covered one or more elements of the biological cycle.** Currently, aspects of the biological cycle, (such as anaerobic digestion, composting, restoration and farming etc.) are addressed more often through applied learning opportunities and student or campus activities, such as Growhampton, the circular food project run by students at Roehampton university, London. Another example is the Urban Farm Lab at NYU, an outdoor classroom, research lab, and community farm, where students from the Department of Nutrition and Food Studies collaborate and learn how to grow, care for, and harvest seasonal edible crops in an urban environment.

There are clear future opportunities for research to further explore and identify courses which cover the biological side of the circular economy, whether it be food and farming, dietary health, chemistry and anaerobic digestion, habitat management, etc.

There is also an **opportunity to integrate more of the biological cycle into circular economy teaching**, such as making use of the Foundation's resources, reports and illustrative example case studies (eg. regenerative farming in São Paulo) . The Foundation's Food Initiative outlines the circular economy vision for food systems, with case studies and teaching resources available. Recently the Foundation published a new study demonstrating how **the circular economy can play a fundamental role in halting and reversing biodiversity loss.**



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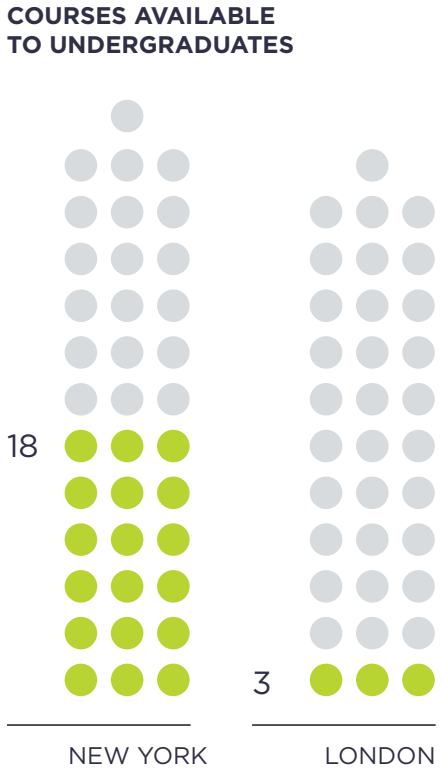
2 There are more circular economy courses available to undergraduates in New York (18 of 37 courses) compared to London (3 of 34 courses)

These findings may partially reflect the key differences between the two regions' education systems. Students in North American universities are able to take a broader initial approach and select a range of courses and subjects in their first year of study, compared to British universities, which are highly specialised from year one, focussing usually on one subject area.

Universities in London are beginning to **leverage the opportunity of including circular economy in general curricula and via mandatory courses.** The London School of Economics (LSE), for example, is developing a circular economy module to include in their LSE100 course taken by all first-year students. Mandatory undergraduate courses such as this are an effective way to reach a larger number of students who study subjects in which the circular economy would be unlikely to feature. The Foundation advocates for more universities to provide undergraduate courses incorporating the circular economy. Academics can refer to the Foundation's Higher Education Resource for suggestions on how to teach the circular economy to undergraduates, with guidance on how to begin embedding circular economy as part of their area of expertise and teaching.

One of the ambitions set out in the Foundation's Direction of Travel for higher education is for all undergraduate and post-graduate students to have at least one learning touch point with the circular economy during their studies. All students will interact with material products during their education so it is important for them to understand the unsustainable linear system through which most products are created and wasted. It is equally **important for them to feel empowered with a solutions framework like the circular economy**, so that whether they go on to design, sell, or procure products in their careers, they can make better choices.



3 Applied learning methods are an effective way for more students to learn about the circular economy outside of the classroom and provide an opportunity to create positive impacts on campus and in the local community

University campuses provide a great testing ground for circular economy interventions. For example, in a campus' food system, anaerobic digesters and composters can be embedded on the campus (or taken off-site if space is an issue, for example at Imperial College London), allowing for compostable food packaging to be used in canteens. The compost can then be used on campus allotments, growing fresh produce using regenerative practices for use in canteens.

Change can also be led by students which becomes an empowering learning opportunity. At LSE, students from the Sustainable Futures Society conducted research on plastic and food waste generated on their campus, and identified reduction solutions which the campus sustainability team welcomed and integrated into their strategy.

At Barnard College, New York, students led a survey to explore access to art supplies and materials and set up a social media group dedicated to exchange and reuse. Students from the Environmental Science department created waste management plans for the college, some of which have been successfully implemented. These practices lead to waste diversion from landfills, also lowering the college's carbon footprint.

There is a clear opportunity to provide more applied learning experiences for students on the circular economy, to reach more students who may not learn about the circular economy in their degree, and to potentially have a positive impact on the campus or local community.

7 in 8

professors believe the circular economy can be better incorporated into campus infrastructure

2 in 3

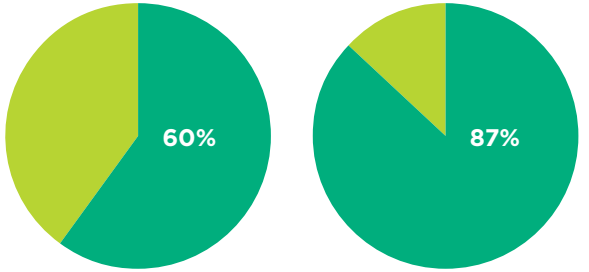
believe it should be a part of the general curriculum

4 Administrative barriers pose a challenge to updating existing courses to include circular economy language

From engaging with the Foundation's network of higher education lecturers and professors, we know that it is often easier to teach the circular economy 'by stealth'. There is a significant delay in incorporating the right terminology into official course paperwork — the term 'sustainability' has become more commonplace throughout education and in a variety of disciplines, and it will take time for the term 'circular economy' to achieve the same level of reach. Often, teaching by stealth is more effective rather than waiting for administrative processes to take hold. **It is, however, vital that the foundations are laid now so that circular economy terminology is included in official course paperwork in the future.** Students are increasingly interested in learning about and/or working in the circular economy field. The language used in course titles and syllabi does matter if students are going to find the right courses to learn about the circular economy and take that knowledge into their careers. This language barrier makes it challenging to accurately assess the number of courses where circular economy is taught.

Research has shown that over 60 percent of all UK university students want to learn more about sustainability, with 87 percent of all students agreeing that their universities should take sustainability seriously. As the circular economy is key to the overall concept of sustainability as an innovative solutions framework, there is an opportunity for universities to better meet the demand of their students and upskill future leaders to disrupt and transform outdated systems. Teachers should continue pushing to include the language of the circular economy in course syllabi, demonstrating the link between the circular economy and climate change, systems thinking, biodiversity loss, the UN's Sustainable Development Goals, and other sustainability topics.

We also recommend that universities audit their own courses to better understand the breadth of circular economy courses which can then be advertised to students looking to learn about the circular economy. Furthermore, as a growing vocational field, it would be useful to survey students to better understand how many are interested in learning specifically about the circular economy and seeking employment in that field.



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5 A universal framework to assess the quality of circular economy courses would be useful to identify and uphold best practice

In addition to above mentioned challenges around naming conventions for courses covering circular economy concepts, there does not yet exist a standard to assess what good looks like when it comes to teaching the circular economy in higher education. One study has found that **in 2017 there were 114 different circular economy definitions currently used by scholars and practitioners.** A challenge arises when teaching circular economy if a disproportionate emphasis is placed on recycling, while the framing as a systemic shift is often omitted. The Foundation has published a higher education resource to help guide educators in correctly framing the circular economy and enabling their students to develop the systems-mindset which is so important when tackling some of the world's biggest challenges.

The Social Business Consulting group has attempted to create such a framework (see p.13 in full report) which is ripe for further development. It evaluates courses based on how well they cover:

- The three circular economy principles
- Systems thinking
- Elements of the technical and biological cycle
- Modes of teaching and application of knowledge

In order to aid in the understanding of circular economy, the Foundation has developed a glossary of commonly-used terms that can be applied to any sector of the economy.

114

Different circular economy definitions were used by scholars and practitioners in 2017

CONTACT

If you represent a London-based university and are interested in signing onto the London Direction of Travel, register your interest here.

To learn more about the Foundation's activities across Higher Education and how your institution can get involved, reach out to Jennifer Mealing, Higher Education Network Manager
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The Ellen MacArthur Foundation, an international charity, develops and promotes the circular economy in order to tackle some of the biggest challenges of our time, such as climate change, biodiversity loss, waste, and pollution.

We work with our network of private and public sector decision-makers, as well as academia, to build capacity, explore collaborative opportunities, and design and develop circular economy initiatives and solutions.

Increasingly based on renewable energy, a circular economy is driven by design to eliminate waste, circulate products and materials, and regenerate nature, to create resilience and prosperity for business, the environment, and society.

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Charity Registration No.: 1130306
OSCR Registration No.: SC043120
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