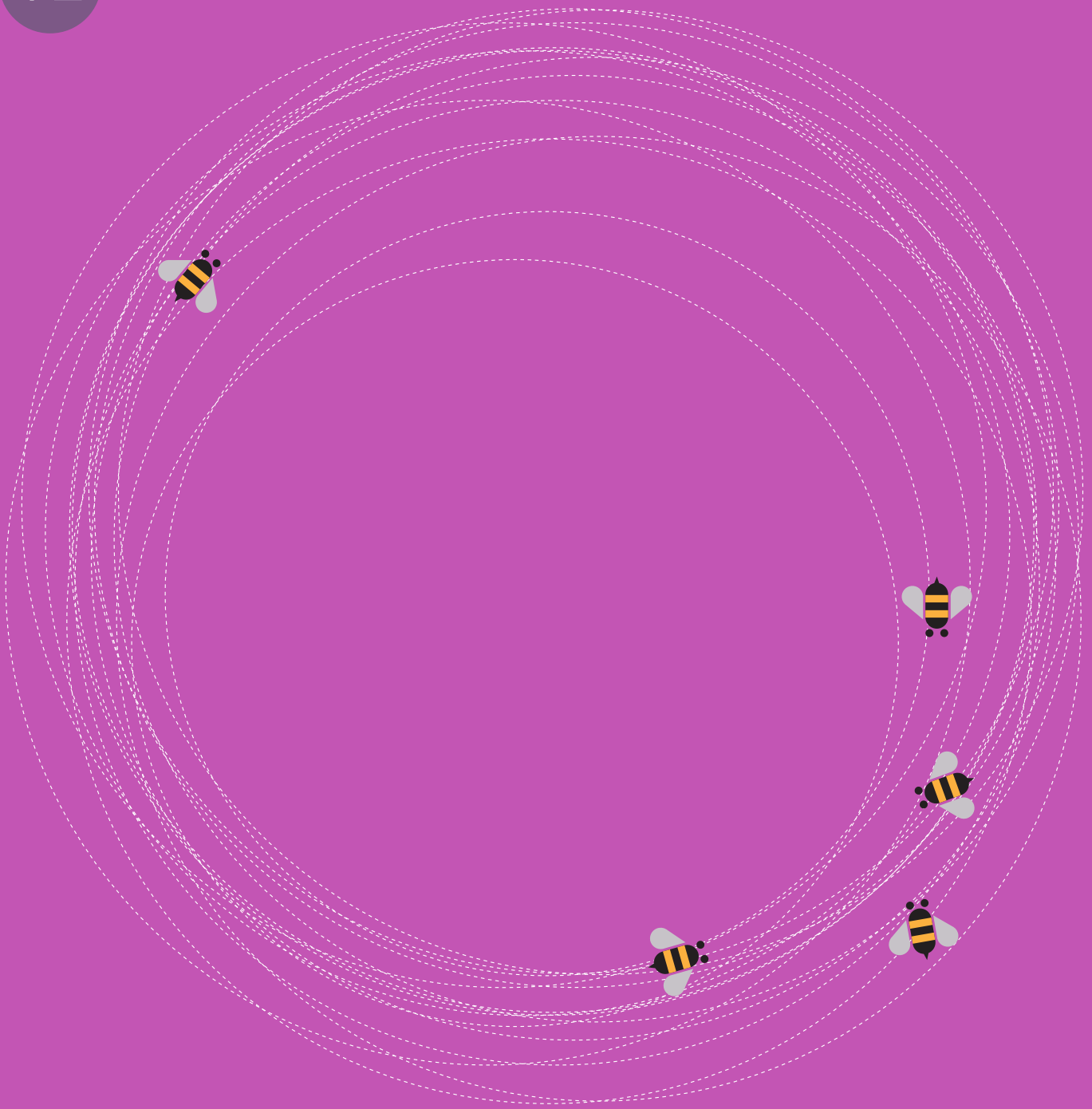
CIRCULAR ECONOMY IN ACTION

Interactive resources for professional development workshops

V2



ELLEN MACARTHUR FOUNDATION

CIRCULAR ECONOMY IN ACTION

Interactive resources for professional development workshops

V2

Ellen MacArthur Foundation in partnership
with Cranfield University, TU Delft, University
of Exeter and University São Paulo

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Version 2.00

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Front cover artwork: the bee ‘round’ dance. A forager honey bee that finds a rich food source transmits the location of the food source by dance communication at the nest. Nest mates follow the ‘dancer’ bee several times, decode the dance information and finally reach the indicated food source. Thus the dance is considered a miniature representation of the actual foraging trip.

INTRODUCTION

Intentionally, this publication is a work in progress. Trying to be true to the idea of iteration and feedback as keys to effective learning, we have published these workshop activities in a way that allows us to update the files online and incorporate your feedback. The project development team drafted these activities and piloted them in various professional development settings during 2016 /2017[1]. The main publication, available in digital format contains the basics: what the activities are designed to do; how to deploy the activities; and thumbnail size versions of the workshop resources. These resources are designed for print or PowerPoint use, since face to face workshops often use group work around images, graphics, objects, data and so on. All of these activities are designed for interactive workshops not information giving per se and none of them are intended to provide ready answers, or detailed briefings. Rather, they are to encourage participation, dialogue and perhaps reflection around moving forward…they are about asking the right questions.

The obvious point is that the workshop facilitator requires a good understanding of the background to the activity to enable an optimal experience in professional development settings. So, as well as the basics in this main publication, there is the project website where additional background and relevant facilitators guidance is provided - and where your feedback about using these activities can be left to assist the work of the originators of the activities. The project website also features the high resolution, downloadable workshop resources and has been designed to enable frequent updating of the activities - these may be changed and updated without prior notice.

Formally updated versions of activities carry numbering after the fashion of software upgrades. Tweaks are 1.00 1.01 1.05 etc. Substantial changes are 2.00 and so on.

The activities prompt questions across the spectrum of a broadly conceived notion of a circular economy. Questions such as: “What is the real problem we are trying to solve here?’’ Or “How far does this create value and where does it go?’’ “Does this create costs?’’ “Can there ever be a fully closed loop for materials?’’ Or “What would it take to make this business model successful?’’ “Is this about circularity as if it were a plumbing system, the aim is trying to stop leaks? Or is it about an ecosystem that is inherently ‘leaky but nutritious’?’’

1 See Appendix 1 for an example professional development workshop held with 30 academic staff at University of São Paulo, September 2016 - a selection of these activities were piloted at this event.

CIRCULAR ECONOMY

The circular economy is most often associated with materials and resources (energy) stocks and flows but this curriculum development project takes its cue from Kenneth Boulding who argued that an economy should be seen as composed of knowledge/information, materials and energy. This includes conventional economic information around money, markets, prices and costs.

The circular economy is part of a contemporary debate about the boundaries and role of economics; it uses the idea of an embedded economy, one which exists in the context of dynamic, interdependent social and environmental systems as its starting point. It is in contradistinction to a linear 'take-make-dispose' economy; one which degrades natural and social capital, and one that is so evident today. From a systems perspective, a circular economy explores, amongst other things, the design of products, components and materials. And of course it explores the systems within, which can be integrated in a way which are regenerative and restorative to natural and social capital - as a way of creating additional value. As such, the ideas of stocks, flows and feedback and understanding the context, and consequences of any economic activity are both vital, and obvious.

Characterised as an umbrella concept, the circular economy tends to use creative and critical thinking that involves the bigger picture, the longer term, all scales, and dynamic, not static, equilibrium. Thus it is part of a shifting 'worldview' based on contemporary science which has been underway for many decades - a circular economy, at its best and most effective, shares in that 'framework for thinking'. This is a compelling reason for designing these activities and their resources, primarily, around workshops. It is, surprisingly, not the relative novelty of circular economy which is problematical here. As economist John Maynard Keynes wrote:

"The difficulty lies, not in the new ideas, but in escaping from the old ones, which ramify, for those brought up as most of us have been, into every corner of our minds.''

Workshops in a 'feedback rich' setting are often based around challenges, creating uncertainty, raising doubts and facing contradictions or inconsistencies in our minds as one way of loosening these habits of thought. The old ideas are so embedded that merely being informed of some new, if startling facts will make little or no difference. Process and context together can be fruitful, drawing in knowledge as required. Kenneth Boulding again: "Theories without facts may be barren, but facts without theories are meaningless." We would add: learning without understanding is ephemeral.

A visual representation of the notion of a circular economy is shown in Figure 1. For a broader discussion on circular economy origins, definitions and criticisms see the review paper by Vasileious Rizos and colleagues (Rizos et al, 2017).

FIGURE 1

A REGENERATIVE CIRCULAR ECONOMY

can be seen as the effective flow of materials, energy and information in relation to maintenance or increase of stocks of capital: ECONOMIC, SOCIAL, HUMAN AND NATURAL

- **It uses insights from the functioning of non-linear systems – feedback-rich systems, and especially living systems – as a framework for thinking**
- **Its study is likely to have in mind nested systems (fractal scale, diverse periodicities) with histories and entrainment but also emergent properties and the possibility of evolution**
- **Characterisation: the bigger picture, the longer term and by intention (design)**

- **The circular economy can be explored through a number of identities and one related shift. In a circular (feedback-rich) system the endless transformation means that one side of the equation has an intimate relationship with the other if it is to 'work' optimally as a system**
- **Using the three categories of materials, energy and information and informed by systems thinking, the four identities fall into place**

Source: Webster, 2017

THE WORKSHOP ACTIVITIES AND USE OF TWO COMMON TEMPLATES

The template below in box 1 fits a PowerPoint slide or handout and could be used by the facilitator to introduce a particular activity. This 'introductory template' carries basic information about the context, (suggested) resources to use, tasks and timings.

Perhaps unusually, the template for introducing the workshop activity does not include the overall aims of the exercise. The rationale for this approach to the introductory PowerPoint slide or handout is for the facilitator not to cue the actual outcome from the beginning of the session. The general aim, detailed facilitators guidance notes, downloadable high-resolution resources, references and further reading for each activity are in the online support material as indicated in the template in box 2.

BOX 2

TEMPLATE FOR THE ONLINE RESOURCES

Context for the activity: Some detail on the arena of the discussion and its relationship to circular economy

Aim of the activity: Suggested aim and possible outcomes of the activity

Guidance for facilitators including debriefing notes: Written from the point of view of a facilitator needing to be equipped for creating as well as managing/shaping the session effectively

Possible extension or alternative activity: Optional category

Supplementary resources: Two or three additional resources to compliment the main activity resources e.g. as handouts during debrief or at the end of the activity

References and further reading: Both specific to the activity and generally relevant

Downloadable resources: This section on the website contains the high resolution, downloadable resources for use by the facilitator

User suggestions: Moderated at the project website following publication of version 2.00

BOX 1

Activity title/number ELLEN MACARTHUR FOUNDATION

INTRODUCTORY POWERPOINT SLIDE

- **Activity title/number:** Available on all guidance, resources and supplementary material. No significance is attached to lower or higher numbers
- **Key enquiry:** One line only on the arena of the discussion and its relationship to circular economy
- **Task(s) and timings:** The nature and the sequence of the workshop activities – timings are important but will vary according to circumstances. Timings left blank but as a reminder for the facilitator to issue this guidance.

OUTLINES OF THE WORKSHOP ACTIVITIES

A SANDWICH, A BUTTERFLY AND A CAKE! - A CIRCULAR ECONOMY?: to give an early introduction to the circular economy overall. This activity emphasises the importance of 'big picture' – of science, design, business and setting system conditions. It is based the idea of an economy as material, energy and information stocks, flows and feedback.

MATERIALS FLOWS, THE BIG PICTURE: this activity is based around interrogating four stimuli: a photo of an aluminium smelter; material losses associated with smelting, a sankey diagram of aluminium flows; and a graphic used by Walter Stahel to illustrate what happens to resources used in an aluminium can over several cycles. The theme of the session is 'big picture' flows and iteration (the consequences of feedback in different contexts). Can aluminium be 'closed-loop'? When, if at all? How? Does it matter?

EXPLORING SYSTEMS DYNAMICS - A SIMULATION: this activity considers how complex adaptive systems behave when the 'rules of the game' are changed. The simulation enables and enriches a discussion of the key characteristics of complex systems such as interconnectedness, compound causality, tipping points and phase transitions, resilience and 'dynamic equilibrium'. This experience of the abstract model can then be applied to (the transition to) a circular economy, deepening consideration of stocks, flows, feedback and change in general.

THREE STORIES ABOUT SCALE, SELLING AND ACCESS OVER OWNERSHIP: can many of the problems associated with economies of scale and selling to consumers be fixed by smaller scale and shifting to use - to 'access over ownership? What happens if access over ownership is separated from circular flows of materials and is short term?

NANO MEMBRANE TOILET – THROUGH 4 LENS OF CIRCULAR DESIGN: this activity puts into context the overarching dimensions of design thinking and circular economy needed to create a new mind set for design. It is based on understanding 'four lenses' of circular design. A 'lab story' from Cranfield University is used to prompt discussion on how we can re-think great inventions such as the toilet. The context is Cranfield University's Nano Membrane Toilet which will be able to treat human waste on-site without external energy or water. There is a huge opportunity to create new mind sets for design to reinvent current structures and create regenerative systems that are accessible to all.

THE CIRCULAR ECONOMY IS IN THE CARDS: in order to achieve a complete circular business model, we need a systems change and wide collaborations across companies, sectors and regions. This activity encourages reflection on how, through different combinations, these circular business model components might affect material flows and/or product and component utilisation across the value chain. In this session, up to five guiding questions are offered to facilitate the discussion.

VALUES IN A CIRCULAR ECONOMY: the circular economy appears to offer a positive systemic model or framework for addressing some of the serious global and local economic and wider societal challenges confronting us in the 21st century – in ways that make sense. But, in reality, everybody understands and deals with a circular economy in a different way. The roots of these differences often lie in our personal values. This activity helps to clarify differing personal interpretations of a circular economy.

A DOUGHNUT FOR LATER?: this activity is based on understanding Kate Raworth's two different approaches to thinking about economics - and their roots. But, as importantly, this activity helps reflection on the question: how far is the circular economy a materials and resources fix for the existing economy or is it part of not just a transition but a transformation in how we see the economy and what we expect from it? Or, indeed, can it be both - it is only time that separates the two? The answer to these questions matters because it informs the kind of 'system conditions' or 'rules of the game' which need to be applied to advance change.

CIRCULAR BUSINESS MODELS – THE BRANDED T-SHIRT CASE: this activity introduces workshop participants to the creation of a circular value proposition using the four building blocks, and gives hands-on experience of the challenge of re-designing a current real linear sales/ownership/dispose model to a potential circular model. The case involves cotton T-shirts and raises issues about the disposal of valuable product and materials well before economic, biological and technical life spans - a common issue in circular analysis.

COFFEE PRODUCTION AND CONSUMPTION SYSTEMS: this activity emphasises how, in the biological cycle, the circular economy is about value creation/ distribution and regeneration of natural and social capital through biological materials cascading and approaches such as business 'enterprise stacking'. This workshop activity uses the coffee production and consumption system as a context to explore the notion of Knowledge+ (biological) Waste = Asset (multiple assets through 'cascading'). Discussion in this session is on coffee production at the farm level but includes extension work around coffee consumption and coffee 'waste' cascading within cities.

References

Boulding, K. (1985) *The world as a Total System.* Sage

Rizos, V. Tuokko, K. and Behrens, A. (2017) The Circular Economy A review of definitions, processes and impacts. *CEPS Research Report* No 2017/08, April 2017

Webster, K. (2017) *The Circular Economy – a wealth of flows.* 2nd edition. Ellen MacArthur Foundation

ACTIVITY

01

A SANDWICH, A BUTTERFLY AND A CAKE! - A CIRCULAR ECONOMY?

WHAT ARE THE BOUNDARIES TO A CIRCULAR ECONOMY?

OUTLINE

To give an early introduction to the circular economy overall. This activity emphasises the importance of 'big picture' – of science, design, business and setting system conditions. It is based the idea of an economy as material, energy and information stocks, flows and feedback. Links with the activity A doughnut for later?

RESOURCES AVAILABLE

- 1:R1a Intro PPT slide
- 1:R1 PPT build up in stages of a 'circular economy'
- 1:R2 Card prompts – 6 items, one blank
- 1:R3 PPT 'A sandwich, a butterfly and a cake' proposal

ORGANISATION

- Plenary and dialogue around PPT
- Small group (4s) around card prompts
- Plenary debrief

TASK(S) AND RUNNING ORDER

1) Dialogue around classic 'circular economy' diagram build up.
Why does it matter? Is it sufficient?

2) Consider in groups the 1:R/2 cards.
Categorise them as 'very relevant', 'perhaps relevant', 'marginal' to CE.
Add own item(s)

3) Feedback and debrief on the cards

4) Dialogue around 1:R/3 short slide set

5) Reflection: 'Where do CE boundaries lie for you?'

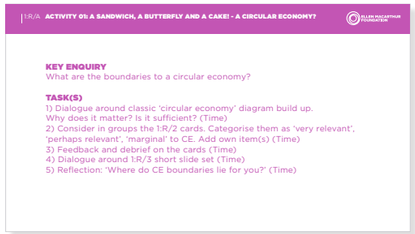
TIMINGS

Overall approximately 85 minutes.
Task 1: 15 mins; Task 2: 20 mins; Task 3: 20 mins; Task 4: 15 mins; Task 5: 15 mins.

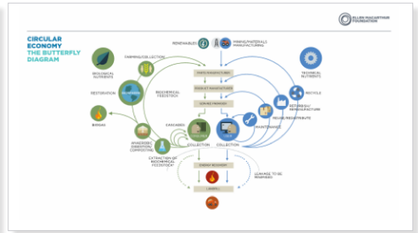
THUMBNAIL RESOURCES

DOWNLOAD HIGH RESOLUTION VERSIONS FROM WEBSITE

1:R1a INTRO PPT SLIDE

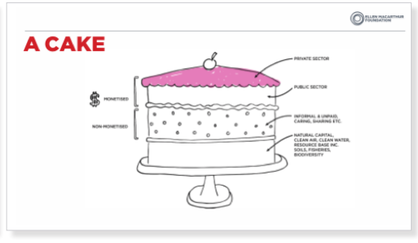


1:R1 PPT



1:R2

1:R3 PPT



ACTIVITY

02

MATERIALS FLOWS, THE BIG PICTURE

COULD ALUMINIUM USE BE ‘CLOSED-LOOP’?

OUTLINE

The theme of this activity is ‘big picture’ flows and the consequences of feedback in different contexts. Can aluminium use be ‘closed-loop’? When, if at all? How? Does it matter? The main stimulus for this activity is a Sankey diagram that visualises the stocks and flows of aluminium internationally. Aluminium is a very significant metal in the global economy and in the discussion, participants are encouraged to reflect on ways to improve the prospects for aluminium in relation to creating more ‘circularity’.

RESOURCES AVAILABLE

- 2:R1a Intro PPT slide
- 2:R1 Photo of an aluminium smelter
- 2:R2 A Sankey diagram of aluminium flows
- 2:R3 A graphic to illustrate what happens to resources used in an aluminium can over several cycles
- 2:R4 Aluminium prices
- 2:R5 Aluminium flows - cars

ORGANISATION

- Small group (2-3) discussion around aluminium datasets
- Larger group (4-6) discussion on aluminium and ‘circularity’

TASK(S) AND RUNNING ORDER

1) In small groups develop dialogue around the aluminium smelter photograph and Sankey diagram

2) Consider in groups the graph about recycling and aluminium cans

3) Reflection: where would your emphasis go in improving the prospects for aluminium in relation to creating more ‘circularity’?

TIMINGS

Overall approximately 60 minutes.

Task 1 /2: 40 mins. Task 3: 20 mins.

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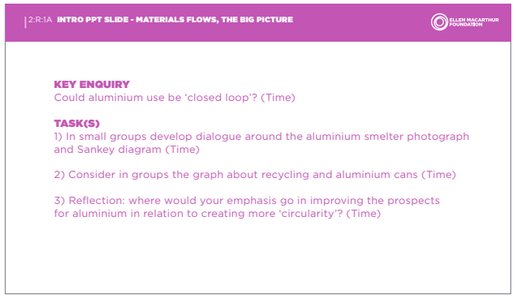
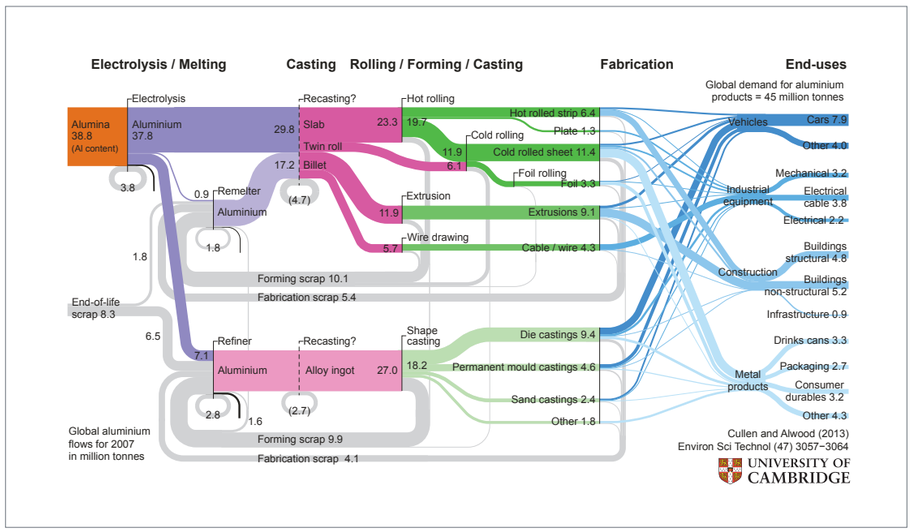
2:R1a INTRO PPT SLIDE

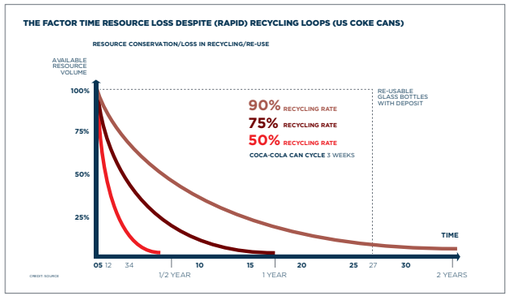


2:R1

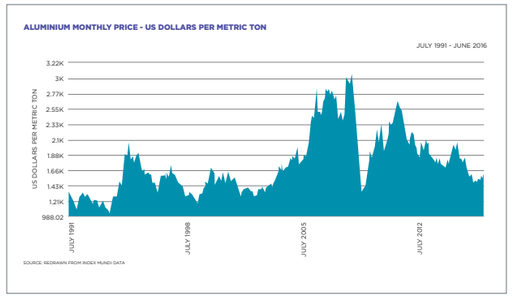
2:R2



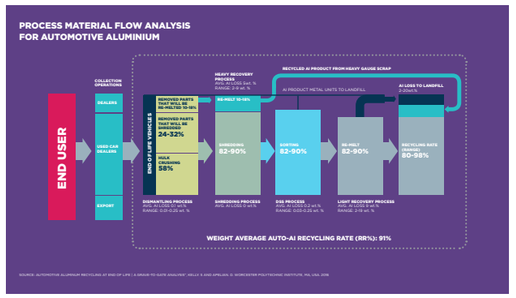
2:R3



2:R4



2:R5



ACTIVITY

03

EXPLORING SYSTEMS DYNAMICS – A SIMULATION

HOW DO COMPLEX ADAPTIVE SYSTEMS BEHAVE WHEN ‘RULES OF THE GAME’ ARE CHANGED?

OUTLINE

To provide an experience of how complex adaptive systems behave. This simulation enables and enriches a discussion of their key characteristics such as interconnectedness, compound causality, tipping points and phase transitions, resilience and ‘dynamic equilibrium’. This experience of the abstract model can then be applied to (the transition to) a circular economy, deepening consideration of stocks, flows, feedback and change in general.

RESOURCES AVAILABLE

- 3:R1a Intro PPT slide
- Stickers with numbers written on them (1-20 or however many members the workshop group has). A minimum of 5 people is advisable. There is no upper limit
- Flipchart paper on a stand or whiteboard, with pens
- An open space large enough for the group to form a circle with one metre between each individual

ORGANISATION

Whole group activity. If there are more than 20 participating, split the group into ‘participants’ and ‘observers’. A small number of these observers can assist the facilitator by watching the progress of the activity and helping with the debriefing.

TASK(S) AND RUNNING ORDER

1) Arrange the group into a large circle. Each person secretly decides on two other individuals whom they will ‘follow’. Everybody begins to move to form an equilateral triangle with the two people they ‘follow’.

2) Remove one person from the whole group. Group moves around again. Debrief.

3) Change one of the ‘rules of the game’. Group moves again. Second debrief.

4) Reflect on the interconnected nature of the group.

TIMINGS

Overall approximately 45-60 minutes.

THUMBNAIL RESOURCES

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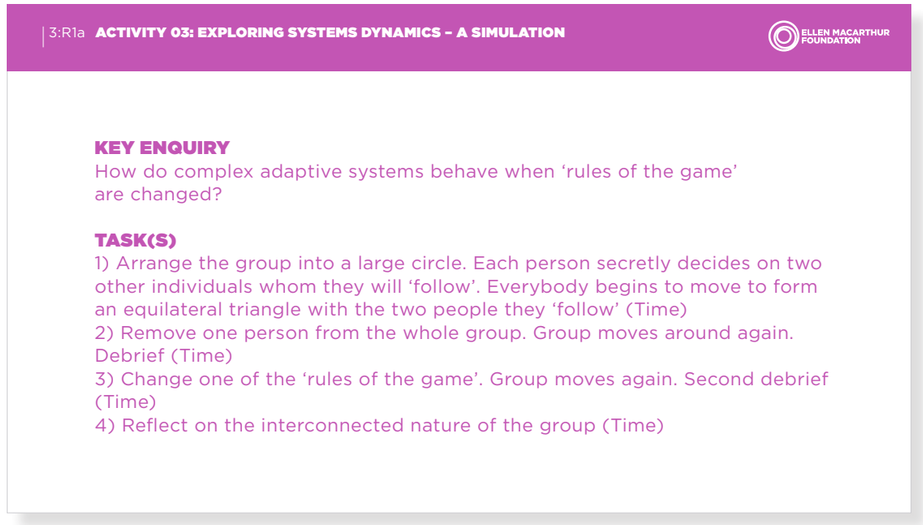
3:R1a INTRO PPT SLIDE



ACTIVITY

04

THREE STORIES ABOUT SCALE AND SELLING

CAN THE THINKING BEHIND A CIRCULAR ECONOMY BREAK THE TYRANNY OF ‘SCALE AND SALE’? OR DID DIGITAL DO THAT?

OUTLINE

In this activity the consequences of operating at scale are unpicked as a largely systemic driver of a linear economy. The logic which follows from ‘defeating’ both ‘scale and sale’ through higher utilisation of significant durables via a product as service model might be one key to being “at home in a modern world”. A case study of the innovative car company Riversimple is used to illustrate the possibilities and challenges. Lastly, the question of user protection is raised. How can shifting from ownership to use reflect not just resource benefits, but improve the rights of users? c.f. those conferred by ownership.

RESOURCES AVAILABLE

- 4:R1 PPT Intro slide and Sequenced slide set - ‘Selling and scale’ and its consequences
- 4:R1a ‘Selling and scale’ summary slide
- 4:R2 PPT Sequenced slide set - Defeating ‘Selling and scale’ by servicisation
- 4:R2a Defeating Selling and scale summary slide
- 4:R3 PPT Riversimple case study - slide set
- 4:R3a Riversimple business model - 2 visuals
- 4:R4 Riversimple video clip - 8 minutes in length

ORGANISATION

Presentation R1 with input as it proceeds - plenary
Presentation R2 with discussion at the end
Presentation R3 (case study) with video clip
Small group work and plenary debrief

TASK(S) AND RUNNING ORDER

1(a) Introduction, how an industrial production system brings benefits (see Context)

1(b) Presentation and discussion with R1 PPT. The consequences of selling at scale discussed. Systemic cause of economic growth and resource and other related issues (externalised costs)

1(c) Presentation and discussion with R2 PPT. What happens when extended product life and higher utilisation replace ‘sale and scale’?

2) Riversimple story and film clip R3 PPT, R3a and R4. Example of thoroughgoing rethinking of production and business model to critique argument made in 1(c). Is it convincing?

3) Zooming out. Small group work around what might be needed to allow people to be comfortable and secure around giving up ownership for access in various forms

TIMINGS

Overall approximately: 75 minutes. Task 1 a-c: 20-25 mins; Task 2: 20-25 mins; Task 3: 20-2 mins

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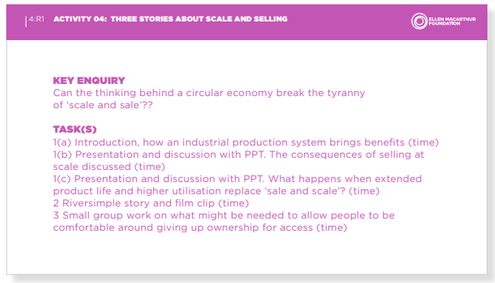
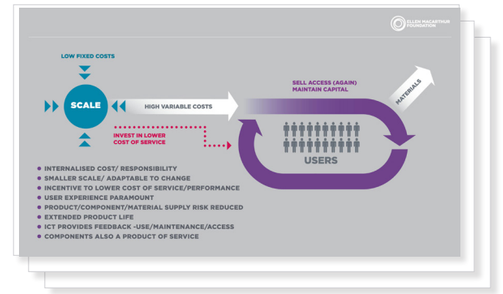
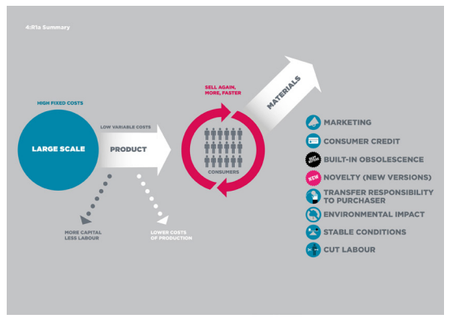
4:R1 Intro PPT slide and Sequenced slide set - ‘Selling and scale’ and its consequences



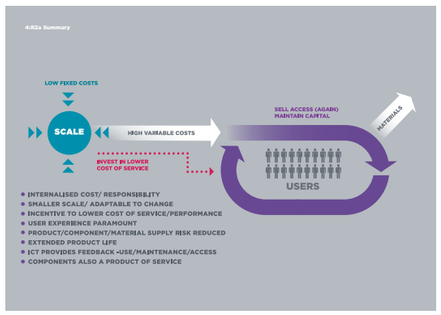
4:R1 Intro PPT slide and Sequenced slide set - ‘Selling and scale’ and its consequences



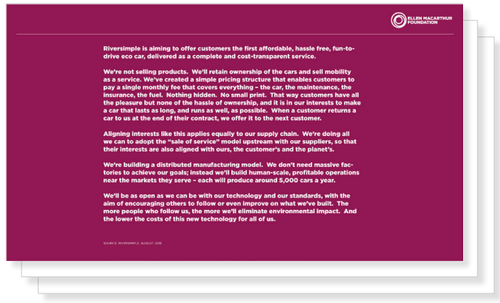
4:R1a ‘Selling and scale’ summary slide



4:R2a ‘Defeating selling and scale’ summary slide



4:R3 PPT Riversimple case study - slide set



4:R4 Riversimple video clip

4:R3a Riversimple business model - 2 visuals

ACTIVITY

05

NANO MEMBRANE TOILET - THROUGH FOUR LENSES OF CIRCULAR DESIGN

WHAT ARE THE DIMENSIONS OF CIRCULAR DESIGN?

OUTLINE

This activity puts into context the overarching dimensions of design thinking and circular economy needed to create a new mindset for design. It is based on understanding ‘four lenses’ of circular design. A ‘lab story’ from Cranfield University is used to prompt discussion on how we can re-think great inventions such as the toilet. The context is Cranfield University’s Nano Membrane Toilet which will be able to treat human waste on-site without external energy or water. There is a huge opportunity to create new mindsets for design to reinvent current structures and create regenerative systems that are accessible to all.

RESOURCES AVAILABLE

- 5:R1a Intro PPT slide
- 5:R1 PPT explaining the four lenses of circular design
- 5:R2 Lab Story video - interviews with research team members (20 mins running time). See Thumbnail page opposite for the download.
- 5:R3 Video story board card prompts - excerpts of the R2 video interviews
- 5:R4a and R4b A4 sheets for note taking and Card prompts with key questions about the four lenses of circular design
- 5:R5 Illustration of the Nano Membrane Toilet system configuration
- 5:R6 Full transcript of the video
- 5:R7 Diagram of a conventional sanitation system from Sanitation in the Circular Economy report

ORGANISATION

- Plenary and dialogue around PPT and the Lab Story video
- Small groups (4s) around Resource prompts R3 to R5
- Plenary debrief

TASK(S) AND RUNNING ORDER

1) Dialogue around the PowerPoint R1. Why is it important to provide a reference point to circular design through these four lenses? What are the overarching elements of design thinking, systems thinking and circular economy that are important to create new mind sets for design?
2) Play the ‘Lab story’ video.
3) Use the video to discuss in small groups how each of the four lenses is considered in the design of the nano membrane toilet.
4) Feedback and debrief from each group to the plenary.
5) Plenary reflection: what other dimensions do we need to consider when creating new mind sets for design?

TIMINGS

Overall approximately 140 minutes. Task 1: 20 mins; Task 2: 20 mins; Task 3: 60 mins; Task 4: 20 mins; Task 5: 20 mins.

THUMBNAIL RESOURCES

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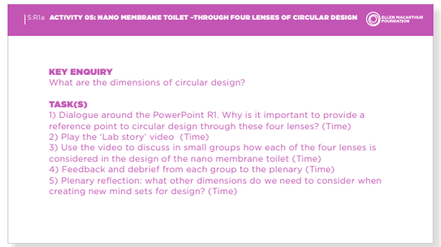
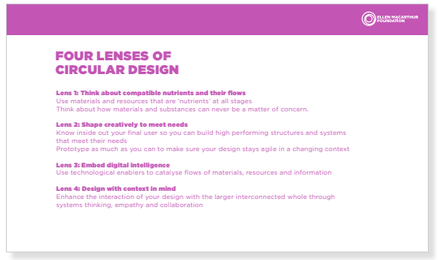
5:R1a Intro PPT slide



5:R2 Lab Story video - interviews with research team members

5:R1 PPT explaining the four lenses of circular design



5:R3 Video story board card prompts - excerpts of the R2 video interviews


CRAIG TO ROSS:
WHAT'S THE BACKGROUND ON TYPICAL TOILET AND SEWAGE SYSTEMS IN LOW INCOME SITUATIONS IN CITIES? SO WHAT'S THE CHALLENGE FOR YOUR NANO MEMBRANE TOILET SYSTEM?
ROSS:
The whole project started because two and a half billion people don't have a toilet around the world. The choices for them to use are, in the majority of developing countries, pit latrines, public toilets. And these are the toilets that you kind of have nightmares about, they're horrible. There's just an open pit, very unsafe, flies are a big problem and the spread of disease is pretty rampant. And that's why there's around 1.5 million people per year just from, basically, lack of sanitation. So, what we're trying to do is work on a new system, which is going to be able to be in the person's home. And it's a self-contained unit. It doesn't rely on plumbing or sewage, or water, which is why the conventional toilet is so challenging. It back for so many years... infrastructure's incredibly difficult.
CRAIG TO ROSS:
WHAT'S THE PROCESS OF YOUR WORK ON THE NANO MEMBRANE TOILET?
ROSS:
The focus of this project is the device which we are developing at Cranfield. It's a collaboration with the Bill & Melinda Gates Foundation and it's one of the pathways we're all researching the futures. So the vision, like it just said there, is a self-contained unit that's in the home with sensible processes in the household.
CRAIG:
Let's assume all the games coming out. So if you look at a typical 5 litre a per person, which is actually nothing on the composition of hydrogen, CO2, CO2 and methane, which is the gases that are in there. So we're trying to, as a business, to do a study to observe that the gas coming out of the unit is clean.
CRAIG TO ROSS:
THE BEAUTY OF THE CONVENTIONAL TOILET IS THAT IT WORKS WELL IF YOU'RE CONNECTED TO WATER AND PLUMBING, BUT WITH LIMITED WATER SUPPLY THAT BECOMES A PROBLEM?
ROSS:
I'm sorry to say, I'm a bit of a realist, I'm not going to lie to you, I'm not going to sugar coat it. It's not going to be easy, that's about [00:00:30] ... and that's why there's a lot of people working on it. And there's a lot of people working on it around the... I mean, so there's also our getting collaborations with universities in Loughborough in Leeds and Manchester and Leicester.
CRAIG TO ROSS:
WHAT'S GOING ON IN THE TOILET PRODUCTION CHAMBER?
ROSS:
In this combustion chamber, we're going to be able to manage the temperature. We're going to be able to manage the pressure. We're going to be able to, to, to,

ACTIVITY

06

THE CIRCULAR ECONOMY IS IN THE CARDS

WHAT DOES IT TAKE TO ACHIEVE A CIRCULAR BUSINESS MODEL?

OUTLINE

Analysis points towards the fact that there's not one single approach to embed circular economy in the business model, and there's no fully circular business model example out there. In order to achieve a complete circular business model, we need a systems change and wide collaborations across companies, sectors and regions. This activity encourages reflection on how, through different combinations, these circular business model components might affect material flows and/or product and component utilisation across the value chain. In this session, up to five guiding questions are offered to facilitate the discussion.

RESOURCES AVAILABLE

- 6:R1a Intro PPT slide
- 6:R1 18 double-sided cards with business models components + examples
- 6:R2 PPT and R2a Slides and cards with Five Guiding Questions.
- 6:R3 Circularity and nine 'Rs'

ORGANISATION

- Small groups between 2-5 people in each group
- Large board or wall space for presentation of small group card collections

TASK(S) AND RUNNING ORDER

1) Background and presentation of the session.
Presentation of the cards. Select 2/3 of the 5 Guiding Questions
1a) Participants to familiarise themselves with the card deck (R1)
2)Small group discussion
3) Feedback and debrief from each group to the plenary.
3) Plenary debrief. 15 minutes feedback to the room and discussion

TIMINGS

Overall approximately 80 minutes. Task 1: 10 mins; Task 1a: 5 mins; Task 2: 45 mins; Task 3: 20 mins.

THUMBNAIL RESOURCES

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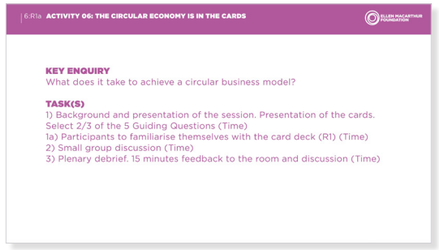
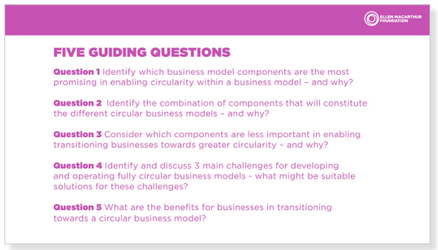
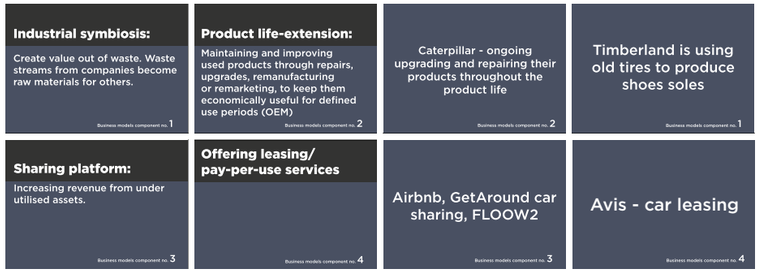
6:R1a Intro PPT slide



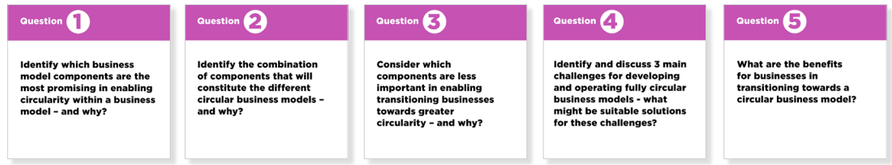
6:R2 PPT slide with Five Guiding Questions



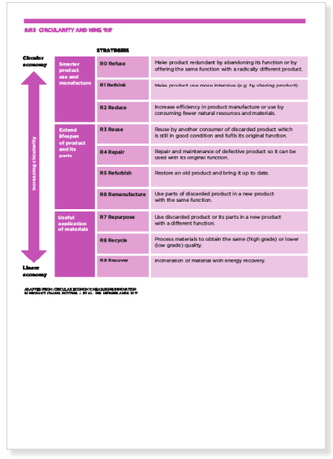
6:R1 18 double-sided cards with business models components + examples



6:R2a Cards with Five Guiding Questions



6:R3 Circularity and nine 'R's



ACTIVITY

07

VALUES IN A CIRCULAR ECONOMY

WHAT DOES THE NOTION OF A ‘CIRCULAR ECONOMY’ MEAN TO YOU? AND WHY?

OUTLINE

The emergence of the circular economy and the opportunities it presents have captured the interest of business leaders motivated by profit and business resilience, closely followed by policy makers, academics and educational leaders. The circular economy appears to offer a positive systemic model or framework for addressing some of the serious global and local economic and wider societal challenges confronting us in the 21st century – in ways that make sense. But, in reality, everybody understands and deals with a circular economy in a different way. The roots of these differences often lie in our personal values. This activity helps to clarify differing personal interpretations of a circular economy.

RESOURCES AVAILABLE

- 7:R1a Intro PPT slide
- 7:R1 Ten discussion cards
- 7:R2 One interpretation of a circular economy

ORGANISATION

- Plenary for introduction and briefing
- Small groups (6-8) around card prompts
- Plenary debrief

TASK(S) AND RUNNING ORDER

1) Plenary briefing by the facilitator and split up in groups of ideally 6-8 participants

2) Discussion using the cards. Take about 15 minutes per card. Pick a new card when the discussion could benefit from new input again. In the wrap up, ask the groups to write down three main ‘takeaways’ from their discussion and bring these statements to plenary

3) In a plenary debrief, cluster and elaborate on the group feedback

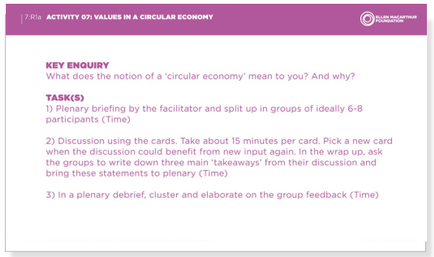
TIMINGS

Overall approximately 60 minutes. Task 1: 5 mins; Task 2: 40 mins; Task 3: 15 mins.

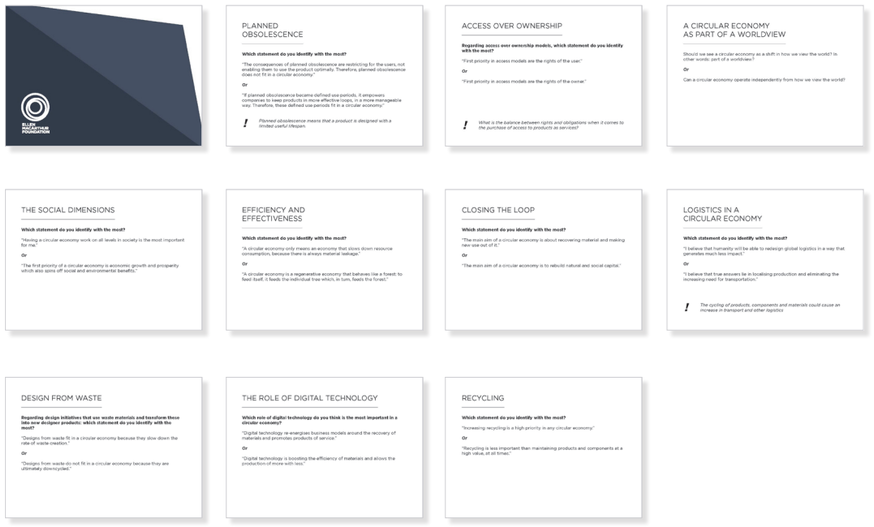
THUMBNAIL RESOURCES

DOWNLOAD HIGH RESOLUTION VERSIONS FROM WEBSITE

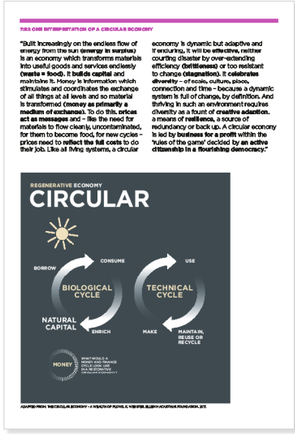
7:R1a Intro PPT slide



7:R1 Ten discussion cards



7:R2 One interpretation of a circular economy



ACTIVITY 08

A DOUGHNUT FOR LATER?*

CIRCULAR ECONOMY: PART OF A CHANGED PERSPECTIVE OR A PRACTICAL RESOURCES FIX? CAN IT BE BOTH?

OUTLINE

The activity is based on understanding Kate Raworth's two different approaches to thinking about economics - and their roots. But, as importantly, this activity helps reflection on the question: how far is the circular economy a materials and resources fix for the existing economy or is it part of not just a transition but a **transformation** in how we see the economy and what we expect from it? Or, indeed, can it be both - it is only time that separates the two? The answer to these questions matters because it informs the kind of 'system conditions' or 'rules of the game' which need to be applied to advance change.

RESOURCES AVAILABLE

- 8:R1a Intro PPT slide
- 8:R1 The circular economy – a description (as evidenced widely)
- 8:R2 Large flip chart or presentation screen with core R1 messages and room to annotate
- 8:R3 PPT on 20th century economic thinking (sequenced slide set)
- 8:R4 Kate Raworth animations: Design to distribute; Change the goal - aim for the doughnut; Be agnostic about growth
- https://www.kateraworth.com/animations/
- 8:R5 PPT builds out into Kate Raworth's 21st century economic thinking (sequenced slide set)
- 8:R6 Summary diagram of 20th and 21st century economic thinking (modified and annotated)

ORGANISATION

- Small group discussions on a circular economy description
- Plenary and dialogue around two PPTs

TASK(S) AND RUNNING ORDER

1) Small group discussions on a circular economy description
2) Plenary discussion about the circular economy description. Followed by PowerPoint presentation (R3) about 20th century economic thinking (sequenced slide set)
3) PowerPoint presentation (R5) about Kate Raworth's 21st-century economic thinking (sequenced slide set)
4) Final plenary using the last slide of PowerPoint R5 to prompt discussion on whether circular economy is part of a changed perspective or a practical resources fix... or both.

TIMINGS

Overall approximately 70 minutes. Task 1: 15-20 mins after personal reading time of 3 mins; Task 2: 15 mins; Task 3: 10-12 mins for PPT 5 (plus optional 3x animations – 6 mins); Task 4: 15-20 mins.

* The reference in the title is to the 'sandwich and cake' analogy used in Activity 1. It is a further exploration, a snack for later.

THUMBNAIL RESOURCES

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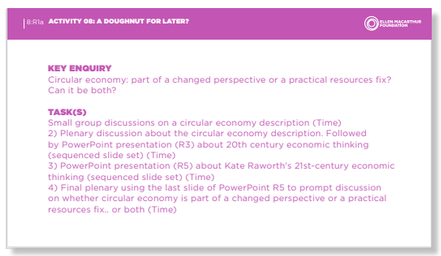
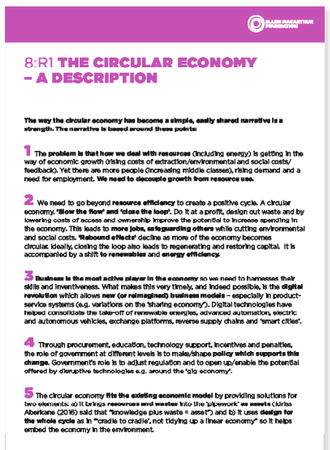
8:R1a Intro PPT slide



8:R1 The circular economy – a description (as evidenced widely)



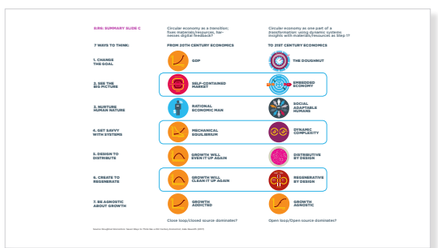
8:R2 Large flip chart or presentation screen with core R1 messages and room to annotate

8:R3 PPT on 20th century economic thinking (sequenced slide set)

8:R4 Kate Raworth animations: Design to distribute; Change the goal - aim for the doughnut; Be agnostic about growth

8:R5 PPT builds out into Kate Raworth's 21st century economic thinking (sequenced slide set)

8:R6 Summary diagram of 20th and 21st century economic thinking (modified and annotated)



ACTIVITY

09

CIRCULAR BUSINESS MODELS - THE BRANDED T-SHIRT CASE

HOW CAN WE USE THE CIRCULAR ECONOMY BUILDING BLOCKS TO CONSTRUCT AND MODEL CIRCULAR VALUE PROPOSITIONS?

OUTLINE

The starting position in this activity is that in order to move from linear to circular requires the deployment of a set or configurable actions known as ‘circular economy building blocks’. This activity introduces workshop participants to the creation of a circular value proposition using the four building blocks, and gives hands-on experience of the challenge of re-designing a current real linear sales/ownership/dispose model to a potential circular model. The case involves cotton T-shirts and raises issues about the disposal of valuable product and materials well before economic, biological and technical life spans - a common issue in circular analysis.

RESOURCES AVAILABLE

- 9:R1a Intro PPT slide
- 9:R1 PPT slide set: T-shirts, building blocks and business models
- 9:R2 Setting the scene
- 9:R3 Value creation and waste in T-shirt linear value chain
- 9:R4 The product design problem: the T-shirt branding issue
- 9:R5 The heart of the circular business model: prerequisites for capturing the value opportunity profitably
- 9:R6 Summary table of six clothing re-use or product extension models
- 9:R7 Background on textile/clothing disposal in UK to set the scene and the issue of T-shirts/Student unions in particular

ORGANISATION

- This workshop activity will benefit if the facilitator can collect and bring along a selection of T-shirts with varying colours, designs and brands to illustrate the points in the activity
- Small groups of between 2-5 – or more if required

TASK(S) AND RUNNING ORDER

1) Initial plenary and set up of ‘buzz’ groups
2) Consider in groups the linear approach to manufacture, retail and use of T-shirts and how this linear approach generates waste in the value chain
3) Consider in groups how to re-think or re-design the T-shirt to enable badges and visible logos to be removed cost effectively
4) Groups consider the prerequisites for the T-shirt circular business model to perform at least as well as the current linear case
5) Plenary to address unanswered questions and reflect on circular economy as a systems perspective

TIMINGS

Overall approximately 120 minutes. But can be extended or shortened depending on the group, prior experience, how much time is available and the use of any extension activities. Some suggested timings are:
Task 1: 20 mins; Task 2: 15-20 mins; Task 3: 20 mins; Task 4: 30 mins; Task 5: 15 mins.

THUMBNAIL RESOURCES

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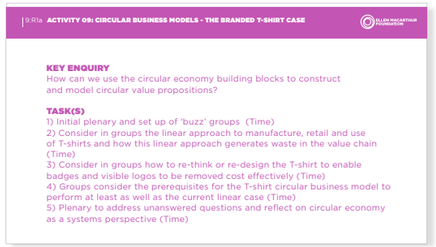
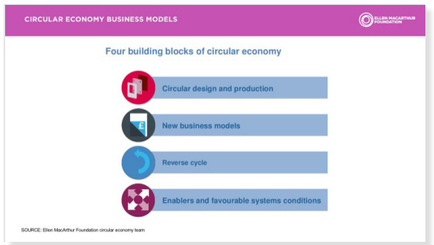
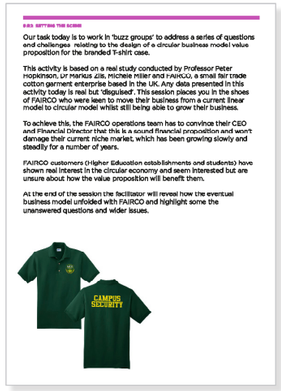
9:R1a Intro PPT slide



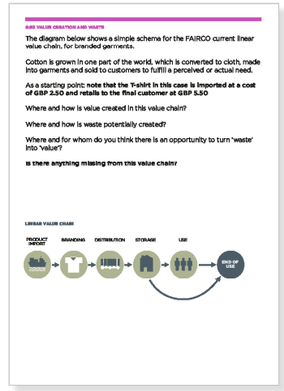
9: R1 PPT slide set: T-shirts, building blocks and business models



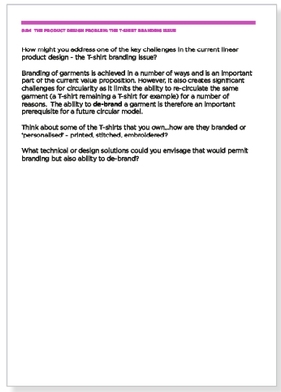
9:R2 Setting the scene



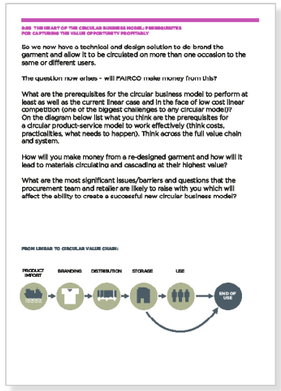
9:R3 Value creation and waste in T-shirt linear value chain



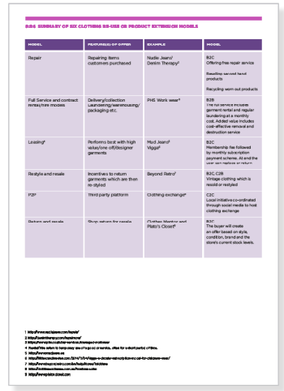
9:R4 The product design problem: the T-shirt branding issue



9:R5 The heart of the circular business model: prerequisites for capturing the value opportunity profitably



9:R6 Summary table of six clothing re-use or product extension models



9:R7 Background on textile/ clothing disposal in UK to set the scene and the issue of T-shirts/ Student unions in particular

ACTIVITY 10

COFFEE PRODUCTION AND CONSUMPTION SYSTEMS

HOW CAN BIOLOGICAL MATERIALS ‘CASCADING’ GENERATE VALUE CREATION AND DISTRIBUTION OPPORTUNITIES AS WELL AS REGENERATING CAPITALS?

OUTLINE

This activity emphasises how, in the biological cycle, the circular economy is about value creation/ distribution and regeneration of natural and social capital through biological materials cascading and approaches such as business ‘enterprise stacking’. This workshop activity uses the coffee production and consumption system as a context to explore Idriss Aberkane’s (2016) notion of Knowledge+ (biological) Waste = Asset (multiple assets through ‘cascading’). The main emphasis of the discussion in this session is on coffee **production** at the farm level but includes extension work around coffee **consumption** and coffee ‘waste’ cascading within cities.

RESOURCES AVAILABLE

- 10:R1a Intro PPT slide
- 10:R1 PPT Slides of introductory data on coffee and Task 2 briefing illustrations
- 10:R2a-e Introductory data on sun-grown and shade-grown coffee (graphs, photos, map, tabular data)
- 10:R3 Spider diagrams illustrating some differences between shade-grown and sun-grown coffee production systems
- 10:R4 Task 2 handout/brief/’prompt drawings’
- 10:R5 Efficiency versus effectiveness graph by Sally Goerner

ORGANISATION

- Small groups with plenary session. Potential use of PPT to introduce background on coffee production
- Small groups work at tables with large sheets of flipchart paper - requires scissors, pens and paper glue for applying ‘prompt diagrams’, annotation work etc.

TASK(S) AND RUNNING ORDER

1) Small group discussion to introduce sun-grown and shade-grown coffee production systems
2) Small groups develop ‘circular value’ system diagrams to visualise a large farm that includes shade-grown coffee (through a circular economy lens using regenerative design principles)
3) Plenary on the small group discussions - everyone gathers around a gallery to view the small group systems diagrams
4) Plenary debrief to reflect on why shade-grown coffee systems are not yet at scale

TIMINGS

Overall approximately 90 minutes. Task 1: 15 mins; Task 2:40-45 mins; Task 3: 15 mins; Task 4: 15 mins.

THUMBNAIL RESOURCES

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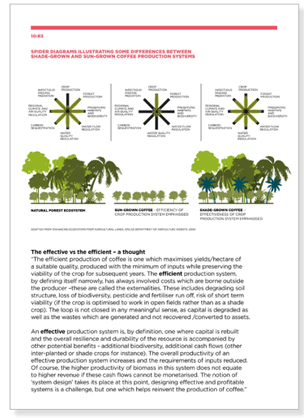
10:R1a Intro PPT slide

10:R1 PPT Slides of introductory data on coffee and Task 2 briefing illustrations

10:R2a-e Introductory data on sun-grown and shade-grown coffee (graphs, photos, map, tabular data)

10:R3 Spider diagrams illustrating some differences between shade-grown and sun-grown coffee production systems



10:R4 Task 2 handout/brief/’prompt drawings’

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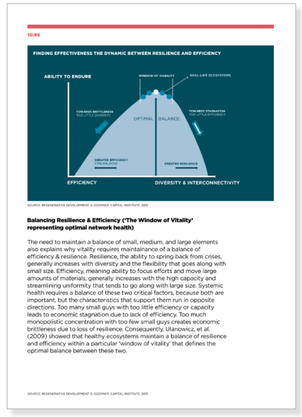

APPENDIX 1

A circular economy keynote lecture and professional development workshop

September 5-6, 2016,
São Paulo University, São Paulo, Brazil

Workshop Facilitators: Ken Webster with Jo Miller, Luisa Santiago and Aldo Roberto Ometto

Project development team: Ken Webster, Craig Johnson, Jo Miller, Luisa Santiago, Aldo Roberto Ometto, Fabio Guerrini, Yovana Barrera and Victoria Almeida

Brief description of workshop: a professional development workshop featuring hands-on, interactive sessions and activities. The concept of the circular economy is presented in all its dimensions and opened up for dialogue. The workshop activities will be designed to encourage discussion, clarification and reflection around key circular economy themes. These include: the role of digital technologies in increasing value; new business models especially products as services; the relationship between circular economy and sustainable development; the enabling conditions for a circular economy; opportunities at all scales - the impact on the informal economy; educating for a circular economy; the role of systems thinking and especially insights from living systems and its applications in both the biological and technical cycles.

DAY 1-MORNING	
9am –welcome-arrival **9.30-10 –introductions** **10- 11.30-lecture and Q&A**	Pre-workshop event: Extended Circular Economy lecture and Q&A Public Lecture by Ken Webster. Duration: 90 mins (See description above) Location: auditorium
12-1.30	LUNCH
1.30 workshop begins	
1.30-2	Welcome to workshop-introductions and circular economy (CE) (Luisa and Jo) Orientation on 'A sandwich, a butterfly and a cake!' with reference back to the morning lecture (Ken) (Ken, Jo and Luisa - Duration: 30 mins)
2-3.30	Introductory workshop session focusing on the Brazilian context for circular economy (Luisa, Aldo, Jo - Duration: 90 mins)
3.30-4	BREAK - TEA AND COFFEE
4.00-5.30	A short introductory hands-on activity: 'Teaching and learning matters' –explored using an exemplar on aluminium stocks and flows (Ken - Duration: 90 mins)
End 5.30	End of day one DINNER Networking and informal discussions to follow dinner

DAY 2-MORNING	
8-8.15am	Revisit Day 1: 'A 15 minute summary of Day 1' –with examples (Jo - Duration 15 mins)
8.15-12.15	Three hands-on workshop activities - Ken and Jo. Duration: 4 hours These 3 workshop activities are designed around three main elements: a) the biological nutrient cycle b) the technical nutrient cycle c) links with SDGs [Sustainable Development Goals] and creating enabling system conditions
30 minute BREAK in middle of this session- timing flexible	Activity 1, focusing on the Technical nutrient cycle Three stories about scale, selling and access over ownership. Turning consumers into users is one key to the 'technosphere' of a circular economy ('sharing' and on demand service economy). New business models. The digital revolution explored; the prospects for extended product life; product component and materials recovery and exchange. Duration: 1hr 15 min. Ken Activity 2, focusing on the Biological nutrient cycle Coffee waste=food? Using an example of a traded commodity (coffee) and the potential to create regenerative agricultural systems, multiple cash flows and turn waste into food in the city (with examples of digital enablement). Duration: 1hr 15 min. Ken and Jo Activity 3, focusing on how a circular economy might connect with SDGs and the idea of enabling conditions in an effective system (Example - tax shifting from labour to non-renewables). Duration: 1hr. Ken
12.15-1.30	LUNCH
1.30-3.30	Final workshop session Reflections on circular economy work potential in São Paulo University, connection with curriculum and different disciplines. This session will run in Portuguese but key outcomes for sharing to be in English. (Aldo/Luisa/Jo - Duration: 2 hours)
3.30-4	Workshop ends - closing comments and reflections (Aldo/Jo/Luisa) Complete short evaluation before departure (Jo)

CIRCULAR ECONOMY IN ACTION

Interactive resources for professional development workshops

This collection has been designed to encourage discussion, clarification and reflection within the context of a circular economy. Activities connect to themes associated with:

- understanding complex dynamic systems
- selling products as services and closing material loops
- creating multiple cash flows and rebuilding natural capital
- designing products, components and materials
- creating abundance rather than scarcity
- technologies, work and wages
- the meaning of participation in a circular economy

The various stimulus resources in this publication (with associated online downloads) are prompts and scaffolding for thinking and learning within professional development environments. They have been developed out of the experience of the Ellen MacArthur Foundation and the Technical University of Delft, Cranfield University, University of Exeter and the University of São Paulo.

Ellen MacArthur Foundation in partnership
with Cranfield University, TU Delft,
University of Exeter and University São Paulo.