

Circular Economy

5

Key Unit

THE CONTEXT

The end of the era of cheap fossil fuels and key materials, coupled with rising populations and limited water resources, food production and proliferation of harmful wastes, demonstrates the need for rethinking our model of production and consumption, beyond merely patching it up. In a world of finite resources and rising energy costs, how can we re-think and re-design our production model?

- ▶ THE IMAGE
- ▶ Circular Economy
- ▶ The idea
- ▶ Activities



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THE IMAGE

Rethinking our economy

We spend a lot of money and effort taking something from the ground, making stuff from it and then throwing it away. But where is away? If we keep taking a finite thing and dumping it, what will happen in the end?



Ellen MacArthur knows first-hand that when you race solo around the globe you take with you the minimum of resources and you manage them down to the last drop of diesel, last packet of food. A light boat is a fast boat, to mismanage is to lose or worse. It has become clear to her that on land things were not so different. This has inspired Ellen to find out more and she came to realize that it is not just a question of using less and less to make finite resources last a few more years but more about a complete re-think, so that resources are used, not used up, and products are used to be made again. This is the vision of a “circular economy”. She has created the Ellen MacArthur Foundation to help further this vision so that the next generation of students and business people will have both the knowledge and the framework to make this a reality.

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The Circular Economy

- 1** The current model of taking from the earth, making objects and then throwing them away is not sustainable, “you cannot run a linear system on a finite planet indefinitely”.
- 2** An alternative is the “circular economy” model which proposes a new way of thinking about our world: a systemic view based on the observation of nature.
- 3** Nature produces no waste: everything is reused, composted, digested. In the same way, manufactured goods must be designed and implemented with the least amount of energy, and waste products that go back into the production process.
- 4** The next generations must be encouraged to totally alter the way in which they think about our economy and industrial processes. They have to see that new, different and sustainable ways of living are possible!

The idea

The “circular economy” model is often called a ‘cradle to cradle’ or closed loop economy and its proponents insist that it should not be seen as an environmental movement, but as a different way of thinking: a design philosophy.

The main concepts

The circular economy and closed loop models propose the following concepts, based on the observation of nature:

Waste equals food: Waste should not exist; the biological and technical components (nutrients) of a product can be designed by intention to fit within a materials cycle, designed for disassembly and re-purposing. This implies: designing materials and products that are food for other systems, materials and products to be used over and over and that are safe.

Diversity is strength: Modularity, versatility and adaptation are to be prioritized in an uncertain and fast-evolving world. Diverse systems, with many connections and scales are more resilient in the face of external shocks, than systems built simply for efficiency.

Energy must come from renewable sources. As in life, any system should ultimately aim to run on ‘current sunshine’ and generate energy through renewable sources.

Systems thinking: The ability to understand how things influence one another within a whole. Elements are considered as ‘fitting in’ their infrastructure, environment and social context. Examples of these systems are all living systems.

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Prices must tell the truth: Prices are messages and to use resources rationally these prices should reflect the real cost of our activity. It is part of setting the 'rules of the game' for positive development cycles

Services not goods

Rethinking our economic model goes as far as redefining the relationship between objects and consumers. The emphasis on services rather than goods is a central idea of the new circular economy. Rather than an economy in which goods are made and sold, the model proposes a service economy wherein consumers obtain services by leasing or renting goods, rather than buying them outright.

Manufacturers would cease to think of themselves as sellers of products and become, instead, deliverers of service, provided by long-lasting, upgradeable durables. Their goal is selling results rather than equipment; performance and satisfaction rather than motors, fans, plastics, or condensers.

For example, instead of purchasing a washing machine, consumers could lease it, paying a monthly fee based on how much they used their washing machine. The washer would have a counter on it, just like an office photocopier, and would be maintained by the manufacturer on a regular basis, much the way mainframe computers are. If the machine ceased to provide its specific service, the manufacturer would be responsible for replacing or repairing it at no charge to the customer, because the washing machine would remain

the property of the manufacturer. The concept could likewise be applied to computers, cars, DVD players, video decks, refrigerators, and almost every other durable that people now buy, use up, and ultimately throw away. Because products would be returned to the manufacturer for continuous repair, reuse, and remanufacturing, Walter Stahel called the process 'cradle-to-cradle.'

Recycling is good, but it's not enough!

Recycling merely attempts to reduce the harm being caused by the current production model (a lesser evil) but still allows us to consume all of the finite resources. Thus, the current model proposes that we try and take a bit less from the earth and throw away a bit less. Where will this get us? Isn't it just delaying the inevitable? Taking the problem at its root – the design of products – is a totally different way of thinking.

Today, the debate about the environment and recycling is characterized by guilt, with a rhetoric stressing the need 'to minimize' and 'avoid' rather than 'to optimize' and 'support'. However, totally altering the way in which we design products, so that they can be reused in a loop economy, provides a new way of thinking and an optimistic view of our capacity to change the world.

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YOUR ideas

■ Brief

To raise awareness of how much we waste in society and what can be done about it

■ Materials

Pen, paper, internet, projector, board, markers

■ Steps

In pairs the students think about what they do every day from the moment they get up to when they go to bed. They should think about the products they use and list them, e.g. soap, face creams, hair spray, breakfast food, clothes, transports, papers, chairs, books, pens, towels, sheets, cushions, computers, mobile phones, tables, televisions, pans, fridges, microwaves, ovens, dishwasher, etc.

Once they have completed their list they should discuss which of these products are thrown away once they have been used and no longer work, and which ones are fixed and reused. The results should demonstrate that we waste an enormous amount.

Watch Ellen MacArthur's video on circular economy:

http://www.ellenmacarthurfoundation.org/convince_me

In an open discussion have students discuss the pros and cons of the circular economy.



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YOUR initiatives

■ Brief

To write the script, and if possible, film a television commercial promoting products that demonstrate the main concepts of the circular economy.

■ Materials

Camera (or mobile), paper, pens, computer, internet and any extra props or materials that the students require.

Steps

Across the world, companies are beginning to design products that expound the main ideas of the circular economy. For instance, Harmless Packaging is making a line of bags and envelopes with incredible strength which completely biodegrade into naturally occurring substances. Using existing products like this or even designing their own biodegradable products, students will write and film a television commercial which describes the main virtues of these products.

In groups minimum of four they begin by researching the product they would like to promote, which could be taken from, or inspired by the products found on the following links <http://www.harmlesspackaging.co.uk/>, <http://www.ecoproducts.com/index.php> and <http://www.climatex.com>. Students should write down the key selling points of the product but always keeping the emphasis on sustainability and the cradle to cradle philosophy <http://www.mbdc.com/default.aspx>. While planning their commercial it is a good idea to think about target audience to help develop a style later in the planning process.

Once the key selling points have been categorized the students should think about the form of the commercial. They can achieve this through researching different TV commercials available on sites like www.youtube.com. The students should always bear in mind that the commercial will be filmed; they shouldn't try to be too ambitious and just keep their ideas



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▶▶ simple given the constraints of the filming and environment. Once they have a clear idea they can draw out a storyboard depicting every shot that will be necessary throughout the shoot. This will include specific camera angles and any added instructions for the camera person and director. Once the idea has materialized the students should start to script the commercial and cast the members of the group (if necessary) always bearing in mind the commercial should not be longer than 30 seconds. The students can also prepare a technical guide of what they will need such as cameras, props, costumes, etc.

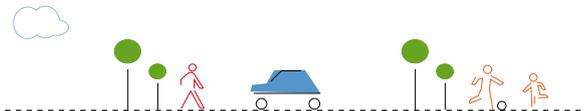
Finally students can begin to shoot the commercial. They should find an adequate space with room for movement. If there is not a video camera then they should use mobile phones, web cams or a digital still camera with video setting. If the students feel they need to edit their video and have filmed their commercial using a digital camera they can use the following site <http://jaycut.com/> to edit, add captions or titles to improve the overall look.

In addition, a competition could be developed to find the best commercial where other students and teachers in the school can vote on their favorite ones.



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YOUR ideas

■ Brief

According to the proponents of the circular economy, our industrial systems should function as living organisms, synthesizing nutrients that in turn will feed the industrial cycle. But what is the cycle of an ecosystem? And how could an industrial production process run in the same way?

■ Objectives

To understand pictorially the concept of closed-loop cycle

■ Materials

Patterns to print

■ Steps

The teacher will expose students to the cycle of a natural ecosystem with a drawing. In nature the waste does not exist, and is fully reintegrated into the cycle: a life is given to another life.

The teacher will then ask the class to draw on the same process produced in the economy, starting with materials, through production, distribution, use and then at the end of their use. The teacher should ask:

- What happens then?
- Waste is part of the natural ecosystem?
- Why?
- What are the consequences?
- Can industrial waste be reduced or eliminated by re-injecting it into the economy, as in nature?
- How can we achieve zero waste?

The teacher lets the students discuss and present the pattern of linear economy and that of the circular economy and answers the questions they ask.

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YOUR initiatives

■ Objectives

To create a model car with recycled materials to raise awareness of the circular economy.

■ Materials

Paper, pens, board

■ Steps

The teacher reminds students the principles of circular economy. He asks them to apply them to design a vehicle that would be built only by using recycled materials, recycled and reused. Students should make a list of all materials used in the manufacture of their model and explain why they meet the criteria of the circular economy. The cars will be presented in class and students will vote for the one they find most functional and “circular”.



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Ellen MacArthur Foundation

The Ellen MacArthur Foundation is an independent charity with the purpose of inspiring people to re-think, to re-design and build a positive future.

The Foundation places emphasis on “systems thinking”, the understanding of a phenomenon within the context of a larger whole; to understand things systemically, literally means putting them into a context, to establish the nature of their relationships.

- <http://www.ellenmacarthurfoundation.org/>



Circular economy

The “circular economy” model is often called a ‘cradle to cradle’ or closed loop economy and its proponents insist that it should not be seen as an environmental movement, but as a different way of thinking: a design philosophy.

More information about the circular economy and associated concepts at the following links:

- <http://www.ellenmacarthurfoundation.org/about/circular-economy>

To watch a video about the circular economy, go to the following links:

- http://www.ellenmacarthurfoundation.org/convince_me
- <http://www.youtube.com/watch?v=DGERjaaY40g>

The Story of Stuff

The Story of Stuff is a 20-minute, fast-paced, fact-filled look at the underside of our production and consumption patterns. *The Story of Stuff* exposes the connections between a huge number of environmental and social issues, and calls us to join together to create a more sustainable and just world.

- <http://www.youtube.com/watch?v=gLBE5QAYXp8>



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