

## **A reflection on the Circular Economy and the Study Visit to s' Hertogenbosch, Netherlands March 2012**

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It is a precious opportunity to step outside the routine of teaching and have the time to reflect on a developing area and consider how this may impact on our lives and on the education of our young people. I was delighted to be offered that through Education Scotland in the SCIPD visit to Netherlands this year and am conscious of the responsibility to take ideas forward in my own school environment and more widely in Scotland. Education Scotland has been quite visionary in recognising the work of the Ellen MacArthur Foundation and the potential for the Circular Economy to impact all our lives. Circular Economy thinking builds on the commitment by the Scottish Government to Zero Waste and as the ideas disseminate through the business sector in Scotland the reality and practical possibilities become more exciting. Although our visit to the Netherlands aimed to demonstrate Business and Education working alongside the Circular Economy ideas, our group did not see a great deal of evidence that the schools and colleges had grasped the concepts. It struck us forcibly that Scotland had an exciting opportunity to be pioneering in this.

Before teaching, I worked for a number of years in Heavy Engineering and the Power industry. The manufacturing environment is a very different experience to other business areas. People become very passionate about the product they make. It could be argued that, in our very consumerist society, if people reconnected with how things are made, they may ask more questions about the processes and materials used and about their disposal. This of course goes to the heart of the ideas on Circular Economy thinking. We are being encouraged to look at the impact we make on our natural resources and think creatively about how it can be different and better.

### **The tour**

The quality of our experience in the Netherlands was excellent. We were accompanied and shepherded by two members of the Ellen MacArthur foundation who conveyed their passion about the Circular Economy. It helped that we were a diverse group from different schools in Scotland, diverse in our teaching experiences and subject areas but with a shared interest in looking at new ideas that may enhance our teaching. Meeting others with passion and enthusiasm in their subject is always refreshing and stimulating.

The tour consisted of seminars and discussions with an educational consultancy group, KPC in Den Bosch, industry and educational visits.

We were given an interesting insight into the structure of the Dutch Education System which is quite different from our own. At 12 years leaving primary school, there is no formal assessment but children are assessed by the school on 58 attainment targets and in consultation with parents, a recommendation goes forward to the secondary school on the child's potential and direction regarding the three strands VMBO (Vocational), HAVO(Applied University), VWO(University). It was stressed that although the strands are separate schools, there is the ability to move between systems at various points.

We ourselves were introduced to the concepts of the Circular Economy through use and discussion of teaching resources being trialled by the Ellen MacArthur Foundation. These resources are now formally available through the Ellen MacArthur website.

The concept of "Cradle to Cradle" (C2C) has been developing since 2006 and is concerned with redesign and innovative thinking. All elements of a product at the end of its use are disassembled and either used as "nutrients" for another product or recycled as non-toxic waste. The Ellen MacArthur Foundation has many collaborations with prominent businesses such as Cisco, Renault, B&Q.

Douwe-Jan Joustra, a Dutch educational consultant spoke to us on the political and educational journey in the Netherlands. Recycling is strongly established in Dutch society and they see the move to C2C as a progression. He introduced the concept of leasing products and gave an example of Philips supplying lighting on a leasing basis, being responsible for all materials, reuse and maintenance resulting in return of all valuable materials back to Philips. This idea of leasing obviously has implications for financing capital for business.

We visited the Rotunde School (12-18) and King Willhem College I (16-18). An inspiring and charismatic headteacher spoke of his passion to inspire children by creating a learning environment where they saw environmental ideas in practice and had worked hard to involve pupils in the decisions made in the school refurbishment so they felt ownership for their environment. We saw carefully designed learning spaces and green energy technology. In the FE college, they had developed many partnerships with industry and with projects abroad enhancing their education programmes on sustainability.

Our two industry visits were to the carpet manufacturer Desso and the 5<sup>th</sup> largest waste management company in Europe. Van Ganswinkel. Desso is a leading manufacturer of carpet tiles/Carpets and artificial grass pitches. They have made an investment and a commitment to Circular Economy ideas believing that the economic justification is there and in the long term, this approach will ensure they have a strategy to compete with the rising costs of raw materials. They have a “Take Back Program” to take back carpets at the end of their life and recycle.

Van Ganswinkel is involved in collection, recycling and waste to energy management aiming to send minimal waste to landfill. Many companies are working on plastics from bio materials not oil based. Alternatively designers are looking at how oil can be extracted from plastic. Some textile companies are looking at designing clothing that will completely recycle. Van Ganswinkel have partnered Oce paper company and produced totally recycled, high quality paper. If people can design products that can be totally disassembled then the recycled materials can be valuable and sold on to another company. This leads us to the concept of “Urban Mining” where companies will find it cost effective to take back materials from recycled products.

### **Taking Ideas Forward**

When presented with stimulating ideas, the challenge is to be able to find ways to inspire others. Education Scotland has facilitated further opportunities to allow ideas to be shared within the group and more widely. Within my own school, my colleague Robert Furness and I asked for the opportunity to present to all staff at the first Inset day in April. We were both very encouraged by the positive reception from colleagues and have since asked Heads of Departments to evaluate some of the teaching resources from the Ellen MacArthur Foundation. They were asked to look at whether specific materials would be useful to include in the new curriculum. The feedback has been very positive and we will continue to talk with colleagues to encourage dissemination of ideas across the curriculum.

As an Assistant Year Tutor, I had the opportunity to set aside some time in the Form activities for S3 to Circular Economy. I adapted some of the materials to give a brief introduction to the Circular Economy and the feedback from Form teachers and pupils has been very encouraging. We looked at clothing and textiles and the possibilities there are to change our thinking in design and disposal. The S3 Charity committee were planning a fashion show later in the year and they are now considering a recycle or ethically made theme to the clothing.

In my subject area of mathematics, there is potential to develop some material linked to the Circular Economy. An obvious area would be in statistics. As well as developing skills using contextual examples, the interpretation of these is also critical. At the moment the resource materials from the Ellen MacArthur Foundation do not include specific maths content that could map easily onto our curriculum in Scotland but there is an opportunity to develop this.

Future plans include, setting up an S6 interest group to look at the Circular Economy ideas and develop practical ways of getting involved, including canteen waste, energy survey and links with industry.

- There is already a company in Edinburgh making plastic cutlery and food cartons that are totally compostable.
- We are scheduled to carry out an energy survey as part of our Recycling program and it would be interesting to evaluate sustainable choices within that.
- As companies are identified in Scotland who are taking on the Circular ideas, it would be possible to visit or understand some of the problems they face. In the material I used with S3 I included a reference to Argent Energy in Scotland who are generating bio fuels from old chip fat and animal waste. As we found on our visit to the Netherlands, seeing the ideas in action on our industrial visits had the greatest impact.

## **Appendix**

Powerpoint presentation

S3 introductory sessions

## **Teachers Notes**

**Aim:** This material should span 3 form periods and could take longer if you can find the time. Have a look at the materials yourself and by all means choose to explore what you feel will interest the pupils. The aim is to introduce the concept of the Circular Economy and start people thinking about how they could change the way they use and dispose of many everyday products.

**Introduction:** There are a number of video clips and a corresponding question sheet to help understand the main themes. You can ask the pupils to complete the question sheet as you watch the video and use the answers for discussion. The first session introduces the concepts, the second gives practical examples and the third is a discussion activity where pupils come to understand the different problems manufacturers face and choices we have as consumers.

**Equipment needed:** access to computers with online streaming, presentation facilities. Last activity... blue tack , decision cards, paper and pencil for pupils to write their names.

## **Notes on the Circular Economy:**

The Circular Economy is fundamentally about changing thinking in our ever growing consumer society. By changing how products are made, at the end of their life, all materials should be easily disassembled and either reused or be easily disposed of as non-toxic waste. We would then not use up as many precious resources, the costs of which are rapidly rising and impacting on the prices we will have to pay.

We need to encourage young people and businesses to be imaginative and creative to think of ways that products can be redesigned. Ideally we should be striving to use sustainable energy sources also.

The Circular approach relies on materials being recovered and fed back into the same system or another system and reused. Products will still have to be well designed to meet customer demands. This approach differs from recycling in that it looks at the whole system from the start of a product so that waste and disassembly are thought about at design stage.

Ellen Macarthur believes that this change to the Economy is inevitable and the earlier we think about it the better we will cope with the impact. The Scottish Government is committed to a Zero Waste Plan and Learning Teaching Scotland is including the circular Economy ideas in the new Scottish Curriculum. There is a growing awareness amongst Scottish businesses that there is economic sense in the ideas. Some have products that are moving towards a Circular System approach already.

Another concept within the Circular Economy approach is Leasing. Products can be leased to customers and taken back at the end of the lease. Materials can then be reused and their value retained within the company. Mobile phones for example, have many valuable components and minerals that are lost to landfill and with different thinking, they could be recovered.

A good reference to find out more is the Ellen Macarthur website at

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

## **Session 1 – Introduction to the Circular Economy (otherwise known as The Blue Economy, the Closed-Loop Economy, Cradle-to-Cradle thinking)**

1. Issue pupils with a question sheet to note down answers as they listen to the videos.
2. Watch Re-Thinking Progress: The Circular Economy (4 minutes long) on <http://www.ellenmacarthurfoundation.org/>

This video is a discussion with Ellen Macarthur, the round the world yachtswoman, who has set up a foundation to educate about the circular economy. More and more schools, universities and companies are including these ideas in their education programs and design thinking.

Did you know that a team of Hutchie pupils won her redesign project last year and the pupils had a chance to visit some major companies to see it in action!

3. Growing world population and shortage of resources will mean that Cradle to cradle ideas may become essential –

watch <http://www.youtube.com/watch?v=4jORau0V62c> (6 minutes).

Again, see the 3 principles here called (a) ALL materials in continuous cycles, (b) renewable energy only and (c) celebrating diversity. This leads onto Cradle-to-Cradle design. The video contrasts the sustainability strategy with the Cradle-to-Cradle strategy.

## **Session 2 – Some businesses that are basing their development on these principles**

The first video is on Nike's work in this area and should be interesting to pupils.

1. **Nike** – a company in transition towards closed-loop (still thinking a bit about sustainability...)

**Make sure this video starts about trainers.** This link takes you to the page but you need to scroll down to the **Business Case 2 Nike** video and play it

<http://www.ellenmacarthurfoundation.org/videos?video=Business%20Case%20Study%202:%20Nike> (6 minute)

The next video will cause some laughs. Poo is recycled and used to generate new products! Poo Power! It is truly circular!

2. An example of closing the loop from an NGO from Brazil working in Haiti (2 minutes – starts with an advertisement for something completely different.)

<http://www.reuters.com/news/video?videoChannel=2602&videoId=60852403>.

### **Additional material if you have time**

3. After the video read a short article (8 minutes) on how this idea could be used in UK on

<http://news.bbc.co.uk/1/hi/magazine/8501236.stm>

4. Here is a Scottish company that is producing bio fuels from old chip fat and animal waste. <http://www.argentenergy.com/>



### **Session 3 – Deepening your understanding of the Circular Economy**

**This activity aims to help students to explore their own values and viewpoints and those of their classmates, of the roles and responsibilities of a textile designer and a consumer.**

#### **Introduce the activity**

- Ask each student to write their name on a small piece of paper, approximately 10cm x 6cm.
- Place one of the statements below in the middle of the board – then ask your students to place their name cards close to the statement if they agree with it and further away if they don't.
- Ask a few students to justify why they have put their name card where they have.
- Following the discussion allow students to change the position of their cards if their views have changed as a result of the class discussion.
- Continue with three to four statements until you feel that the students have grasped the idea that as individuals, we have choices and we can influence what will happen in the future.

**Textile companies should set up systems to encourage consumers to take clothes that are finished with to a recycling system**

**I love buying cheap clothes, and I don't really care how or where they were made**

**Textile designers should design quality products that are designed to last so that we buy fewer clothes**

**I would prefer to buy clothes that I knew would be able to be completely reused with no waste**

**I'd be OK with the idea of leasing clothes and taking them back after I'd finished with them**

## **Questions on the Circular Economy Rethinking the future Video**

Who is Ellen Macarthur?

Why is she motivated to change our thinking about how we use our resources?

How is the Circular model different from what we have now?

What is the carpet manufacturer doing that is circular?

Does it seem as if major companies agree with her?

What is she suggesting may happen with B&Q in the future?

What is the name of the school's competition she runs?

## **Cradle to Cradle REGGS film**

How many people are there in the world just now?

Give two main problems in the future, created by our consumer society?

What are the 2 strategies suggested here?

Complete the phrase used for the Strategy 1      RE\_\_\_\_\_,  
RE\_\_\_\_\_, RE\_\_\_\_\_

Complete the phrase for strategy 2      Waste = \_\_\_\_\_

Why is Cradle to Cradle different from simply recycling?

What is suggested about leasing or borrowing products?

What energy should we be using and why?

What does diversity mean?

Who benefits from a Cradle to Cradle design approach?

## **Nike video**

How many trainers are sold each year?

What does biodegrade mean?

What commercial pressures have motivated Nike to look at changing their design?

What have they called their new Circular product?

What have the Nike designers done in the new shoe that is environmentally good?

Is the trainer Closed Loop?

How many plastic bottles go into 1 shirt?

## **Poo Power**

Why is this a circular system?

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**Please complete and return for feedback.**

Do you think you understand what the circular Economy means?

How would you describe it to someone who had not heard of it?

What did you find most interesting in the sessions?

Do you think that this is an important issue that affects you?

Would you like to get involved in designing a new system for something you currently use?

What could that be?