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Report on SCIPD visit to S'Hertogenbosch with the Ellen MacArthur Foundation

Overview and Aims of Visit

Our Group was to visit Educational Establishments, Educational Steering Groups and Commercial organizations in the Netherlands. With a view as to how they teach and work in an environmentally sustainable (specifically Cradle to Cradle) manner. The trip was a collaborative exercise between Education Scotland and the Ellen MacArthur Foundation. Our intentions were to look at the how the Netherlands implements sustainability and Cradle to Cradle (C2C) teaching in its educational system.

Individual Visits Made

KPC Groep Offices

The first day started with a visit to the KPC Groep offices. An organisation analogous to Education Scotland, however it is a privately funded organization as opposed to government funded one.

The first person to speak to the group was James Pitt of the Ellen MacArthur Foundation. James has a background initially as a teacher of Technology and latterly as a Research Fellow at the University of York. And is now the director of strategy at the Ellen MacArthur Foundation. James spoke to us about the Foundations aims for developing Cradle to Cradle thinking in both Educational and Industrial settings.

Douwe Jan Joustra was the next person to address us, his role was both as an adviser to the Dutch Government and as a partner in a firm offering C2C consultancy. Douwe worked closely with the government after a prominent lawyer had organized a conference about C2C that was attended by 600 business people, civil servants, government ministers and academics. This conference was triggered by the television Documentary Waste = Food in 2006. The attendance was much bigger and attracted much more influential people than the organisers of it expected. It was described as getting the press, industry, government and the populace very interested in discussing and implementing its ideas.

Although he reported directly to higher levels of government he was allowed to experiment in working in different ways to raise C2Cs profile and implement in a large variety of different areas of industry. He has now moved on to private consultancy for C2C, as his role for the government had succeeded in its aim that was to get industry to take the lead by putting C2C into mainstream practice.

Jenne Van De Velde, who is part of National Centre for Curriculum Development, spoke to us on the structure of the countries education system. The main difference between the Scottish secondary system and the Dutch one was the specialisation of Education at this level in the Netherlands with secondary education split into three levels: vocational, professional and pre-university secondary establishments with limited chances for pupils to shuttle between these levels. This point was touched on several times by various speakers during the visit.

De Rotonde

We then visited a Specialist school De Rotonde and were given a tour by the headteacher Mr Hans Derks. The school was in the middle of a major refit and refresh. This visit mainly centered on the Dutch School Curriculum and its specialisation in relation the schools cohort. It was noted by our group of the large influence that the Headteacher had on the current renovation of the school, with regards the makeup and facilities that were to be provided. C2C was not particularly well touched on during the visit.

Konig Willem 1 College

We then visited Konig Willem 1 College, offering courses and training similar to colleges in UK but on much larger scale - it had 6000 full time and 6000 part time students. Due to much more specialisation in courses and departments this was the Educational Establishment most geared up to look at C2C and Sustainability in both a research and teaching sense. However I felt that the focus was very much on designing for sustainability, rather than a fully cyclical joined up approach that was being pushed by the commercial organizations we spoke to during the visit. The focus of the teaching was still very much to use less of materials, rather than designing and manufacturing for inorganic and organic C2C cycles.

Desso Carpets

Rudi Daelmans is the sustainability manager of this company. This is a position that the company did not have in an earlier and less environmentally aware incarnation. This company seemed to be well on the way to achieving C2C working processes in a full a way as is possible with present large scale infrastructure. With only the energy sourcing not fitting into the strict C2C structure well. This is pretty difficult for any organisation to achieve at the present time however, as much would have to change on a technological capability and national policy level to get towards this goal. The company is working towards a leasing system for all of its products, to ensure their waste materials are processed and reused in the most efficient way possible. They are putting a lot of effort into increasing the efficiency of the reuse of materials and the reduction of the harm that their products do to their end users and

immediate environment. Rudi spoke of the challenges that faced designers and manufacturers being centered on continual refinements leading to full C2C manufacturing. And the quick changes to materials, designs and production processes that will be caused by this push.

Van Gansewinkel

Van Gansewinkel came across as a very large player in their field (Waste Disposal and Recycling) on an international scale. They have been working in partnership with a number of governments, agencies and companies to work towards less disposal and destruction of materials. They are very proud of a joint project with Phillips where 3 products had redesigns using recycled materials. These were produced in such a way that recovery of the raw materials within them will be easier come the end of their design life. The big plus about this project is that the new designs from Phillips ended up being cheaper to produce in the long run, in addition into fitting more with the aims of C2C. Van Gansewinkel are aiming (over a long term) to link up both organic and inorganic cycles of manufacturing. Companies will give them the waste products and they will return it to them in a form suitable for manufacturing. Their aim is to eventually send as little material as possible to be destroyed or landfilled. They are of the view however that there will always be a small amount of material that is economically unviable or too difficult to reuse. They hope to recycle more and more materials for reuse (technological cycle), and for those that are too difficult or degraded to recycle to be used to provide heat and power as biomass (biological cycle).

Olympia

The fabric of this modern building and its infrastructure is very forward thinking regarding energy efficiency and sustainability. Again C2C is something that is on the horizon of teaching here. The focus again was more on the structure of their establishment (both physical and political), rather on how C2C and sustainability is taught to young people.

Conclusions and Further Work.

Industry in the Netherlands is very keen on the concepts offered by C2C. There is large network (approximately 200) of organisations and businesses that are starting to work in conjunction with each other to achieve a C2C mode of production. Government has become more hands off in recent years, as their aim was to get industry and education to buy into and promote this themselves. This is now the case with industry, it is still in the early stages of embedding itself in education. I feel however if employers are looking for the awareness and skills required by C2C this will drive changes to the education of design, materials technology, marketing and a number of other areas.

Schools in the Netherlands are still very much on the sustainability and recycling route. The establishments that we saw apart from one (Konig Willem College) were very focused on how they taught pupils on a general level, and how their premises were structured to be sustainable and environmentally friendly. I saw limited evidence that information regarding C2C, while being much more widely known by the general public and being implemented by industry, was being passed to school pupils. Konig Willem College (due in part to offering specialised courses) had a working and teaching knowledge of sustainability practices under which C2C could be taught through, although the teaching was not solely focused on the concept. And was built round a much wider view of design and manufacture, and how it impacts the environment.

I feel the circular economy will bring big changes to industry and society due to the coming scarcity of materials. This will inevitably increase the cost of cradle to grave manufacturing as stocks decline and the cost and complexity of replenishing them rises. There is every chance that it will become the cheapest way to produce products, after a tipping point whereby it will become less expensive to design for reclamation than throw away and produce with new material. It may be hard to sell consumers the idea that they will only lease products, rather than have outright ownership of them and the elements contained within them. This will have a large social impact as many people can define themselves by what they have worked to possess and accumulate.

The four concepts behind the circular economy may not all mature simultaneously and I suspect that there will be a number of steps taken to a full circular economy that combine cradle to grave and cradle to cradle thinking. Waste = Food is well on the way to maturation and is already part of public consciousness in Scotland by the drive towards recycling materials. Systems thinking has always been integral to modern engineering thinking within education at a number of levels and this can be easily adapted to designing and making items within cradle to cradle. Diversity in design and manufacturing may be an issue at present, as the current mode for mass production aims for uniformity in materials and processes to reduce costs. Production of goods may need to move towards more tailored and smaller scale setups to allow this part to come into play fully. In addition to more collaboration for mutual benefit between suppliers, designers, manufacturers and recyclers. The greatest obstacle is the need to produce energy from renewable sources, with as little impact as possible to environment. This will only happen fully when the energy industries are forced by legislation to outlaw certain types of power creation. Or the cost of gaining and refining fossil fuels increases too much. This will probably be the last one of the four to come on stream and fulfill the goal of a fully circular economy. That is if the model for the ideal is not radically altered by technological developments over the coming decades. I feel it may be a concept that will be many generations away from 100% implementation. However any move towards it looks like it will be of benefit to the vast majority of people.

In the Netherlands the circular economy is becoming well embedded within a number of industries. However from an educational standpoint, while there is good practice with regards to teaching and experiencing efficiency (in energy and materials) and sustainability. There is little coverage of circular economy thinking at school and further education level. I feel this situation would be common in any country as there is always a lag between industry innovation and education catch up. I feel this is due to budgetary restraints in Education and the inertia inherent in Educational systems when facing fast moving changes in Industry and the Commercial sectors.

The Ellen McArthur foundation has recruited Colin Webster to work full time with educationalists in Scotland. It is the foundations hope that Scotland will be a test bed and forerunner for the teaching of these concepts. Resources are being produced and developed currently by Colin in conjunction with teachers.

I have taught some early experimental lessons with pupils on Cradle to Cradle at a number of levels. I will look to incorporate and share these lessons and resources with colleagues within the school and within my region. I am involved with the creation of Design and Make courses for Glasgow City council. I am currently integrating C2C and sustainability into the new course. This should be finalised and rolled out to all schools at the beginning of 2013. I am due to speak to my schools board of studies about C2C to try and get more departments within the school on board with this concept. My colleague who runs the Eco Schools group and I are planning to work on project during the summer term, a greenhouse made from reclaimed materials. My hope is that by filtering the concept out from The Ellen MacArthur foundation, the teachers who experienced the visit and by industry demanding changes C2C will hopefully become more pervasive in my subject and others over time.

In order to push the circular economy concept within Scottish education we need to develop in a number of areas.

- Forge links with industry within Scotland who are early adopters of the circular economy concept. Companies such as the Scottish Leather Group are working towards this at present, and are local to the Glasgow area.
- Various subjects will need to work in conjunction to help teach the concept. Technology for Design and Manufacturing, Science for Materials and innovations that assist moves towards C2C, Business Studies to look at altered business models that will need to be utilised.
- During the creation of the new National 4 and 5 courses by councils there should be a push to include C2C concepts in lessons and coursework.
- Continue to work with industry and educationalists within other European countries that are further along the path of this way of working.
- Be creative in bringing in educational aids and equipment to help teach the concept. Within my subject (Technology) there is a

definite gap between budgetary constraints and equipment that is an analogue of processes that currently get used in industry.

- Look at the concept of the circular economy of energy usage (energy should only be provided by the sun) eventually coming only from sustainable sources (wind, wave, geothermal, solar). We should take advantage of Scotland's position as center for the industrial implementation of renewable energy and tap into local industries.