

DRAFT VERSION

APPROACH AND OBJECTIVES

The Ellen MacArthur Foundation has developed a Priority Research Agenda, based on its ongoing work with business and education networks. 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.

FIVE RESEARCH THEMES

The questions we identified fit into five themes:

1

Systemic methodology - nexus approach

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

2

The current landscape

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

3

Resource challenges

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

4

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?

5

Implementing a circular economy

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

1

SYSTEMIC METHODOLOGY - NEXUS APPROACH

How do you take into account all the interrelations between the various themes and issues relevant to circular economy? E.g.

- How do you approach the interrelations between the different types of resources?
- How do you approach the interrelations between different enabling conditions and individual initiatives?

2

THE CURRENT LANDSCAPE

What policies supporting circular practices are in place today, across geographies and industries?

What generates linear lock-in (e.g., regulation, sunk costs of companies)?

What business case studies are available?

Ideal case studies should

- Be detailed
- Show innovative product/value chain designs, business models, reverse treatment options
- Outline economics/profitability vs linear model
- Be generalizable
- Explore a range of sectors, including the lesser known ones (e.g. aerospace) and both low volume/high value and high volume/low value sectors

What data is available on materials flows? Could we consolidate them into one repository?

3

RESOURCE CHALLENGES

- Which resources are most critical to economic prosperity and growth¹? (e.g. energy, water, plastics, metals, land use,...)
- Which resources are currently most constrained – and in what way? How may this list evolve over the next 20 years?
- Where are the thresholds (e.g. of resource use, of extraction, of price) leading to disruptive consequences?
- What could these disruptive consequences be? In other words, what might happen as thresholds are reached?
- Which of these thresholds might we reach first? Can we build a dynamic dashboard evolving with the latest trends?

¹ This would require using a refined definition of economic performance, which might not be based on throughput.

4

THE POTENTIAL IMPACT OF A CIRCULAR ECONOMY

What would be the impact of a circular economy?

- **On the resource constraints?** E.g.,
 - Would a circular economy change the thresholds?
 - Would a circular economy keep us under the thresholds?
 - How would the circular approaches affect overall resource use over time?
 - On energy specifically: Will a circular economy help to enable the shift to renewable energy? What would an effective renewable energy system² look like (e.g. types of renewable energy, devolved vs centralised systems)?
 - What is the impact of pure material flows on RMC (Raw Material Consumption), waste generated, ... ?
- **On the value pool?** E.g.,
 - How do we measure success in this new economic model?
 - Would we end up in a better place from a macro-economic perspective? In other words, are we growing the overall pie or simply shifting value?
 - Would a circular economy enable an effective flow of income and contribute to economic revitalisation?
 - More specifically, what is the role of the sharing/performance economy in increasing the value pool?
- **On employment?** E.g.,
 - What is the net impact?
 - How will employment type (and needed skills) change?
 - How should educational approaches be modified to reflect the needed changes in skills and habits of thought?

For each type of impact:

- How does it vary by industry, geography, material flows (including emerging vs developed, variation in infrastructure, cultural and social differences)? Where do the biggest impacts happen?
- What are the key impact levers?
- What would the timing look like? What impacts would happen first? What would a transition and an advanced scenario look like?
- What may be some of the unintended consequences of transition approaches (e.g. consolidating material flows leading to the creation of material monopolies)?

² The study of renewable energy systems should be taking both supply and demand into account.

5

IMPLEMENTING A CIRCULAR ECONOMY

What are the overall enabling conditions?

- What systems conditions do we need in the long term (e.g. taxation, large-scale infrastructure)? In particular:
 - How will education and training need to change, both in terms of content and approaches, in a circular economy?
 - What are the impacts of specific legislative tools and their evolution through revision processes (e.g. EcoDesign Directive, Extend Producer Responsibility, WEEE)?
 - What enabling conditions can be put in place in a transition phase (e.g. financing, information technology, training)?
 - What actions would help overcome the linear lock-ins?
 - What is the effect of different enabling mechanisms in terms of magnitude of impact and time to impact?
- In particular, what is the role of Internet of Things across the lifecycle?
 - Tracking of products
 - Interactions – triggering actions (e.g. self repairing)
 - Mapping flows

How can an organisation support the transition to a circular economy?

- For a business, how to know what types of pathways (e.g. re-design, new business model) are most appropriate? How does it vary by geography, industry, product, or material?
- For a country or region, what are the rules, the cookbook, to support the adoption of circular practices?
- What is the long-term view? What can be done now or in a transition scenario?

What is the role of people (as citizens or in their relationship to the company)? E.g.,

- What will change for consumers in a circular economy (e.g. remanufactured products, access over ownership)?
- What will the main challenges be in developing attractive circular models and products (e.g. model is perceived negatively, such as less convenient or more costly; modifications in user behaviour lead to increased costs, such as less careful handling of product that are not owned)? How can they be overcome?
- What will the main enablers be (e.g. an existing trend, such as collaborative consumption; positively perceived attributes such as high quality products and services, affordability or local employment)? How can they be best leveraged?

How to measure and account for circular practices?

In other words, what is the 'function' to optimise for? E.g.

- What measure will inform design choices?
- How to best inform investors (degree of circularity, its benefits)?