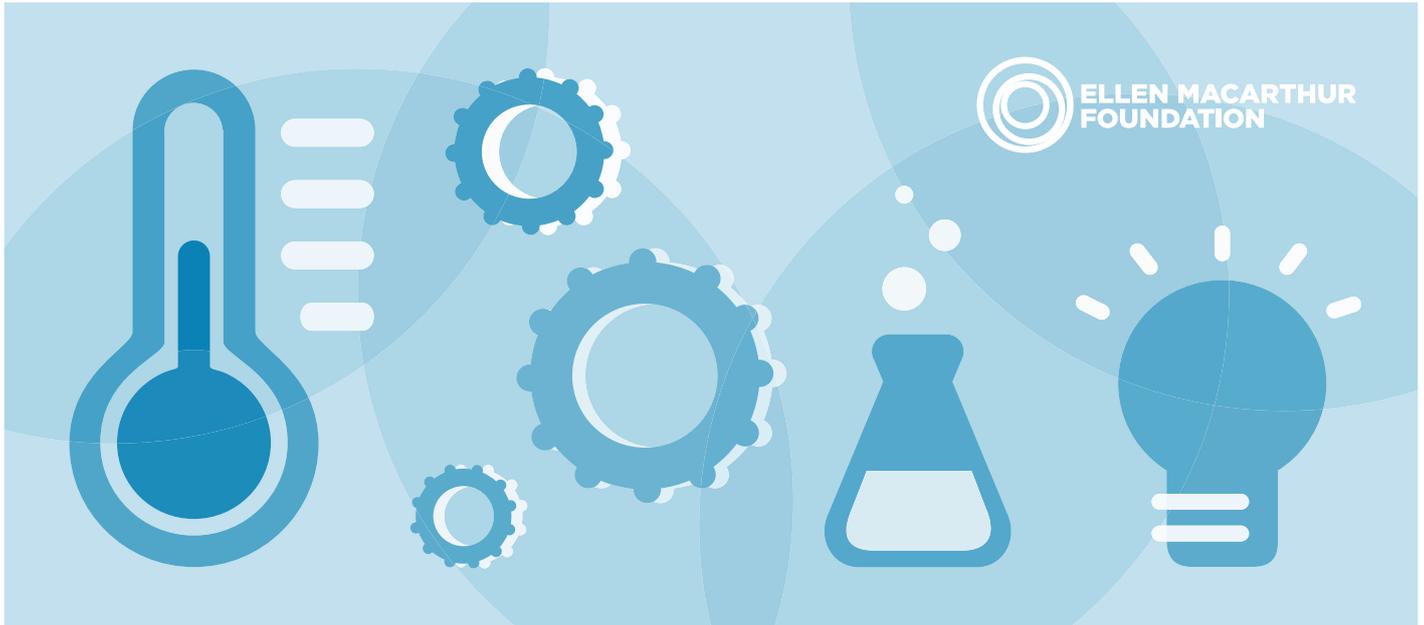


RESEARCH HOT LIST

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V.1



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The Research Hot List is published by the Ellen MacArthur Foundation and distributed to our business and education networks.

If you would like to find out more, please contact:
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RESEARCH HOT LIST

The Research Hot List aims to stimulate research collaborations between CE100 members and the Foundation's Academic Network. The Hot List indicates the research areas that are especially important to CE100 members in their transition towards a circular economy and how to get in touch with them. It is distributed to the CE100 group through the Library as well as to the academic network of the Foundation (Network, Partner and Pioneer Universities).

This is a living document updated regularly as organisations' priorities evolve. The following four items are communicated in the Hot List:

- The research areas of most importance to the organisation's transition to a circular economy
- Specific research projects planned in the short term
- How the organisation typically works with academia
- Contact details

If you would like to add or amend your organisation's information, please contact:
dale.walker@
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HOT LIST CONTRIBUTORS

GLOBAL PARTNERS

Strategic corporate partners, acting as pathfinders across key sectors of the economy to drive circular innovation at scale.

COMPANIES

Leading companies from relevant industry sectors, already pioneering circular economy practices or looking to build capacity.

REGIONS

Countries, cities and municipalities that wish to create a fertile environment for the growth of a circular economy (including supporting local SME development, and alignment of policy and education).

EMERGING INNOVATORS

Start-up businesses with a globally unique technology, service or solution for scaling up a circular economy (typically, businesses with revenues of less than US\$20 million).

Philips (Global Partner)

Royal Philips of the Netherlands is a diversified technology company, focused on improving people's lives through meaningful innovation in the areas of healthcare, consumer lifestyle and lighting.

Research areas of importance to the transition to a circular economy

- Customer Behaviour and interaction
- Design for repair, reuse, refurbishing and recycling
- Innovation to support service-based businesses
- Co-creation tools with stakeholders to enable loops

Research projects planned in the short term

- Lifetime prognostics of systems
- Risk-benefit calculation for service deals
- Product assessment and design tools for circular economy

Typical relationships with academia

- Student internships
- Graduate projects

Contact details

Markus Laubscher
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The Philips logo is displayed in a large, bold, blue, sans-serif font, centered at the bottom of the page.

The Agency of Design (Emerging Innovator)

The Agency of Design is a design consultancy helping organisations design a better future by re-thinking our physical and digital worlds.

Research areas of importance to the transition to a circular economy

- Service models and product ownership: Consumers will have a changing relationship with their products as they shift from ownership to access. This has a very dramatic impact on the design of products. This is an area that the agency is keen to explore further.
- All things design in the circular economy: The agency has a broad knowledge base and experience of designing products and services to fit circular models, but are always keen to expand this knowledge and test out new areas. They would be happy to engage in any design research around the circular economy.

- Connected technologies enabling circular business models: The agency has an active interest in web-connected products enabling service models and circular economy products.

Research projects planned in the short term

The Agency of Design will be developing their light bulb service over the next 12 months. This will involve researching and testing various elements from the above research list.

Typical relationships with academia

Formal research projects involving academia have not been undertaken before, but the agency has done various Technology Strategy Board projects that typically involve academics.

Contact details

Rich Gilbert
rich@agencyofdesign.co.uk

The Agency of Design

iFixit (Emerging Innovator)

iFixit is a global community of repair technicians and consumers who help each other fix things by sharing online repair instructions and know-how.

Research areas of importance to the transition to a circular economy

- Obstacles and inefficiencies in the repair ecosystem
- Analysis of design for disassembly.

Research projects planned in the short term

Developing a voluntary assessment tool that a product development team could use to evaluate their products. Green Electronics Council is facilitating the process,

publishing the product and providing (voluntary) independent assessment services. Since reparability can be measured many ways, an open approach will be taken to determine key metrics. One potential method is to estimate the cost to remove specific items that require repair or maintenance. Another is to call on the literature regarding time studies for disassembly. Another route is to use a set of heuristics based on the experience of iFixit and Dell engineers. The second method has the benefit of being generally applicable and not requiring a large database of time studies.

New experience can be incorporated into the procedure and the procedure revised as new design ideas emerge or new information is learned about the reparability of products.

Typical relationships with academia

- Collaborations

Contact details

Kyle Wiens
kyle@ifixit.com



Dragon Rouge (Company)

Dragon Rouge is a global design and innovation business. It helps brands and businesses to innovate and inspire people.

Research areas of importance to the transition to a circular economy

- How to maximise interest in new business models by introducing them in more desirable, understandable ways
- How to moving to a circular economy will affect the relationship between businesses, their brands and their customers - the changing nature of loyalty, trust and identity
- How moving to a circular economy will promote subjective wellbeing for society as a whole

Research projects planned in the short term

Follow on study from previous consumer research work with the CE100

Typical relationships with academia

- “Sporadically but enthusiastically”

Contact details

Nick Liddell
n.liddell@dragonrouge.com



SunPower Corp. (Company)

As a global solar energy solutions company and technology leader, SunPower designs, manufactures and delivers high efficiency solar solutions for homes, businesses and utilities.

Research areas of importance to the transition to a circular economy

- Material recycling/upcycling
- Reverse logistics
- Packaging reuse

Research projects planned in the short term

- Material recycling/upcycling

Typical relationships with academia

- Informal/formal partnerships
- Internships Etc.

Contact details

Marissa Yao
marissa.yao@sunpower.com

The SunPower logo features the word "SUNPOWER" in a bold, black, sans-serif font. The letter "O" is replaced by a stylized orange sun icon with a white center and a soft orange glow.

The Anaerobic Digestion and Biogas Association (ADBA) (Emerging Innovator)

ADBA is the trade association for the anaerobic digestion (AD) and biogas industry in the UK.

Research areas of importance to the transition to a circular economy

- Process optimisation:
Increasing gas yields, reducing retention time, microbiology & biochemistry
- Feedstock pre-treatment technologies
- Use of novel feedstocks such as algae and wild flowers for AD
- Life-cycle analyses of using different feedstocks for AD and comparisons against fossil fuels

- Integration of AD with other technologies to produce multiple products through biorefining
- Production of alternative gases such as hydrogen and high-value products
- Adding value to digestate
- Micro-scale anaerobic digestion
- Reuse of CO₂ in horticultural greenhouses
- Odour measurement and mitigation

Research projects planned in the short term

ADBA does not conduct R&D itself, but aims to coordinate between different research institutes and industry in order for them to conduct research.

Typical relationships with academia

The ADBA has 10 members from academia, as well as approximately 340 from industry.

Contact details

Ollie More (R&D Liaison)
ollie.more@adbioresources.org



Granta Design Ltd. (Company)

Granta Design is the leader in materials information technology: software and information resources that help engineering enterprises to make the best possible decisions about materials and processes.

Research areas of importance to the transition to a circular economy

Generally, Granta Design is interested in maximising effectiveness of tools to improve circularity in product design, including performance improvement and reducing environmental impacts. Specifically:

- Circularity indicators for product design
- Environmental, regulatory and supply chain risk for product design and product life management
- Restricted substances and conflict materials in products
- Improving performance and minimising cost while meeting business demands

Research projects planned in the short term

Practical approaches and tools for improving circularity in product design. Any other topic that links to management of data about materials, for example:

- Closed-loop manufacturing models and product systems

Product and asset tracking - looking at data infrastructures for product passport

Typical relationships with academia

Granta Design has worked closely with academia from the start of the company.

- Granta software and teaching resources are used to support courses in materials, sustainability and related topics at 1,000+ universities and colleges worldwide

- Direct collaborations with National Research Council Funds, such as Knowledge Transfer Partnership (KTP)
- Industry funds to transition academic research from the Technology Strategy Board (TSB) and European funding, such as FP6 & FP7 in the past, and now Horizon 2020 and Life+

Contact details

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To complement the Research Hot List, we have created the Higher Education Academic Profiles. This document provides key contacts from the Ellen MacArthur Foundation's academic network of Pioneer, Partner and Network Universities and aims to facilitate connections with members of the CE100 programme. The profiles highlight individuals and their areas of expertise within the circular economy enabling CE100 members to connect with them, and their institutions, to develop collaborations such as research programmes and training capabilities. See below to find out more about the Foundation's three interlinked higher education programmes:



PIONEER UNIVERSITIES

Higher education institutions entering the CE100 membership group with a formal agreement to further the collective understanding of the circular economy model through pioneering research and/or teaching programmes.



PARTNER UNIVERSITIES

Partner Universities are those involved in the Schmidt-MacArthur Fellowship — an international programme for postgraduate students and their university tutors with the aim to develop the skills and innovative thinking required to transition to a circular economy.



NETWORK UNIVERSITIES

Enabling collaborative ventures and knowledge exchange across policymakers, business and academia outside of the Foundation's formal programmes.

PRIORITY RESEARCH AGENDA

Based on our ongoing work with business and education networks we have been able to develop a **Priority Research Agenda**. The agenda offers a list of questions that are currently not fully understood (although initial hypotheses and partial answers may exist) and that would play an important role in implementing a circular economy or in strengthening the model itself.

We developed this Priority Research Agenda with the aim to provide stimulus for future research. This will be a living document, to be regularly updated as our understanding of the issues evolves.

The questions we identified fit into five themes:



Systemic methodology – nexus approach

Many connections link the various themes and issues relevant to the circular economy. What methodologies can help taking these interconnections into account?



The current landscape

What do we know about the linearity / circularity of the current economy? Can we create a repository of significant data?



Resource challenges

The economy is expected to face increasing resource challenges. How are these characterised?



The potential impact of a circular economy

Would a circular economy address upcoming resource challenges – and in what way? What other systemic challenges would circular economy help overcome?



Implementing a circular economy

What system conditions and initiatives would enable the transition to a circular economy?

SPACE FOR NOTES:

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Global Partners of the Ellen MacArthur Foundation:

