



The Circular Economy: implications for the Environmental Movement

Report for Scottish Environment LINK



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Summary

This report concerns the potential environmental benefits offered by the concept of the Circular Economy, its weaknesses and its relevance to LINK members. It is based on a survey of LINK members and a workshop as well as a review of literature and discussions with other stakeholders.

A circular economy alters material flows within the economy so that resources are retained in productive use for as long as possible, at the highest possible utility and value, through multiple cycles. Instead of being designed for disposal after use as in a linear economy, products are designed and made to be used again. Aspirations towards a more circular economy have become popular recently and the Scottish Government is seen as a leader in terms of embracing the concept and reviewing opportunities to adopt it.

A circular economy has potential benefits in terms of competitive advantage, employment, waste reduction and the environment. It tends to be promoted from different perspectives, depending on the sector involved. The business case for companies moving away from over-reliance on finite resources and developing innovative and forward thinking products and services is often promoted along with figures showing opportunities for growth in specific areas. There is less emphasis on the environmental benefits, although there has been a report showing that it would have a positive impact on CO² emissions in Scotland.

A more circular economy has a number of potential benefits to the environment, but depending on how it is conceived or which dimension is given priority, these benefits may not be realised.

LINK members see a more circular economy to have the following strengths:

- Reduced rates of extraction of natural resources and associated environmental impacts;
- Reduced waste requiring disposal;
- Reduced energy use and CO² emissions;
- It is consistent with following maximum sustainable yields and maintaining soil productivity and soil health;
- Reduction in litter, including marine litter.

There are a number of areas to which we would urge the Scottish Government to give greater priority:

- A greater focus on on sectors which offer environmental gains;
- Greater priority given to important sectors such as the built environment and agriculture/land use;
- Assessment of Environmental impact in terms of footprints as well as resource efficiency;
- More attention to addressing cultural obstacles to shifting to reduced consumption;
- Proper addressing of difficulties in implementation.

This report recommends that:

- a. LINK should welcome in principle the Scottish Government's commitment to pursue a circular economy as a step in the right direction, and offer constructive suggestions.
- b. LINK should press the Scottish Government to present the circular economy model in a way that shows the need for an absolute reduction in the rate of consumption of finite resources, alongside the focus on economic development.

- c. LINK and its members should challenge the Scottish Government to deliver on specific key targets in its circular economy proposals, and to incorporate resource indicators, footprint measures and some measures of the degree of circularity.
- d. LINK should challenge the Scottish Government on actions and policies which contradict the circular economy approach.
- e. LINK should continue to press for circular economy action on food production and soils, marine resources and the built environment.
- f. LINK should emphasise the value of the circular economy model in demonstrating how the interests of environmental protection and economic development can be consistent with one another.
- g. LINK should challenge the tendency of many of those advocating a circular economy for competitiveness reasons to downplay the significance of the fundamental environmental imperatives.
- h. LINK and its members should take the opportunity to develop deeper understanding of and alliances around the concept and its practical implementation.

Introduction

The concept of the Circular Economy has become very topical over recent years, driven by growing recognition of the need to tackle rising resource consumption and waste production, along with the realisation by some major corporations that they need to take steps to ensure future resource security, and reinforced by the work of organisations presenting arguments for a more circular economy. Continuing to follow the traditional model of a Linear Economy, from exploitation of the natural world all the way through to “throwing away the waste” in the era of climate change, is becoming untenable. There is a growing realisation that natural resources on this planet are finite - and that there is no such place as “away”.

This report looks at the potential environmental benefits offered by the Circular Economy and how it might contribute towards achieving the objectives of environmental organisations in Scotland, specifically Scottish Environment LINK and its members.

LINK commissioned the study in August 2015 and work was undertaken during September and October, including: desk research to bring together the different perspectives on the Circular Economy; a web-based survey of LINK members to ascertain their knowledge of and opinions regarding the Circular Economy; and a workshop for LINK members to discuss the strengths, weaknesses, opportunities and threats of the concept for the environmental movement. The timing of the study coincided with a Scottish Government consultation exercise on its proposed approach to implementing Circular Economy principles in Scotland.

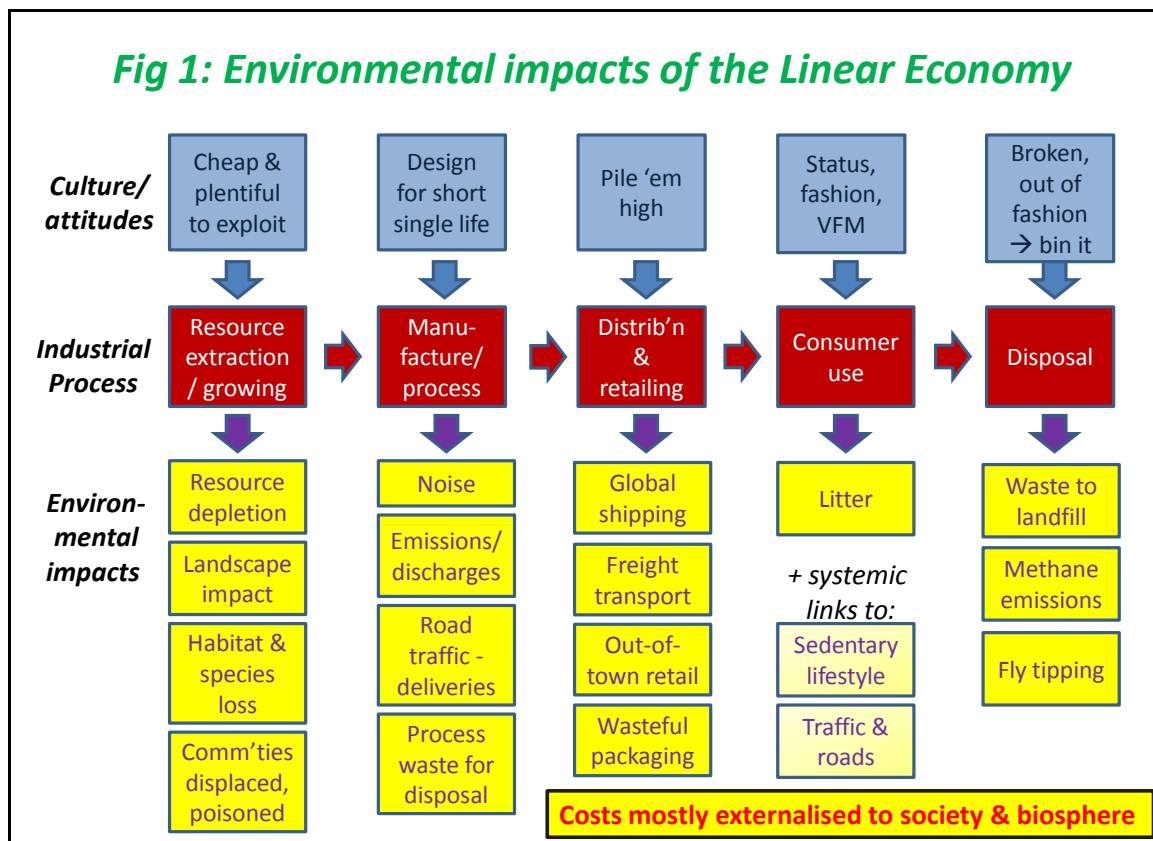
The report is organised as follows:

- Section 1 examines the concept itself: its meaning, origins, different interpretations, and current use in Scotland.
- Section 2 considers the strengths and weaknesses of the concept from an environmental perspective, both in principle and in relation to how it is currently being applied.
- Section 3 looks at the public policy issues that arise, or may arise, in a Scottish context.
- Section 4 sets out a number of recommendations.

1 “Circular Economy”: meaning, origins and current use

Emergence of the Circular Economy Model

1.1 Our current economic model is dominated by a **linear approach** to production and consumption, where materials are extracted (or grown), then made into products which are used by consumers and then disposed of along with other waste generated during these processes (see Figure 1 below). This linear economic model became more pronounced following the Second World War, as companies sought to increase their sales through new products and built-in obsolescence, whilst consumers enjoyed the new choices opening up to them with increasing affluence, and gained social status from conspicuous consumption. This was the basis of the throwaway culture in “developed industrial societies”. It required the easy availability of raw materials, plenty of space to dispose of waste, and disregard for the environmental impacts which were thereby “externalised”, to be borne by society and the biosphere. Figure 1 illustrates these impacts.



1.2 **Concerns grew** during the 1960s and 1970s about the impacts of this growth in consumption and waste on the planet and its resources.ⁱ During the 1970s, **Walter Stahel** set up the Product Life Institute in Geneva, which developed a circular approach to the economy based on biological systems and the circular flow of materials. It promoted: the extension of product life; reconditioning of used products; reduction in waste; a shift from selling products to selling services; and more localisation of economic activity.ⁱⁱ These ideas are in line with present-day thinking on the Circular Economy, but failed to challenge the dominance of the linear economic model at the time. However, this coincided with the emergence of the environmental movement, as environmental damage from economic activity was becoming more evident and global inequality was a growing concern.

1.3 The **Brundtland Commission** reported in 1987ⁱⁱⁱ and developed international understanding of the idea of sustainable development. Chapter 8 of its report on “Our Common Future” was devoted to “Industry: Producing More With Less”, and gave a strong message on the need for industries to control pollution, make more efficient use of resources, and encourage recycling and reuse – driven on by government regulations and standards. The **Rio Earth Summit** in 1992 gave further impetus to promoting sustainable development among national and local governments as well as the private sector. Some far-sighted **companies** such as Interface Carpets began to change their business models and processes to recycle materials and make more efficient use of energy and water, cutting costs and boosting profits.^{iv}

1.4 At the **national level**, the environmental impacts of **China’s** rapid economic growth have led that country to adopt a more circular approach to industrial development from early this century, aiming to decouple economic growth from resource consumption and pollution, and it is a feature of China’s 12th Five Year Plan for 2011-15.^v Countries such as Japan and others in Europe have for some time set standards for the efficient use of resources, including high levels of recycling and a shift

towards renewable energy sources, but it is realised that this is not enough to ensure future resource security and mitigate the risk of climate change. In 2011 **the EU** made resource efficiency one of its top priorities, recognising the severe challenges of future resource security and declared: *“if we carry on using resources at the current rate, by 2050 we will need the equivalent of more than two planets to sustain us, and the aspirations of many for a better quality of life will not be sustained.”*^{vi} The EU Commission is to announce a package of measures on a Circular Economy before the end of 2015. The **Scottish Government** has meanwhile developed its approach to achieving a Zero Waste Scotland by including a Circular Economy in its **2015 Economic Strategy**^{vii}, and by carrying out a consultation on the topic during August-October 2015^{viii}. The **UK Government**, by contrast, takes a less active approach, by endorsing the work of the industry-led Circular Economy Task Force convened by the Green Alliance, an independent environmental think tank^{ix}.

1.5 **Agencies** working together with the Scottish Government on the Circular Economy in Scotland are Zero Waste Scotland (ZWS)^x, with a focus on waste prevention and resource efficiency; SEPA, focusing more on environmental regulation; and the Enterprise Agencies (Scottish Enterprise, Highlands & Islands Enterprise), interested in the opportunities for economic growth, innovation and business efficiency.

1.6 The Circular Economy is therefore becoming mainstream in many debates on the future of economies around the world. This is in part due to the work of the **Ellen MacArthur Foundation** (EMF), established in 2010 to promote the concept of the Circular Economy^{xi}. It has stimulated discussion at the World Economic Forum^{xii} as well as within the EU and individual countries, including Scotland.^{xiii} Scotland became the first nation to join the EMF CE100 group of partner companies, innovators and administrations.^{xiv} High-profile multinational corporations - Cisco, Google, Kingfisher, Philips, Renault and Unilever - are global partners of the EMF.

Main characteristics of the Circular Economy model

1.7 The EMF model of the Circular Economy is widely used by other organisations, and is shown in [Appendix I](#). This model is proposed as a new, disruptive, way of thinking about the economy, which radically alters material flows so that resources are retained in productive use for as long as possible, at the highest possible utility and value, through multiple cycles. Instead of being designed for disposal after use, products are designed and made to be made again, designing out waste, in a system powered by renewable energy. Sharing, re-use, repair and remanufacturing are preferred as they are more resource efficient than disassembly and recycling of materials. Recycling should aim to maintain or increase (“upcycle”) the value of these materials, rather than the low value recycling which is widespread currently. Materials or chemicals that obstruct reuse and recycling should be replaced where possible. Negative environmental impacts are identified and designed out, with a restorative approach to the management of natural resources.

1.8 A separate model developed by the EU emphasises the **importance of design** at an early stage in the cycle. This is essential not only to create products which are durable and easily repaired or recycled, but also: to reshape business models to make the best use of resources; to redesign supply chains to facilitate collaboration among suppliers and customers; to create repair, collection and return systems for materials; and to reshape labour markets to ensure the provision of new types of skills. An example of applying a design perspective to the challenges of waste and the opportunities in a circular economy is the RSA “Great Recovery” project.^{xv}

1.9 Circular Economy **approaches tend to differ**, according to the organisations and countries involved. Energy, food and agriculture are given little or no attention in some interpretations. Government and its agencies currently promoting the Circular Economy in Scotland do not give explicit attention to renewable energy in their approach, perhaps feeling that this is adequately covered by other policies, although it is recognised in the EMF preliminary report on Scotland^{xvi}. There is also limited reference to reduction in environmental impacts, although (at the behest of Scottish Government) ZWS has carried out useful research to show the potential greenhouse gas emission reductions from a circular economy through reductions in waste, processing and resource extraction^{xvii}.

1.10 Among non-governmental organisations, the **Scottish Forum on Natural Capital** is keen to find out more about the Circular Economy approach and how it might help maintain and restore stocks of natural capital, and it is understood that Scottish Government is working with the Forum on this. At a wider level, **Friends of the Earth Europe** campaigns on resource use, calling for Europe to measure and reduce its use of resources to an equitable and sustainable level. It highlights how communities can play a leading role in making the Circular Economy work, through local initiatives such as repair cafes and shared-ownership schemes.^{xviii} This ties in with the work of the **Scottish Community Resources Network**, which represents over 120 community recycling and reuse organisations across the country, and is actively interested in the development of the Circular Economy in Scotland. The **Green Alliance** has also identified the social benefits (jobs, longer-lasting products) of the Circular Economy.^{xix} These non-governmental organisations are therefore keen to see both the environmental and social dimensions of the Circular Economy being articulated along with the economic opportunities. In contrast, the EMF has a strong emphasis on the business angle.

1.11 In conclusion, three points are worthy of emphasis.

- Firstly, whilst the attention given to the concept of the Circular Economy has increased significantly within the past decade, there is little consistency in how it is understood. Different organisations each have their own **perspective** on the meaning of the Circular Economy and how they should engage with it, shaped by their own organisational remit and priorities. Often, as will be shown in the next section, the environmental benefits do not feature highly in individual organisational perspectives.
- Secondly, the Circular Economy **should not be presented as an absolute**. There is a Circular Economy model, and a Circular Economy approach, but a completely circular economy is an objective that can be pursued but never attained. There will always be some leakage of waste out of the economic system. Some items will not be cost-effective to repair, or dismantle and collect for recycling, even though good design can minimise this waste. The Circular Economy should therefore be regarded as a relative concept. We already have some recycling, sharing, and repair of materials and products within what is still a predominantly linear economic system. There can be no sudden transformation from a Linear Economy to a Circular Economy, but rather a transition towards a *more* circular economy. This makes it particularly important to be able to measure the degree of circularity within an economy through **indicators** of resource use and resource productivity, and to distinguish between renewable and non-renewable resources.
- Thirdly, moving towards a more circular economy **may not ensure a reduction in resource use**, only a reduction in the rate of increase in resource use, if it is combined with continued

commitment to economic growth. Clearly this affects the extent to which there will be environmental benefits, although the change in attitudes to the value of resources and the natural environment that should accompany a shift to a more circular economy, in addition to improved resource efficiency itself, should lead to reduced impacts on the environment. These aspects are discussed in the next section.

2. Strengths and weaknesses of the Circular Economy concept from an environmental perspective

2.1 There is, clearly, a good business case for moving to a more circular economy, but it can be argued that the environmental and resource constraints of Planet Earth make it a necessity. Indeed, this expectation was at the heart of the Brundtland Report (although it did not refer to a circular economy as such), and it is explicit in the approaches of the EU and China. Some corporations which are working with the EMF are keen to present the environmental as well as the business benefits. Unilever, for example, has recently completed its ambitious transition to “*zero non-hazardous waste to landfill*”, whilst also reducing its CO₂ emissions by over a third, at the same time as growing its business by 25%.^{xx}

The main environmental benefits which emerged from the circular economy literature are as follows:

- Reduced rates of extraction of natural resources, and associated impacts
- Reduced levels of pollution from industrial activities, as waste outputs are minimised
- Reduced waste requiring disposal, whether from production processes, end-of-life disposal of products, or inefficient distribution systems e.g. for food and other short-life goods
- Reduced energy use and CO₂ emissions, as evidenced in ZWS report
- Improved land productivity and soil health
- Reduction in litter and fly-tipping

In some cases where environmental benefits are cited, it is not clear whether reductions refer to reduced rates or absolute reductions. The more fully circular the economy, the greater should be the environmental benefits.

LINK members’ perceptions of a circular economy

2.2 Views of LINK members on the strengths and weaknesses of the Circular Economy and its relevance to their work were sought through a survey (n=30, 81% response rate) and a workshop. The full list of workshop responses are in Appendix II and survey responses are available in a separate report.

The concept of the circular economy was not particularly well known amongst LINK members, with 21% of respondents reporting that their understanding was good, 34% fair and 45% negligible. One quarter of members had used the concept in their work or operations (promoting a deposit return system; renewable energy generation and waste reduction in offices/properties; promoting the re-use of buildings; promoting closed loop farming and landuse systems; reducing fossil fuel use by

encouraging active travel) and most respondents saw elements of the concept to have relevance to their work and to the work of LINK as a whole.

2.3 LINK respondents identified the following benefits of a circular economy as being most relevant to their organisation:

- The potential of the Circular Economy to lead to reduced resource use and reduced environmental impact from economic activities (n=20) - *'emphasis on reducing resource extraction', 'taking simple steps to cut down on waste', 'it offers a potentially coherent approach to resource use that could help reduce environmental impacts', 'large carbon emissions reduction potential', 'reduced adverse ecological impact and potential benefits to biodiversity', 'air pollution and CO2 emissions', 'less litter in the marine environment'*
- As a neat concept (n=3) - *'it is an easy concept to grasp and a sensible one', 'the circular economy offers a vision which many people can buy into'.*
- The connectivity it offers between the environment and economy (n=2).

Other comments in the survey and at the workshop identified additional potential benefits:

- A more circular economy has associated social wellbeing and health benefits.
- It can be linked to sustainable and local food production and is compatible with maximum sustainable yields.
- There is the opportunity for it to be used to recognise the embedded energy in the built environment and justify energy efficient alternatives to demolition and new build.

2.4 These suggestions illustrate the **wide range of potential benefits** which a comprehensive commitment to a more circular approach to the economy might provide, looking at the inter-relationships with environmental and social conditions.

2.5 When asked to indicate what most concerned them about the Circular Economy, survey respondents identified:

- Cultural obstacles (n=6) - *'The cultural shift required by society is the biggest obstacle', 'it may do little to challenge GDP as the predominant measure of success', 'may focus on above the line actions only – i.e. efficiency strategies which make sense in current economic model ...'*
- Implementation difficulties (n=4) - *'(there are) limited opportunities for delivering change', 'that it will just become another policy statement and not lead to any significant change in behaviour and actions'*
- Other concerns (n=16) - *'It can be 100% circular but still damaging if consumption continues to increase', 'lack of connectivity (to other policy areas)', 'lack of mention of agriculture as an area of the economy where significant contribution could be made to a more circular economy', 'the lack of redress for existing negative environmental effects', 'upfront costs'.*

Workshop participants also identified a number of (in many cases similar) weaknesses about the concept, (full list in Appendix II):

- That there could be a lack of commitment among proponents to pursuing the environmental benefits and reducing resource use;

- Practical difficulties in implementation;
- the way in which the concept is defined by the Scottish Government; and
- the need, if it is to be measured properly, to include footprint metrics as key indicators.

2.6 With Government and business yet to demonstrate their commitment to achieving the environmental benefits, alongside the practical challenges involved, there is a degree of **ambivalence** about whether or not the use of the Circular Economy concept offers important benefits for the environment. The overall feeling was that *“it sounds good in principle, but we’re not convinced there is sufficient commitment to implement it fully.”*

2.7 Significant **barriers to a circular economy** have been identified, for example in a Chatham House report which indicated the need for *“a profound change in industrial practice and patterns of consumption.”* Industrial infrastructure and supply chains are highly dependent on fossil fuels and geared to a linear model, and there are high up-front costs to businesses attempting to transform their business model and processes. Political and vested interests can obstruct pricing of resource use to reflect environmental impacts and scarcity, and consumers themselves may resist the changes needed. Rapid innovation in materials technology, product design and tracking are all needed, and will require commitment from business. Such barriers suggest why the emphasis is being placed by most proponents on the business opportunities rather than the environmental imperatives, to try and stimulate businesses to make these commitments.^{xxi}

2.8 Currently, the main proponents of the Circular Economy around the world are not proposing an absolute decrease in the levels of material use, or a reduction in personal consumption levels, with the Circular Economy being presented as a means of **continuing economic growth** whilst utilising resources more efficiently. Whether any of them regard this emphasis on resource efficiency as a politically and culturally acceptable first step towards the potentially less popular next step of reducing overall levels of resource consumption is not known, as they don’t speak about this. Certainly doubts were cast by one interviewee regarding the commitment of at least two EMF Global Partners to fundamentally change the way they do business, and genuinely embrace the circular economy principles, rather than adopting specific circular economy practices where it made business sense and using this for PR benefit.

2.9 The Circular Economy is therefore generally promoted by governments around the world for its potential to boost business growth, profitability and innovation. The **business dimension appears to be given a greater emphasis than the environmental dimension** by Scottish Enterprise and the Scottish Government (in contrast to an earlier SPICe report^{xxii}), and by the Ellen MacArthur Foundation, perhaps concerned in case the concept is dismissed by businesses and the public as a green fringe initiative. Instead of using it to demonstrate the vital need to develop the economy in harmony with the environment, the focus is primarily on the economic potential as well as the reduction in waste and resource costs. The EU Commissioner for the Environment, **Karmenu Vella**, acknowledged this tension in an address to a conference on the Circular Economy in June 2015:

“If there is one thought that I would like you to go away with, it is that with the right information, such as that which Ellen has provided today, the circular economy is an easy sell. On employment, on services, on security of supply it makes sense. Once we convince our

people, our consumers, that it is in their best interest, it will be much easier to convince them why it is in the environment's best interest too.^{xxxiii}

2.10 At the **Scottish Resources Conference** discussion on the Circular Economy held on 8 October 2015, a spokesman from a major resource management company, Viridor, took part in the final panel discussion. He argued that the evidence showed that people's interest in environmental issues is at a 14-year low. He said the case [for a circular economy] should be made by emphasising the costs of landfill etc, and moving it from an environmental case to an economic one. Current approaches suggest there is real resistance in commercial circles to acknowledging that economic and environmental arguments can be publicly aligned, notably in the Circular Economy concept, and it is important that Government should actively champion such an alignment. **It could be an opportunity to mainstream the environmental imperatives**, not to ignore them: to challenge those who believe that protecting the environment is inevitably at the expense of the economy.

3. Public policy issues around the Circular Economy in Scotland

3.1 There are limitations to what the Scottish Government and its agencies can achieve in isolation in seeking to encourage a more circular economy. Many of the policies which will support or obstruct this process are shaped at the EU level, particularly in relation to waste management and recycling targets, and a framework for measuring progress, with the new package of measures due to be launched late in 2015. The implementation of EU waste legislation is devolved from Westminster to Scotland and, if it wishes, the Scottish Government is able to set targets which exceed EU requirements. One of the areas of debate in Scotland and across the EU is the extent to which recycling targets should be advisory or obligatory; setting obligatory targets would give a clearer indication that Government is taking resource efficiency seriously. Businesses would prefer voluntary agreements and to focus on areas of greatest business opportunity rather than greatest environmental and public benefit. Responsibility for meeting municipal waste management targets falls on local authorities, and obligatory EU targets have driven improvements in recycling levels and the diversion of waste from landfill.

3.2 **Scottish Government policy** has moved towards cautiously adopting the Circular Economy model over recent years, supporting research and discussion to build on the established Zero Waste policy and institutional structure. It is included in the Scottish Government's revised economic strategy, launched in March 2015, although it is rather tucked away on page 47 despite the potential it offers to improve productivity, one of the strategy's main objectives. Whilst a lot of research has been carried out into the opportunities for the Scottish economy as well as at an EU level, and there are excellent examples of companies which have benefited from adopting a circular approach to resource use, **real evidence is still needed** of the ability of whole sectors to make the adjustment and reap the expected rewards. Adoption of the model is still therefore somewhat tentative and whilst it is currently led politically by the Environment Secretary, it remains to be seen to what extent support and action are forthcoming across other Ministerial portfolios.

3.3 The current approach to the Circular Economy by the Enterprise Agencies focuses on **particular sectors**. There are plenty of barriers, as mentioned in the previous section, which would impact on sectors with complex international supply chains. Some sectors such as food and drink, medical instruments, and the decommissioning of oil and gas installations should lend themselves

more readily to the circular economy approach. The aerospace sector in Scotland has for many years practised the reconditioning of high-cost aircraft parts. This should also work with an oil platform, instead of it being sent to scrap^{xxiv}. Medical instruments are reconditioned in the US, but the NHS is against this in the UK, despite the financial savings it could provide. There are already good examples in the whisky industry of waste heat and by-products being reused, which other food and drink producers could learn from.

3.3 Among LINK and its members, there is a widespread recognition (confirmed by the survey of members) that a policy which can lead to a reduction in impacts on the environment **would be welcomed by LINK**. Furthermore, a specific proposal for the introduction of a deposit return system (DRS) for single-life drinks containers, which could dramatically reduce littering in the countryside, is promoted by the Association for the Protection of Rural Scotland, and actively supported by a number of other LINK members. The aluminium industry, however, claims that this would not work in Scotland because the smuggling of containers from England would upset the economics of the DRS, which would itself disrupt the operation of municipal waste collection systems, at a time when efforts are being made by ZWS and local authorities to achieve greater consistency.^{xxv} This example illustrates the complexities and different stakeholders involved when trying to tackle a specific area of public policy.

Scottish Government consultation

3.4 LINK's input to the consultation on Creating a Circular Economy in Scotland^{xxvi} was informed by this report and included the following points.

3.5 The consultation document referred to the benefits for tackling climate change and preserving natural capital as one of the reasons for pursuing a Circular Economy, but failed to recognise the urgency of either of these issues. Importantly for environmentalists, there was no commitment in the consultation document to achieving an overall **reduction in resource use**, and there was no section on "reduce", which is the top of the waste hierarchy, to precede the sections on Design, Reuse, Repair, Remanufacture and Recycling. **Missing aspects** of a fully circular economy included built infrastructure, food production and soil quality, marine resources and renewable energy (other than in a corner of a diagram). The section on **Measuring Progress** was based on waste management measures, with the welcome addition of a Carbon Metric for material consumption and waste, but no mention of using ecological, land or materials **footprint measures** to indicate overall levels of environmental and resource impacts. Nor was there an appreciation of the associated social, health and well-being benefits suggested by LINK members. So some LINK members have commented that the consultation **undersold the Circular Economy**, illustrating the limitations of the Scottish Government approach despite its stated ambition to become an international exemplar and to contribute to the EU's consideration of its own Circular Economy Package.

3.6 The consultation document displayed the constraints of a **departmental approach** to policy formulation, when a more systemic approach is required with greater evidence of cross-departmental involvement. Such an approach should find favour with other ministers in the Scottish Government and could do justice (merely by using cross-referencing) to **other important policy priorities** such as social fairness, rural policy and land reform, the planning review, community empowerment and renewable energy development.

3.7 At the time of writing this report, a new SG circular economy strategy is being developed based on the results of the consultation exercise.

4. Recommendations

Drawing together the conclusions from the preceding analysis, the following recommendations are presented.

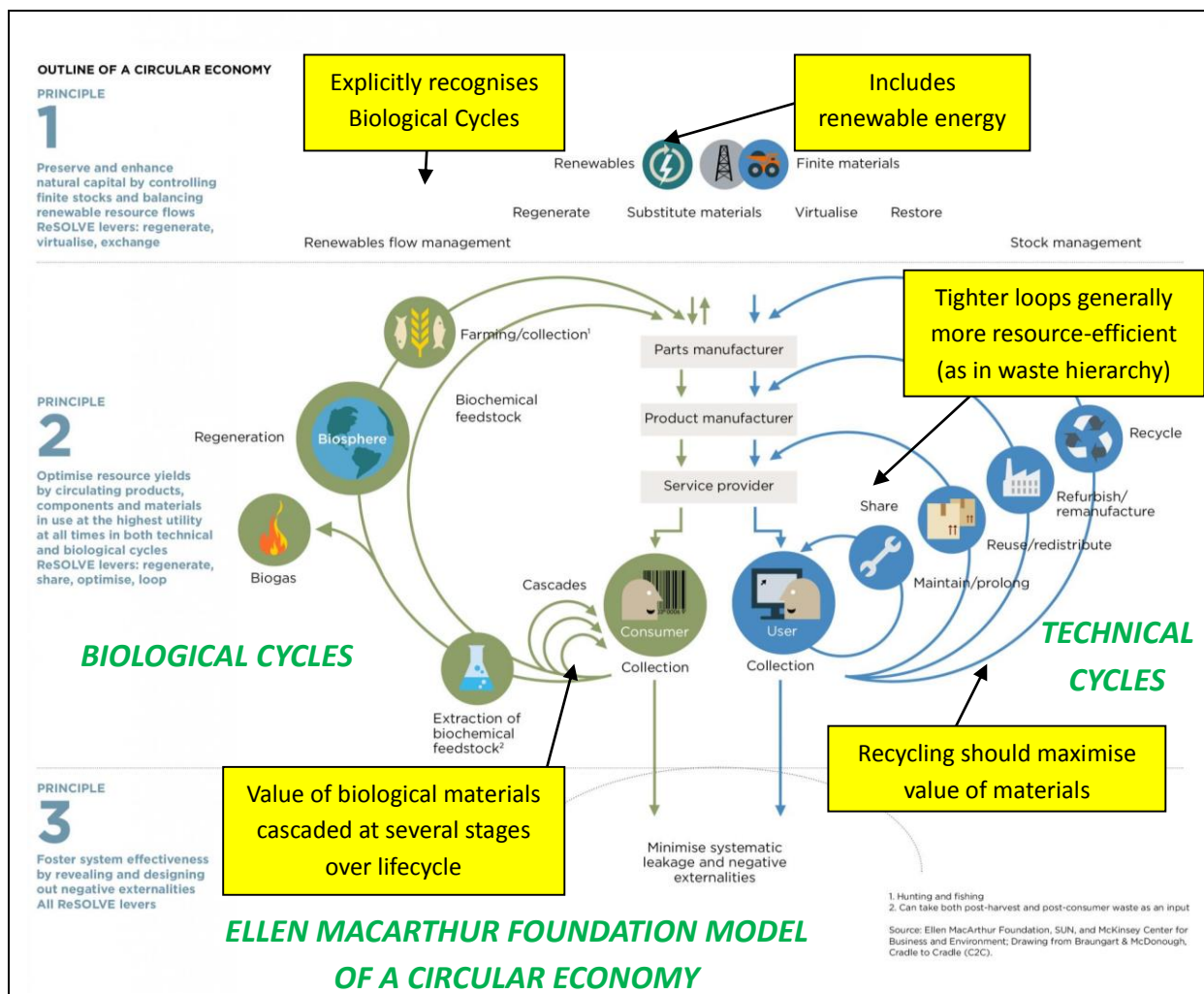
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APPENDIX I – ELLEN MACARTHUR FOUNDATION MODEL OF A CIRCULAR ECONOMY

The EMF model of the Circular Economy (see Figure below) is widely used by other organisations, including the Scottish Government. The following features should be noted:

- It shows both the “technical cycle” with mineral resources and manufacturing, alongside the “biological cycle” of once-living materials (crops, livestock, forestry, marine resources).
- It includes reference to renewable energy, which displaces use of finite fossil fuels.
- The tighter the loops are shown, the more resource efficient they tend to be, with sharing making the most of products, which should have their useful lives prolonged through maintenance and repair or reuse, before being refurbished or remanufactured if possible, and ultimately having the component materials recycled, as in the waste hierarchy.
- When materials are recycled, their value should be maintained or even raised where possible.
- In the case of biological materials, these can often go through a series of processes, or cascades, to extract value in different ways, including eventual conversion to energy or soil nutrients.
- The system should minimise leakage of waste, where thermal treatment is preferred to landfill.
- The model also indicates the role of the service provider, who retains responsibility for products to maximise their useful life, rather than transferring ownership to the user.



NB: yellow text boxes and green text have been added for this report

APPENDIX II – LINK WORKSHOP SWOT ANALYSIS, 7 OCTOBER 2015

NB These responses have been clustered after the workshop, with the subheadings in italics added

Implications of the Circular Economy approach for the Environment: Strengths - 23

3 comments on how it connects the economy and the environment

- Connects economy and environment
- Links environmental benefits with social & economic benefits
- The economic benefits will help promote the environment

Another 3 on how it could be attractive and relevant to business and the economy, and drive behaviour change among corporates

- Broad concept that has relevance to most aspects of the economy
- Can be made attractive to business
- Potentially a strong driver of behaviour change among corporates

Most common comment was about the importance of reducing resource use which is vital for a sustainable future

- Encouraging debate on how to improve/innovate/enhance production systems
- Reduced resource use is vital for a sustainable future
- Focus on all specific parts of resource use in product cycle
- Would encourage greater self sufficiency and less direct waste
- Enables challenge to existing patterns of resource use and consumption
- Could be helpful in developing understanding of our unsustainable resource use
- At its broadest, it is helpful in highlighting environmental impacts of production and consumption and the need to address them.

Seven references to the positive environmental impacts, in general and with specific reference to CO2 emissions and biodiversity

- Environment impacts all positive – great stuff!
- Potentially tackles root causes of much environmental degradation
- Lots of potential gains for biodiversity and reduction of resource demands
- Reduced impact on biodiversity
- Reduced CO2 emissions
- Natural resources used in sustainable quantities and accounted for

- Numerous win/win/win changes available

Three related to communications – two about it being an accessible concept and could be communicated as “common sense”. The third

- Accessible concept – probably easier to understand alongside austerity backdrop
- The concept can be communicated as “common sense”
- If communicated well & public engagement achieved, then there could be huge social and community advantages such as cohesion, support, environmental responsibility, less materialism etc. A long shot though.

Implications of the Circular Economy approach for the Environment:

Weaknesses: total 17

Lack of commitment to environmental benefits

- Fails to challenge economic growth model
- Continued focus on GDP as indicator of economic success
- Too focused on reuse, recycle etc rather than reducing use
- It won't be applied across the board but only where economically palatable
- The strong economic strand of CE could overshadow the environmental arguments
- Some of the [initiatives?] are likely to enable and encourage continued high levels of consumption
- Allows businesses to brand themselves green without fundamental change

Practical difficulties

- Political barriers – lack of engagement and short-termism
- The Scottish Government is a small player in the global resource economy
- Easy to say, difficult to do. Requires big buy-in from Government, business, society
- Huge challenges in achieving “high value” in manufacturing – skills, training, design implications

Difficulties with the concept

- False suggestion that we can be fully circular
- Risk of distraction – badging an issue rather than improving system(s)
- Scottish Government consultation – focus on “things”. Should take a step back (to EMF picture) on principle

Measurement

- May not result in improvements to the environment if it only looks at efficiency and not footprints

- Detracts from attention to overall footprints

Communications

- Not a very clear term for public use

Implications of the Circular Economy approach for LINK and its members:

Opportunities - 17

Means of promoting LINK objectives

- Vehicle for introducing opportunities for change, e.g. in agriculture and land use
- Can be used as an argument for some campaigns, i.e. on litter, sustainable agriculture/food
- Could be helpful to Agriculture TF in work on food and farming, e.g. in relation to input use, waste, etc
- Cross-sectoral support for common objectives is possible, lending them political weight
- Using Economic and Social benefits as a “trojan horse” to advance Environmental objectives
- All wins for what concerns us – decarbonisation, resource efficiency, biodiversity gains, less pollution (is implied), perhaps more fairness in society, potential gains in food sector
- Individual members can encourage further debate on role of re-using buildings in regeneration/ community/ social - wellbeing / place-making
- LINK members should be engaging with any efforts to better our environment

Means of communicating more widely

- Possibly a way of talking to business
- Opportunity to engage new audiences and make them aware of LINK/members’ work
- Opportunity for LINK to engage with parts of the Scottish Government not usually met
- Potential to engage wider range of MSPs and Ministers in environmental issues – often seen as outside their portfolios

Means of increasing LINK’s influence

- An important element of LINK’s engagement with the economic debate
- LINK could present a strong coherent and united support – this would emphasise our strengths for the advocacy required in promoting the CE
- May offer an opportunity for a LINK campaign if key aspects can be identified
- Good political support behind the concept, chance to capitalise
- Helps LINK present a coherent narrative

Implications of the Circular Economy approach for LINK and its members:

Threats - 13

Enticed into supporting something that does not offer real change, inconsistent with LINK's principles

- LINK may be endorsing businesses and practices which are not very environmental
- If LINK supports it, but it is played out with an economic focus rather than environmental
- Possible conflict with focus on Beyond GDP and other wellbeing measures
- Lack of recognition of Natural Capital being maintained, as underpinning principle

Does not offer real change, or would be difficult to deliver

- Threat that it is a token system for businesses to “green” themselves and Scottish Government to look like they are doing something, but superficial and lacking the will to change systems. (i.e. LINK should advocate elsewhere)
- May distract Government from doing what they should be doing – effective implementation of existing legislation. Passing the buck to business who will tinker around the edges
- Government support ends up being piecemeal and not followed through in the sectors important to LINK members

Beyond scope of LINK's work, resources and expertise

- Most LINK members have a narrow “Scottish” environmental area of interest, and this is a global issue
- LINK talking outside of members’ comfort zone and expertise
- Further stretches LINK and members’ capacity – already overstretched

Unhelpful distraction

- May distract from our focus on other priorities
- May distract attention and resources from other more important themes

Would not help to increase LINK's influence

- Predictability – “them again” (response of politicians etc)

APPENDIX III – ALTERNATIVE ECONOMIC MODELS

Reference is made in the report to an alternative but complementary approach, the “**Resource efficient green economy**”. This is explained in a report from the **European Environment Agency** (2014)^{xxvii}. It defines the green economy as “*one in which policies and innovations enable society to use resources efficiently, enhancing human well-being in an inclusive manner, while maintaining the natural systems that sustain us.*” It makes the point that the Circular Economy concept “*is connected to the green economy; it is narrower in scope as it refers mainly to physical and material resource aspects of the economy – fuel, minerals, water, biomass, etc. It does not place emphasis on human well-being or social inclusion rather it focuses on recycling, limiting and re-using the physical inputs to the economy, and using waste as a resource, leading to reduced primary resource consumption. As such, the circular economy concept supports directly the resource-efficiency dimensions of green economy objectives.*”

The “resource efficient green economy” sounds rather like what many environmentalists might understand as “sustainable development”, recognising the social dimension alongside economic and environmental imperatives. This concept has the disadvantage that it is championed by an international environmental agency, and as such has a relatively low profile, compared with the concept of the Circular Economy which is endorsed by Governments and a number of leading multinational corporations, and features on the agenda of the World Economic Forum.

Another alternative economic model is “**The Economy for the Common Good**”, developed by the Austrian, Christian Felber^{xxviii}, and set out in his book of that title (in German) published in 2008, now available in English. This aims to reorientate the economy by removing the market dynamics that promote the linear model and short-term shareholder interests and forcing companies to reassess their success in terms of the common good. Tax and import incentives would be used to move to a more circular and social economy. The Common Good Values are: Human Dignity; Co-operation and Solidarity; Ecological Sustainability; Social Justice; and Democratic Co-Determination and Transparency. Stakeholders are not just the business employees, owners and investors, but also the suppliers, the customers and business partners, and the social environment including future generations. A matrix of performance based on these values and stakeholders generates a Common Good Balance Sheet for companies. Supportive municipalities and national governments would use their procurement procedures to favour suppliers with high scores on this Balance Sheet, encouraging businesses to modify their corporate policies to improve their scores, in order to compete for contracts.

APPENDIX IV – LIST OF INTERVIEWEES etc

Thanks to the following individuals for taking part in interviews to assist with this investigation:

Dan Barlow Meadhb Bolger	Senior Researcher, Climate Change and Resource Use, Scottish Parliament Resource Use Campaigner, FoE Europe (written feedback)
Mike Elm	Project Officer, Scottish Forum on Natural Capital
Matt Lewis Ewan Mearns Jon Molyneux Anonymous	Projects and Membership Officer, Community Resources Network Scotland Senior Manager, Strategy & Economics, Scottish Enterprise Head of Communications and Engagement, Zero Waste Scotland Three individuals with expertise in the Circular Economy approach

Participation and various discussions at two events to inform this investigation:

- Scottish Forum on Natural Capital, Circular Economy Roundtable, 9 September 2015
- Scottish Resources Conference 2015, Circular Economy, 8 October 2015

Thanks also to participants in the Workshop for LINK members on 7 October 2015:

Phoebe Cochrane	LINK, Sustainable Economics Policy Officer
Matthew Crighton	Friends of the Earth Scotland
Charles Dundas	Woodland Trust Scotland
Mike Elm	Scottish Wildlife Trust
Beryl Leatherland	Scottish Wild Land Group
Eilidh Nicolson	National Trust for Scotland
Vicki Swales	RSPB Scotland

LIST OF REFERENCES

ⁱ See for example Vance Packard's 1960 book *The Waste Makers*, and the Club of Rome's 1972 report, *The Limits to Growth*.

ⁱⁱMore about Walter Stahel, see: https://en.wikipedia.org/wiki/Walter_R._Stahel

ⁱⁱⁱWorld Commission on the Environment and Sustainable Development, 1987, "Our Common Future". See: <http://www.un-documents.net/our-common-future.pdf> and

http://www.un.org/wcm/webdav/site/climatechange/shared/gsp/docs/GSP1-6_Background%20on%20Sustainable%20Dev.pdf

^{iv} See the story of Interface's conversion to a low impact business model, at: http://www.interfaceflor.co.uk/web/sustainability/mission_zero, and its current approach to minimising environmental impacts at: <http://www.interfaceflor.co.uk/web/sustainability/gobeyond>

Also relevant is the 1998 approach to achieving "Factor Four" improvements in resource efficiency (later raised to "Factor Ten"), see: https://www.iisd.org/business/tools/principles_factor.aspx

^v Dajian, Z, 2014, *China's policies and instruments for developing the circular economy*, available at: <http://europesworld.org/2014/06/15/chinas-policies-and-instruments-for-developing-the-circular-economy/>

also The Clean Revolution, 2012, *Delivering Low Carbon Growth: a Guide to China's 12th Five Year Plan*, available at <http://thecleanrevolution.org/publications/delivering-low-carbon-growth-a-guide-to-chinas-12th-five-year-plan/>

and Collot d'Escury, A, 2014, *Can China kickstart its circular economy and kick its smog?*, The Guardian, available at: <http://www.theguardian.com/sustainable-business/china-recycling-waste-circular-economy>

^{vi} European Commission, 2011, *Roadmap for a Resource Efficient Europe*, page 1, available at: <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52011DC0571>

^{vii} Scottish Government, 2015, *Scotland's Economic Strategy*, available at: <http://www.gov.scot/Resource/0047/00472389.pdf>

^{viii} Details of Scottish Government Consultation available at: <https://consult.scotland.gov.uk/zero-waste-delivery/making-things-last/>, including a list of links to documents illustrating the range of work carried out investigating the Circular Economy in the lead-up to the consultation exercise. The consultation document itself can be accessed at: https://consult.scotland.gov.uk/zero-waste-delivery/making-things-last/supporting_documents/makingthingslast.pdf

^{ix} Circular Economy Task Force described at: <http://www.green-alliance.org.uk/CETF.php> .

The Green Alliance has frequent blog posts on the Circular Economy at: <http://greenallianceblog.org.uk/category/resource-stewardship-2/circular-economy/>

The UK Government was urged to take a more active role assisting moves to a more circular economy by the House of Commons Environmental Audit Committee in the report of its inquiry into Growing a Circular Economy: Ending the Throwaway Society, available at: <http://www.publications.parliament.uk/pa/cm201415/cmselect/cmenvaud/214/21402.htm>

^x See Zero Waste Scotland coverage of the Circular Economy at: <http://www.zerowastescotland.org.uk/our-work/circular-economy>

See also evidence from ZWS and Scottish Enterprise to Scottish Parliament Rural Affairs, Climate Change and Environment Committee on 14 May 2014, reported at: <http://resource.co/resource-use/article/circular-economy-should-be-%E2%80%98top-priority%E2%80%99-scotland>

^{xi} The EMF website is at: <http://www.ellenmacarthurfoundation.org/> with much detailed material explaining its approach to the Circular Economy

A BBC *In Business* programme from April 2015 (30 minutes), including an interview with Ellen Macarthur, explains the background to the Circular Economy, available at: <http://www.bbc.co.uk/programmes/b05r40r7>

A talk Ellen MacArthur gave to TED in March 2015 (17 minutes) is available at:
http://www.ted.com/talks/dame_ellen_macarthur_the_surprising_thing_i_learned_sailing_solo_around_the_world

^{xii}The World Economic Forum Circular Economy project page is at
<http://www.weforum.org/projects/circular-economy>

A January 2014 report produced by the WEF with the Ellen MacArthur Foundation and McKinsey setting out the economic opportunities is available at: <http://reports.weforum.org/toward-the-circular-economy-accelerating-the-scale-up-across-global-supply-chains/an-economic-opportunity-worth-billions-charting-the-new-territory/>

^{xiii}The latest EMF report, *Growth Within: A Circular Economy Vision for a Competitive Europe*, focuses on three sectors: mobility, food systems and the built environment. Available at:
<http://www.ellenmacarthurfoundation.org/assets/downloads/circular-economy/Growth-Within-Report.pdf>

Earlier EMF reports on the Circular Economy can easily be accessed at:
<http://www.ellenmacarthurfoundation.org/publications>

Ellen MacArthur Foundation 2014 preliminary report on the opportunities for a circular economy in Scotland, available at: <http://www.ecoconnect.org.uk/publications/scotland-and-the-circular-economy-ellen-macarthur-foundation/>

^{xiv}See: <http://www.ellenmacarthurfoundation.org/news/scotland-become-first-nation-in-ce100>

^{xv}See: <http://www.greatrecovery.org.uk/about-us/>

Design is a key feature in EMF reports. One focuses on the design requirements for a mobile phone in the Circular Economy, available at:
<http://www.ellenmacarthurfoundation.org/assets/downloads/final-CEIP-report.pdf>

^{xvi} See: <http://www.ecoconnect.org.uk/publications/scotland-and-the-circular-economy-ellen-macarthur-foundation/>

^{xvii} Zero Waste Scotland, 2015, *The Carbon Impacts of the Circular Economy*, available at:
<http://www.zerowastescotland.org.uk/CarbonImpactsOfTheCircularEconomy>

^{xviii} See: https://www.foeeurope.org/sites/default/files/resource_use/2015/preventing_waste.pdf

^{xix} See the infographic published in August 2015 on the Green Alliance website highlighting benefits for employment and consumers at:
http://www.green-alliance.org.uk/social_benefits_of_a_circular_economy.php

^{xx} Presentation by Tony Dunnage of Unilever to Scottish Resources Conference, 8 October 2015. See coverage on Unilever website at <https://www.unilever.com/news/press-releases/2015/15-01-30-Unilever-achieves-zero-waste-to-landfill-across-global-factory-network.html>

^{xxi} Preston, F, 2012, *A Global Redesign? Shaping the Circular Economy*, Chatham House Briefing Paper, pp. 14-16, available at:
https://www.chathamhouse.org/sites/files/chathamhouse/public/Research/Energy,%20Environment%20and%20Development/bp0312_preston.pdf

^{xxii} SPICe briefing on a Circular Economy, 2013, available at:
http://www.scottish.parliament.uk/ResearchBriefingsAndFactsheets/S4/SB_13-72.pdf

^{xxiii} See coverage of “Closing the Loop” conference, at http://ec.europa.eu/environment/circular-economy/index_en.htm, and Karmenu Vella speech at <http://ec.europa.eu/commission/2014->

2019/vella/announcements/closing-loop-conference-circular-economy-introductory-remarks-karmenu-vella-25-june-2015_en

^{xxiv} See coverage of the RSA project, working with Zero Waste Scotland, on the opportunities for materials reuse in the North Sea Oil & Gas Industry, at:
<http://www.greatrecovery.org.uk/resources/new-report-ce-re-use-opportunities-for-oil-gas-rig-decommissioning/>

^{xxv} Zero Waste Scotland, *Charter for Household Recycling*, available at:
<http://www.zerowastescotland.org.uk/content/charter-household-recycling>

^{xxvi} Scottish Government, 2015, *Making Things Last – Consultation on creating a more circular economy in Scotland*, available at: https://consult.scotland.gov.uk/zero-waste-delivery/making-things-last/supporting_documents/makingthingslast.pdf

^{xxvii} The model is explained on Christian Felber’s website at <http://www.christian-felber.at/cv/christian-felber-profile.pdf> and the website for the movement to promote this model is at <https://www.ecogood.org/en>