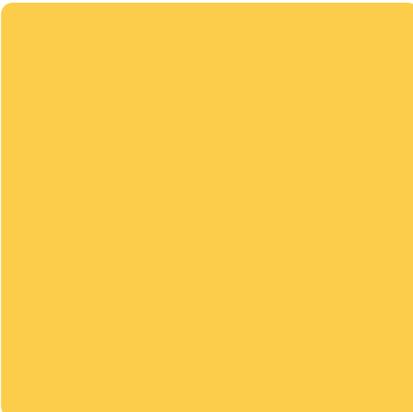


Incremental Circular Economy as a Serious Sustainability Problem

How to turn the focus on circular economy into a driver for global sustainability

DENNIS PAMLIN AND MADELEINE ENARSSON

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into a driver for global sustainability

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Summary

This report explores different ways to understand the relation between business model innovation and a circular economy. The aim is to provide guidance for companies, intrapreneurs in companies and organisations working with circular economy. And, to provide a structure to understand very different approaches and their outcomes.¹

First, let us acknowledge that the relationship between business model innovation and circular economy is complex and rapidly changing, as both “business model innovation” and “circular economy” can be interpreted in multiple ways and are evolving fast.

On the one hand it is obvious that we need to move away from linear material flows in society towards more circular flows. On the other hand, it is also obvious that the way some unsustainable companies, from fast fashion companies to car companies, are using the incremental interpretations of the concept circular economy is diverting the conversation away from their unsustainable business models.

What these unsustainable companies call circular economy is often take-back systems that are incremental improvements of fundamentally unsustainable business models. This is problematic, as it undermines the idea of circular economy as a meaningful tool for sustainability. Even more problematic is the fact that this PR driven work often result in situations when media, conferences and even policy makers and researchers ignore smaller companies with truly sustainable business models invisible.

Even measures and initiatives that many companies and governments call circular have been exposed as unsustainable when China, who used to be the global dumping ground for “recycled” plastic, banned import of plastic waste.² But the same problem has existed for a long time where so called “recycling” schemes is about gathering waste in the rich countries and then export it to poor countries. E-waste to Africa is probably the most discussed problem.³

¹ This paper was financed by the Swedish Environmental Protection Agency and written as a contribution for a project about circular economy with the focus on plastic in providing nutrition/health. For more information: RE:Source and the Swedish Environmental Protection Agency (2018): <https://kompetens-resource-sip.se/wp-content/uploads/2019/01/RESource-innovationst%C3%A4vling-English-version.pdf>. Dennis Pamlin and Madeleine Enarsson are the authors of this report. Valuable contributions were provided by: The participating companies, Eva Dalenstam, Jonas Enebro, Lena Stig, Evalena Blomqvist, Anders Wijkman, Sashin Joshi, Gustav Hedström, Magnus Hedenmark, Mathis Wackernagel, Nette Kirkegaard and many more.

² Katz, Cheryl (2019, March 7): <https://e360.yale.edu/features/piling-up-how-chinas-ban-on-importing-waste-has-stalled-global-recycling>

³ Katz, Cheryl (2019, March 7): <https://e360.yale.edu/features/piling-up-how-chinas-ban-on-importing-waste-has-stalled-global-recycling>

Ottaviani, Jacopo (n.d.): <https://www.spiegel.de/international/tomorrow/electronic-waste-in-africa-recycling-methods-damage-health-and-the-environment-a-1086221.html>

In parallel, there is a growing group of companies that are looking into new business models that are sustainable on a global scale and where the focus is on resource efficiency and circular flows that would be sustainable in an equitable world with 9-11 billion people. These companies are often small and with no PR budget.

Many consultants, journalists, academics and policy makers use PR budgets from the companies with the unsustainable business models for different initiatives. This is probably why we tend to see fossil fuel companies, fast food companies, fast fashion companies and others with fundamentally unsustainable business models in media and on conference stages presented as “sustainability leaders”.

The combination of different approaches by companies to sustainability and different interpretations of a circular economy have resulted in a situation when very different solutions are being promoted under flag of “circular economy”. The solutions range from trying to brand incremental recycling improvements of existing products as significant, to a rethinking of how society is organised to ensure a just transition towards a sustainable economic system with a Half-Earth⁴ vision.

During the industrial era most of the focus has been on adding technologies to address problems without fundamentally changing the way solutions are provided. With the fourth industrial revolution this has changed, and all sectors are now experiencing different levels of disruptions. Solutions in the music industry used to focus on how the physical medium (e.g. CDs) could improve, but digitalisation allowed music to be provided in fundamentally new ways that did not even require a physical medium.

Currently, similar tensions can be seen in many areas. For example, much of the focus in the area of mobility is still on improving the main physical medium for mobility (e.g. cars) and how they can be recycled. However, the ways in which cars can be used are fundamentally changing (through sharing and automatization). Even more disruptive is that much of the physical needs of mobility can be eliminated through digitalisation (teleworking, 3d printing, smart city planning, etc.). What an appropriate focus is, what tools that should be used, what expertise that is needed, and what time-horizon that is appropriate is now longer as clear as it used to be.

The current complexity makes it important to clarify what kind of innovation that is promoted and for what. In order to capture different levels of technology innovations and different levels of business model innovation an innovation matrix can be used, see image 1 below. Such a matrix also helps to identify different combinations of technology- and business model innovation.

⁴ Half-Earth: The idea that if we protect half of the global surface, the fraction of species protected will be 85%, or more. At one-half and above, life on Earth enters the safe zone. Half-Earth can be seen as an ethical starting point for how humanity can live in harmony with nature where nature has an intrinsic value. For more information see: Half-Earth Project, website (2019): <https://www.half-earthproject.org/discover-half-earth/>

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Image 1. Innovation matrix for technology and market

In this paper the “plastic challenge”, with focus on plastics role for nutrition and health in society, is used as a case to illustrate different ways to understand the relation between business model innovation and a circular economy. The findings are based on two main sources of information: desk research and interviews.

Disposition of the paper

The paper is divided in two sections. The first section discusses business model innovation and a circular economy. The first part of this section presents recent trends and present three different approaches to sustainability by companies and its implication for business model innovation:

- Sustainability 1.0: Cost efficiency
- Sustainability 2.0: Green markets
- Sustainability 3.0: Delivering on sustainability

The second part of this section discusses circular economy and its relation to different approaches to solutions. Two aspects relevant for defining and prioritising solutions are discussed:

1. Solution Criteria

We must know what it is that we see as a problem in order to find an appropriate solution. The paper outlines four aspects that are important to clarify in relation to the problem that is to be solved.

2. Overton Windows for Solutions

An important aspect of solutions are how they are perceived in terms of viability. Different groups see different solutions in different ways, ranging from absolutely necessary, to unthinkable. An Overton Window for sustainable solutions is provided based on experience from the climate discussion.

The second section focuses specifically on the plastic challenge. The first part of this section discusses the plastic challenges and the different aspects of this challenge.

- **Direct Environmental Challenges**

The direct environmental challenges cover the impact by the material itself i.e. its contribution to waste and use of non-renewable resources.

- **Indirect Environmental Challenges**

The indirect challenges cover the contribution from the main uses of plastic today i.e. its contribution to a linear economy and to over-/unnecessary consumption.

The second part of this section introduces three categories of circular economy strategies. The three categories are based on the findings on the first section of the paper and through the interviews. The three categories are:

- **Product focus: Avoiding Landfill and Increasing Renewable Materials**

These strategies focus on incremental approaches with short term-improvements of existing products. The drivers tend to be compliance and cost efficiency together with branding. The responsible people leading this work tend to be in charge of compliance and/or marketing. Often this is not really a circular economy approach as the key focus is to ensure that the product does not end up in nature or a landfill in the country where it is sold.

- **Value-chain focus: Product as a Service for Sustainable Resource Efficiency**

These strategies focus on more disruptive approaches with a medium-term perspective that covers the full value-chain. The drivers tend to be life-cycle cost optimization and a basic understanding of the possibilities with digitalization. The responsible people tend to be a broader group within the company linked to product development and sales, often linked to innovation. Here the focus is on circular flows of material, but often ignoring if these material flows are resource efficient and sustainable.

- **Global sustainability focus: Global Sustainable production and consumption as a Goal and Driver**

These strategies include transformative approaches comprising of many smaller initiatives, where the company see sustainability as a driver for innovation and sales instead of an add-on measure to the existing business model. The responsible people tend to include leading individuals and departments from all parts of the company. In order to be successful this approach needs strong support from the CEO and board. Such a strategy provides many new opportunities, but also challenges.

The three approaches can be seen as complementary and as an approximation for sustainability maturity. The focus for the approaches can be described in the matrix below:

	Product focus	Value-chain focus	Global Sustainability focus
Sustainability 1.0: Cost efficiency			
Sustainability 2.0: Green markets			
Sustainability 3.0: Delivering on sustainability			

1. Corporate Approaches to Sustainability

For a long time, the discussion about companies and their responsibility and approach to sustainability was more or less a simple question of yes or no. The dominating view used to be that companies should only focus on maximizing profit for their owners. Those who argued that companies had a responsibility provided many good arguments, but it was almost always based on the fact that such a responsibility in one way or another was profitable, or that the profits could be used for good purposes.⁵

The relationship between business and sustainability is now going through rapid transformations. Not only are new innovative business models emerging in response to the need for sustainability⁶, the very reasons for a company to exist are increasingly being discussed in relation to sustainability challenges.

There are many reasons for the changing relation between companies and sustainability. On the one hand, the need for environmental sustainability is moving from something that can be dealt with after (what used to be seen as the) core needs society has been addressed, such as growth and employment, to a matter of survival for human civilization.⁷ On the other hand, the relevance of traditional core areas, such as growth and employment, are now being questioned by many including mainstream and Nobel prize winning⁸ economists.⁹

The fact that not all economic growth is good is now well accepted, with green and inclusive growth being mainstream policy for most governments and international institutions. The fact that this does not always change the policies by most governments should not diminish the significance that growth is no longer seen as the uncontested goal for societies. An increasing number of experts, including Nobel Prize winners such as Amartya Sen and Joseph Stiglitz, are even calling for a fundamental rethinking of what society should focus on. They even recommend that we should abandon GDP as a measure of social progress.¹⁰

⁵ See for example: Noer, Michael., Ewalt, David M. & Weiss, Tara (2008): https://www.forbes.com/2008/10/16/corporate-social-responsibility-corporations08-lead-cx_mn_de_tw_1016csr_land.html#75f17ae676e3

⁶ Interesting to note is that many new business models have strong links to global sustainability as they are built on modular, sharing, dematerialisation, without those leading the companies think about sustainability.

⁷ Butler, D. Colin. (2018): <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6210172/>
Hurst, Luke. (2019, April 18): <https://www.euronews.com/2019/04/18/financial-system-faces-existential-threat-from-climate-change-central-banks-warn>

⁸ To be correct the prize in economics is not a real Nobel Prize, but The Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel.

⁹ Stiglitz, E. Joseph, Sen, Amartya & Fitoussi, Jean-Paul (n.d.): <https://ec.europa.eu/eurostat/documents/118025/118123/Fitoussi+Commission+report>

¹⁰ Financial Times. (2009, September 13): <https://www.ft.com/content/95b492a8-a095-11de-b9ef-00144feabdc0>

The fourth industrial revolution is also resulting in questions about the future of work and income distribution. But the most important part of this revolution is perhaps the opportunities for totally new ways to provide the services we need and want.¹¹

Climate Change has become a symbol of the need to prioritise sustainability. Even more conservative and business-oriented fora like World Economic Forum are now listing climate change as one of the most important challenges for humanity. The 2019 version of the Global Risks Report listed “Failure of climate change mitigation and adaptation”, and “Biodiversity loss and ecosystem collapse”, at the very top.¹²

When growth is questioned as the overall goal in society, questioning growth and profit as unconditionally positive for companies is a logical next step. There is now a growing consensus that business needs to do more to ensure that business is delivering what is needed in society. While there are many different initiatives and business models that are being explored there is also a more fundamental discussion about the role of business in relation to the major challenges of today taking place in parallel.

Even The Business Roundtable (BRT), a conservative business organisation, recently declared that the purpose of a corporation is not just to serve shareholders (their official position since 1997).¹³ When BRT, on Aug. 19, announced a new purpose for the corporation “to create value for all our stakeholders.” It was a clear indication that the question of purpose driven companies is now becoming mainstream and the reactions were strong.¹⁴

Many NGOs, activists and academics have been discussing the need for a new role for business beyond current CSR initiatives. Anand Giridharadas book “Winners Take All: The Elite Charade of Changing the World” is the latest to trigger a discussion about our current system where many large companies are launching initiatives for sustainability while they through their core business are undermining the same values.¹⁵ An activist, or in this case a journalist, criticising the system is nothing new. What is new is that an increasing number of business people have begun to ask similar questions.

The UN Global Compact was created almost two decades ago, in 2000, with the aim to promote responsible business practices and UN values in the global business community.¹⁶ At the time it was quite radical to ask companies to support a number of basic principles.¹⁷ Today UN Global Compact and many

¹¹ Benioff, Marc. (2017, January 18): <https://www.weforum.org/agenda/2017/01/4-ways-to-close-the-inequality-gap-in-the-fourth-industrial-revolution/>

¹² World Economic Forum. (2019): http://www3.weforum.org/docs/WEF_Global_Risks_Report_2019.pdf

¹³ Business Roundtable, website. (2019): <https://opportunity.businessroundtable.org/ourcommitment/>

¹⁴ Murray, Alan. (2019, August 19): <https://fortune.com/longform/business-roundtable-ceos-corporations-purpose/>

Winston, Andrew. (2019, August 30): <https://hbr.org/2019/08/is-the-business-roundtable-statement-just-empty-rhetoric>

Financial Times. (2019, August 19): <https://www.ft.com/content/e21a9fac-c1f5-11e9-a8e9-296ca66511c9>

¹⁵ Chakraborty, Aditya. (2019, February 14): <https://www.theguardian.com/books/2019/feb/14/winners-take-all-by-anand-giridharadas-review>

¹⁶ Wikipedia, website. (2019): https://en.wikipedia.org/wiki/United_Nations_Global_Compact

¹⁷ United Nations Global Compact. (2019): <https://www.unglobalcompact.org/what-is-gc/mission/principles>

other organizations working with companies and sustainability are struggling to keep up with the changes as some companies move their sustainability work from risk and compliance to sustainability as a driver for business innovation.¹⁸

Today many professionals responsible for sustainability are sitting in a CSR department where they are responsible for operational risk. This reactive position is important, but such a position makes it hard to engage in anything related to core business development. More worrying is the fact that many professionals responsible for CSR are also responsible for PR. Among those we see unsustainable business practices hidden behind creative communication initiatives, from offsetting to engagement in any initiative that does not require them to make any significant changes in their unsustainable business practices.¹⁹

Encouraging, and perhaps surprising, is that an increasing number of CEOs are now asking more profound questions. Paul Polman, the former CEO of Unilever, has been leading the discussion for many years by highlighting that business should have a purpose that is related to what is needed in society. In a landmark article, with the heading “Captain Planet“ in Harvard Business Review back in 2012 he discussed his views on the role of companies.²⁰ In this article he also said that many wanted him to fail as they did not like business to have a role beyond making profit.

Some thought it was provoking when he said that he wanted to be part on the solution, not just be less of a problem “We thought about some of the megatrends in the world, like the shift east in terms of population growth and the growing demand for the world’s resources. And we said, “Why don’t we develop a business model aimed at contributing to society and the environment instead of taking from them?”²¹

Increasingly NGOs and think tanks are increasingly addressing CEOs instead of only the CSR responsible when addressing sustainability challenges, including circular economy.²² How much of this that is serious engagement with CEOs and how much that is a marketing ploy remains to be seen.

For many years Polman was pretty much alone as a CEO for the largest companies in reflecting on the role of companies. Other leading CEOs in the sustainability field focused more on the PR aspects, like Richard Branson who promised quite a lot but delivered little.²³ Even more problematic than the lack of funding put forward by Branson is probably his lack of trans-

¹⁸ Nidumolu, Ram, Prahalad, C.K. & Rangaswami, M.R. (2009): <https://hbr.org/2009/09/why-sustainability-is-now-the-key-driver-of-innovation>

¹⁹ Anthony, Andrew. (2019, March 26): <https://www.theguardian.com/books/2019/mar/26/winners-take-all-anand-giridharadas-review>

²⁰ Ignatius, Adi. (2012): <https://hbr.org/2012/06/captain-planet>

²¹ Ignatius, Adi. (2012): <https://hbr.org/2012/06/captain-planet>

²² Joshi, Sachin., Kumar, Nandini & Mitra, Ramanuj. (2018): https://sustainabledevelopment.in/uploads/pdf/1536209485CS659_CESD%20CE%20Guidebook_new.pdf

World Business Council for Sustainable Development (WBCSD) & Accenture Strategy (n.d.): https://docs.wbcd.org/2017/06/CEO_Guide_to_CE.pdf

²³ Goldenberg, Suzanne. (2014, September 13): <https://www.theguardian.com/environment/2014/sep/13/richard-branson-failed-climate-change-pledge>

formative innovation. Instead of looking for alternatives to flying and what makes people fly Branson focused on green fuel and technologies to remove CO₂ from the atmosphere, the ultimate end-of-pipe solution.²⁴

However, over the last two-three years a significant shift has taken place. When Laurence D. Fink of Blackrock, one of the most influential investors in the world, sent his annual letter to chief executives of the world's largest public companies in 2018 the message resulted in an intensive discussion. In his letter he said the following:²⁵

“Society is demanding that companies, both public and private, serve a social purpose. To prosper over time, every company must not only deliver financial performance, but also show how it makes a positive contribution to society.”

As the financial sector has been one of the last to acknowledge the need for fundamental change and most of them still resist any demands on companies outside profit this came as a shock for many.

After Fink's letter a wave of more mainstream stakeholders in business has begun to discuss what contributions they give to society. Sarah Gordon, the business editor at Financial Times, captured the spirit well in her farewell article:²⁶

“business needs to do more than change its culture. It must challenge itself on what its purpose really is, not just what its investors want. It must be prepared to tackle the great ills of our time, such as climate change or modern slavery. And it must be louder in explaining why it matters.”

The shift in the financial sector should not be exaggerated, still most financial stakeholders approach sustainability from a problem perspective where data related to risk is the focus. They look for the least bad in sectors and ask for incremental solutions, rather than ask how they can support those that can support a solution in a sustainable way. Even the small steps suggested by Fink's has also met with significant backlash from more mainstream economists.²⁷

It is obviously easier to celebrate fast food companies providing carbon information of their burgers and offsetting emissions from unsustainable and unhealthy food as being less bad than those not doing, than supporting those that can provide healthy and sustainable food for an equitable world with 10 billion people. In the same way it is easier to celebrate fast fashion companies that recycle their products, rather than ask who can provide us with sustain-

²⁴ Virgin Earth, website. (2019): <https://www.virginearth.com/>

²⁵ Fink, Larry. (2018): <https://www.blackrock.com/hk/en/insights/larry-fink-ceo-letter>

²⁶ Gordon, Sarah. (2019, March 8): <https://www.ft.com/content/c2102d6e-3ea9-11e9-9bee-efab61506f44>

²⁷ Kramer, Mark R. (2019, January 31): <https://hbr.org/2019/01/the-backlash-to-larry-finks-letter-shows-how-far-business-has-to-go-on-social-responsibility>

able clothing in an equitable world with 10 billion people, that empower us and can be used for decades due to timeless design and high quality.

In order to better understand the different roles of a company a taxonomy can be created. One taxonomy that captures many of the current tensions is the one developed by Thomas Dyllick and Katrin Muff, “From Business-as-Usual to True Business Sustainability”, where companies relation to sustainability is divided into three categories.²⁸ These are described below.

1.1. Sustainability 1.0: Cost Efficiency²⁹

Main driver: Saving money

Output: Profit

Thomas Dyllick and Katrin Muff refer to SAM Group and PricewaterhouseCoopers (2006) in their definition of corporate sustainability as a way to describe Sustainability 1.0:

Corporate sustainability is an approach to business that creates shareholder value by embracing opportunities and managing risks deriving from economic, environmental and social developments.

In other words, Sustainability 1.0 is when companies can identify certain measures that are profitable and make short-term economic sense without any significant efforts. Usually these measures are due to bad internal management when one part of the company is in charge of procurement (and only look at upfront costs) and another is in charge of the procurement (and there for responsible for the running costs). Typical examples of activities under Sustainability 1.0 includes cost-efficient reductions of excessive packaging, improvement wasteful processes and more energy efficient products.

Dyllick and Muff use incremental improvements in the food industry as an example for Sustainability 1.0 and note the following:³⁰

[Sustainability 1.0] means introducing sustainability into its governance structures by responding systematically to stakeholder concerns, not only by developing policies and codes covering major issues in sustainable sourcing, product development and safety, marketing and communication but also by creating organizational, managerial, and board structures for effective management, control, and auditing.

²⁸ Dyllick, Thomas & Muff, Katrin. (2016): https://docs.wixstatic.com/ugd/7d558e_cc3d0877ddc04558a4e00ccb2a342574.pdf

²⁹ The text below is a slightly edited version of the article “Clarifying the Meaning of Sustainable Business: Introducing a Typology From Business-as-Usual to True Business” by Dyllick, Thomas & Muff, Katrin. (2016): https://docs.wixstatic.com/ugd/7d558e_cc3d0877ddc04558a4e00ccb2a342574.pdf

³⁰ Dyllick, Thomas & Muff, Katrin. (2016), p. 164: https://docs.wixstatic.com/ugd/7d558e_cc3d0877ddc04558a4e00ccb2a342574.pdf

With regard to processes, procedures for energy and water efficiency, for greenhouse gas reduction, sustainable sourcing, manufacturing, and transport need to be implemented.

In particular, not only sustainable and fair sourcing has recently been a major concern, if you think of palm oil, soy, cocoa, coffee, tea, meat or fish but also procedures for verification and certification. And with regard to products, [Sustainability 1.0] means for the food industry to reduce their environmental footprint and improve their social value and nutritional quality (e.g., reduce sugar, salt, saturated fats, calories), to minimize waste and packaging, as well as to provide transparent and verified information to consumers.

The reason for the activities under Sustainability 1.0 start and ends with the short-term economic value for the company. Addressing sustainability might generate positive side-effects for some sustainability issues, but their main purpose is to reduce costs and business risks, to increase reputation and attractiveness for new or existing human talents, to respond to new customer demands and segments, and thereby increase profits, market positions, competitiveness, and shareholder value.

While some companies use sustainability 1.0 for marketing many companies only implement these measures for short-term economic gains and do not pretend to be more than this. E.g. when they are given information that LED lights are more cost efficient than CFL and incandescent light bulbs they change to more cost-efficient solutions, for pure economic reasons.

1.2. Sustainability 2.0: Green Markets³¹

Driver: Accountability and marketing

Output: Profit with minimum negative impact

Thomas Dyllick and Katrin Muff define Sustainability 2.0 as “a further step in introducing sustainability into business” which “acknowledges that sustainability is more than just recognizing the relevance and need to respond to social and environmental concerns, in addition to economic concerns.” They further write:³²

“[Sustainability 2.0] means broadening the stakeholder perspective and pursuing a triple bottom line approach. Value creation goes beyond shareholder value and includes social and environmental values. Companies create value not just as a side-effect of their business activities, but as the

³¹ The text below is a slightly edited version of the article “Clarifying the Meaning of Sustainable Business: Introducing a Typology From Business-as-Usual to True Business” by Dyllick, Thomas & Muff, Katrin. (2016): https://docs.wixstatic.com/ugd/7d558e_cc3d0877ddc04558a4e00ccb2a342574.pdf

³² Dyllick, Thomas & Muff, Katrin. (2016), p. 164: https://docs.wixstatic.com/ugd/7d558e_cc3d0877ddc04558a4e00ccb2a342574.pdf

result of deliberately defined goals and programs addressed at specific sustainability issues or stakeholders. These values are not only addressed through particular programs, but they are also measured and reported about.

This view of [Sustainability 2.0] is well captured by the definition used by the Network for Business Sustainability (2012): Business sustainability is often defined as managing the triple bottom line – a process by which firms manage their financial, social and environmental risks, obligations and opportunities. These three impacts are sometimes referred to as people, planet and profits. [Sustainability 2.0] is clearly more ambitious than [Sustainability 1.0] and represents a big step forward in making sustainability a respected and integrated business topic. It allows business to align the concerns it addresses with the values it seeks to create by relating economic, environmental, and social concerns to the triple bottom line values of sustainability.

When Dyllick and Muff use the food industry as an example and for Sustainability 2.0 they note the following:³³

Looking at [Sustainability 2.0] in the food industry means introducing sustainability into its governance structures. This requires that sustainability objectives are integrated into the planning and reporting cycles to define specific objectives for projects and brands, and ensuring that goals are achieved through adequate forms of incentives and accountability. Also, reporting about the achievements in a transparent and externally verified way is an important element. Processes and transparent procedures for reducing greenhouse gases, energy, water use, and waste from manufacturing, transportation, and offices need not only be implemented but also measured and reported on. Objectives and achievements with regard to sustainable sourcing must be measured and communicated.

In other words, [Sustainability 2.0] means not merely that the direct environmental footprint is minimized, but that a footprint is reduced over the whole product life-cycle and consumer use, to improve the social and nutritional quality, and to limit waste and packaging in an innovative and clearly defined and controlled way. Objectives and achievements, including information concerning sustainable consumption and improved health and welfare, are to be reported on. The underlying objective for [Sustainability 2.0] firms is to invent, produce, and report on measurable results within well-defined SD areas while doing this in an economically sound and profitable manner. The value proposition of business is broadened to include the three dimensions of the “triple bottom line” (people, planet, profit). However, the perspective applied is still “inside-out”.

³³ Dyllick, Thomas & Muff, Katrin. (2016), p. 164: https://docs.wixstatic.com/ugd/7d558e_cc3d0877ddc04558a4e00ccb2a342574.pdf

Hedberg, Annika., Šipka, Stefan & Bjerkem, Johan. (2019): <https://www.climate-kic.org/wp-content/uploads/2019/07/DRCE.pdf>

In many ways sustainability 2.0 might be the most challenging corporate strategy to deal with in relation to sustainability. It is driven by a “win-win-win” narrative, also called triple-bottom-line, where the idea is that profits are balanced with ecological and social goals. Companies embracing sustainability 2.0 often try to position themselves as sustainability leaders.

The conceptual idea to claim “balancing” profits and planet is however unfortunately rather counterproductive for the sustainable development when viewed from a company perspective. Such a perspective is conserving the idea that sustainability issues can only be costly and never an option or acknowledge that sustainability is actually a prerequisite for long-term business. The conflict is hidden in the question: Are you profitable due to or in spite of sustainability? To overcome the inherent mental conflicts of sustainability ambitions and profitability a decoupling between unsustainability and economy has to be demonstrated. There is a clear potential of decoupling within the framework of Circular Economy, but only if it complies with the true intentions that makes the society independent of linear solutions.³⁴

The fact that nature/ecology is what we all depend on, that the goals we have for society is why we have companies, and that profits are only a tool tend to get lost. Even more troubling are that many NGOs and government bodies now use the same sustainability 2.0 approach to guide policy development.³⁵

Today it is clear that many of those claiming to be sustainability leaders are communication and risk manager engaging in incremental improvement in unsustainable system. Some companies with extreme PR focus are even trying to position offsetting and similar non-core business measures that distract from real transformation as leadership, something that a new generation find dishonest.³⁶

Even the person behind the triple-bottom-line approach, John Elkington, has finally realized that sustainability 2.0 almost never deliver anything meaningful. He makes an interesting observation that accountants and reporting consultants have diluted the original idea, that he claims is “system change” resulting in “breakthrough change, disruption, asymmetric growth (with unsustainable sectors actively sidelined), and the scaling of next-generation market solutions”.³⁷

³⁴ This is decribed in "Cirkulär Kemi-Resan från kemipanik till Cirkulär Ekonomi" by Hedenmark, Magnus (2016) (In Swedish).

³⁵ If the focus on sustainability 2.0 among many NGOs and government bodies is due to lack of knowledge about companies, lack of understanding for system change, fear of asking uncomfortable questions, or something is an area for further research.

³⁶ Hedenqvist, Robin & Johansson, Hannah. (2018): <http://www.diva-portal.org/smash/get/diva2:1209268/FULLTEXT01.pdf>

Max Burgers, website. (2019): <https://www.maxburgers.com/Home/climate-positive/climate-positive/>

³⁷ Elkington, John. (2018): <https://hbr.org/2018/06/25-years-ago-i-coined-the-phrase-triple-bottom-line-heres-why-im-giving-up-on-it>

“Together with its subsequent variants, the [Triple-bottom-line] concept has been captured and diluted by accountants and reporting consultants. Thousands of [Triple-bottom-line] reports are now produced annually, though it is far from clear that the resulting data are being aggregated and analysed in ways that genuinely help decision-takers and policy-makers to track, understand, and manage the systemic effects of human activity.”

What Elkington does not address is how a focus on reducing the negative impacts, that is at the core of the triple bottom line will result in “breakthrough change, disruption, [...] and the scaling of next-generation market solutions”. Those with a focus on breakthrough change and disruption for global sustainability, rather than incremental improvement in existing systems, tend to ask for something more. This “something” is often what can be called a sustainability 3.0 approach.

1.3. Sustainability 3.0: Delivering on Sustainability

Driver: Purpose to make the world better

Output: Products and services making the world better with profit only as a tool

For sustainability 3.0 the focus shifts from the company to society. Instead of asking how the company can reduce the emissions from its current products, or respond to specific niche markets preferences for more sustainable products, the focus is on how the company can contribute to what is needed in society.

The focus is not how far companies can go within existing systems (sustainability 1.0), or what they can achieve with minor changes often based on branding strategies and short-term risk (sustainability 2.0), instead it is on what society actually needs. A sustainability 3.0 company is one that identifies what is needed in society, delivers on those needs, and does so in a sustainable way.

Dyllick and Muff define Sustainability 3.0 as follows:³⁸

[A] truly sustainable business shifts its perspective from seeking to minimize its negative impacts to understanding how it can create a significant positive impact in critical and relevant areas for society and the planet. A [Business Sustainability 3.0] firm looks first at the external environment within which it operates and then asks itself what it can do to help overcome critical challenges that demand the resources and competencies it

³⁸ Dyllick, Thomas & Muff, Katrin. (2016): https://docs.wixstatic.com/ugd/7d558e_cc3d0877ddc04558a4e00ccb2a342574.pdf

has at its disposal. As a result, a [Business Sustainability 3.0] firm translates sustainability challenges into business opportunities making “business sense” of societal and environmental issues.

They then go on and suggest a list of questions that we should expect Sustainability 3.0 companies to ask themselves:³⁹

1. Which of the burning environmental, societal, or economic issues could be resolved by dedicating our wealth of resources, competencies, talents, and experiences?
2. What are the benefits and contributions of our products and services to society and the environment?
3. How can we transform our operations to provide solutions (products or services) in a direct and measurable way to the burning issues in nature and society?
4. How can we open up and develop our governance structures to respond more effectively to society’s concerns?
5. What can we do individually? And where do we need to engage in sector-wide or cross-sectorial strategies?
6. Where do we need to engage in activities to change the rules of the game to bring together the divergent demands of the current economic system and the demands of [sustainable development]?

The main difference between Sustainability 1.0-2.0 and 3.0 is that Sustainability 3.0 companies shifts the perspective from seeking to minimize its negative impacts to understanding how companies can create a significant positive impact in critical and relevant areas for society and the planet.

Sustainability 3.0 therefore represents a fundamentally different strategic approach that require CEOs and boards to be included. Instead of employing communicators or supply-chain managers as head of sustainability that address the operational risks, they should ask what the company can actually deliver in society and build teams, KPIs and CRM systems around this. Instead of taking what the company does for granted and minimize the negative impacts, the company identifies how it can use its resources to best contribute to what is needed in society.

As any sound company they should start by looking at the market, what is needed, but add the sustainability filter to this assessment. Further, it should not take the current system for granted. If it is not possible to deliver sustainability within the current system, the rules need to change. The company should start out by reviewing pressing sustainability challenges that society faces, and then challenge itself to develop new strategies and business models that deliver solutions for these challenges. The company should also communicate what changes are needed to deliver on sustainability.

³⁹ Dylllick, Thomas & Muff, Katrin. (2016): https://docs.wixstatic.com/ugd/7d558e_cc3d0877ddc04558a4e00ccb2a342574.pdf

The potential for contributing positively will vary largely between companies, their resources, strategies and purposes, and it will vary between different industry sectors and societal contexts.

One of the more controversial areas for Sustainability 3.0 relates to how companies should engage in the structural changes needed. For example, how much they should engage in lobbying. Dyllick and Muff support an active role and write:⁴⁰

In order to create new space for economic and sustainable solutions and to scale-up the impacts, truly sustainable businesses will also have to engage in changing the rules of the game. After all, big sustainability problems like climate change, availability of water, and loss of biodiversity cannot be solved by business alone. Also, businesses are often punished by financial and consumer markets when they engage in serious sustainability strategies, as many soft drink companies are experiencing when looking for alternatives to address the causes of obesity. Such companies will not be able to address the real sustainability issues they are confronted with as long as the rules of the game are not changed.

The fact that the rules of the game needs to change is not controversial, but the role of companies in this process is not uncontroversial. While support for stronger regulations from companies makes it easier for policy makers and media to discuss such issues it begs the question of accountability and democracy. The challenge is similar to that of philanthropy where rich individuals can shape policy to their liking in ways that is not obvious in line with the ideas of a functioning democracy.

When Dyllick and Muff use the food industry as an example for Sustainability 3.0, they note the following:⁴¹

Food companies will need to evaluate sustainability challenges and define the relevant issues for them, taking into consideration their exposure as well as their competencies to solve them. The choice will be among issues like alleviating poverty, access to clean and affordable water, providing healthy and affordable nutrition, or supporting smallholder farmers and distributors in developing countries. In developed countries, the issues are more oriented toward fighting overconsumption and obesity, providing healthy products for different ages, contributing to public health and healthy life-styles, sustainable agriculture, production and consumption, or fighting food waste.

⁴⁰ Dyllick, Thomas & Muff, Katrin. (2016), p. 167: https://docs.wixstatic.com/ugd/7d558e_cc3d0877ddc04558a4e00ccb2a342574.pdf

⁴¹ Dyllick, Thomas & Muff, Katrin. (2016), p. 167: https://docs.wixstatic.com/ugd/7d558e_cc3d0877ddc04558a4e00ccb2a342574.pdf

Products and services not only include healthy and balanced products but also new forms of health-related information and education for consumers, provided collaboratively with scientific and public organizations, and they may also include restraints from misleading and aggressive marketing.

In many ways sustainability 3.0 companies represent a return to the original reason why companies were created. Instead of approaching companies as having an intrinsic value and focus on win-win-win, companies are approached as tools and the only thing important is if society is improving in a sustainable way. This is not about if companies are good or bad, it is if they are delivering on what is needed in a sustainable way or not.

2. Circular Economy

Let's now take a closer look on the concept of circular economy. As circular economy is a vague term with many different meanings, we can begin by exploring different definitions. One of the most well-known stakeholders working with circular economy, the Ellen MacArthur Foundation, define circular economy in the following way:⁴²

Looking beyond the current take-make-waste extractive industrial model, a circular economy aims to redefine growth, focusing on positive society-wide benefits. It entails gradually decoupling economic activity from the consumption of finite resources, and designing waste out of the system. Underpinned by a transition to renewable energy sources, the circular model builds economic, natural, and social capital. It is based on three principles:

1. Design out waste and pollution
2. Keep products and materials in use
3. Regenerate natural systems

It is not clear how the grand and transformative aims in the beginning about redefining growth and positive society-wide positive effects relate to the simple and incremental principles that the Ellen MacArthur Foundation say that it is based on. The incremental principles are also similar to the definition used by the European Commission. A definition that was introduced in “Closing the loop – An EU action plan for the Circular Economy” in 2015.⁴³

The value of products and materials is maintained for as long as possible and waste and resource use are minimised.⁴⁴

The Ellen MacArthur Foundation however clearly wants circular economy to be about something more, a transition towards a sustainable society more broadly:⁴⁵

Transitioning to a circular economy does not only amount to adjustments aimed at reducing the negative impacts of the linear economy. Rather, it represents a systemic shift that builds long-term resilience, generates business and economic opportunities, and provides environmental and societal benefits.

⁴² Ellen MacArthur Foundation. (2019): <https://www.ellenmacarthurfoundation.org/circular-economy/concept>

⁴³ European Commission. (2015): <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52015DC0614&from=EN>

⁴⁴ European Commission. (2015): <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52015DC0614&from=EN>

⁴⁵ Ellen MacArthur Foundation. (2019): <https://www.ellenmacarthurfoundation.org/circular-economy/concept>

In practice it is however more difficult to identify any specific differences. As the Scientific and Technical Advisory Panel (STAP) to the Global Environment Facility (GEF) noticed, the Ellen MacArthur Foundation summarised the goals for a circular economy in the plastics sector as follows: “improve the economic viability of recycling and reuse of plastics; halt the leakage of plastics into the environment, especially waterways and oceans; and decouple plastics production from fossil-fuel feedstocks, while embracing renewable feedstocks”.⁴⁶ In short it is about optimising existing systems, making sure that plastic is renewable and recycled. This does not have to be bad, but often is, as those that use it tend to have fundamentally unsustainable business models that is pushing unnecessary goods that most customer does not see as important upon reflection, and sometimes even an unhealthy overconsumption.

It is this kind of oscillation between a focus on transformative solutions and global sustainability on one side and incremental improvement in existing systems and PR on the other side, that the circular economy concept has made possible.

The dominating narrow approach starts from the sector and companies, rather than nature and sustainability. Many existing initiatives invites the companies that are part of the problem and then ask how far they can go, assuming only sustainability 1.0 and 2.0 approaches. In order to find transformative solutions and encourage companies to become solution providers the needs of society should be in focus and companies encouraged to find sustainable solutions to these needs.

However, what kind of solutions that are needed depend on how the problem is defined.

One of the most important, but often ignored aspects of circular economy is to understand the role of different materials and the kind of systems needed to ensure global sustainability.

If you have services provided in society that can be built on modules, repaired and reused there is a possibility to extend the lifetime of the products. But if they are going to be recycled, we must ask us what material we are dealing with. Metals can, for all practical reasons, be recycled forever within the technical cycle. Easily biodegradable renewables as food residues and many natural fibers, are to be processed in the biological cycle mainly by composting.

When it comes to plastic, paper and textiles it is however not that simple. Petroleum based plastics can only be mechanically recycled for a limited number of times and chemical recycling is very energy demanding. Paper is a renewable material that can be recycled 4-7 times but the virgin pulp is processed in a very resource demanding way.

Textiles may theoretically be 100% circulated with appropriate selection of synthetic or natural fibers combined with non-hazardous chemicals; but

⁴⁶ Barra, Ricardo & Leonard, Sunday A. (2018): <https://www.thegef.org/sites/default/files/publications/PLASTICS%20for%20posting.pdf>

has still big sustainability challenges in the product life cycles as washing and big turnover volumes. From a circular perspective the use of these materials should be strictly limited to its carrying capacity with respect to biodiversity, energy demand etc, especially if they are used for a short time, such a beverage container or in fast fashion.

Exactly how many times a material can be recycled and into what is a very complicated issue and depend on a multitude of factors beyond the general category listed below including:⁴⁷

1. The composition of the material (e.g. there are very many different plastics and textiles).
2. How they are combined (most products have very many different materials and still very few are designed for optimal recycling. There are also other factors related to how they are combined that affect how they can be upgraded, decommissioned and turned into their original material).
3. If they are contaminated (depending on how a product has been used it can contain different materials that needs to be separated, from food/liquid to toxic chemicals).

Material	Number of times a material can be recycled without losing value
Metals (e.g. Aluminium and Steel)	∞
Glass	∞
Paper	4-7
Plastic	2-9
Textiles	0-3

For plastic, paper and textiles it is therefore especially important that a circular focus starts with focus on what is needed in society. Is it possible to dematerialize or change the business model fundamentally? Too often the focus is on making current business practice incrementally better without asking what new transformative solutions exist.

The most important question to start the discussion about a circular economy is to ask what kind of society we want. Are the current amounts of soft drinks and fast fashion compatible with the sustainable future we want? Do we want healthy nutritious and sustainably produced drinks that can be easily distributed in a distribution system that does not depend on single use packaging?⁴⁸

In the same way do we want a fashion industry built around a mass-marketing machine that creates insecurity among customers in order to

⁴⁷ Howard, Brian C. (2018, October 31): <https://www.nationalgeographic.com/environment/2018/10/5-recycling-myths-busted-plastic/>

Wikipedia, website. (2019): https://en.wikipedia.org/wiki/Recycling_by_material

Design for Longevity, website. (2019?): <https://designforlongevity.com/articles/close-the-loop>

⁴⁸ Bluewater. (2019): <https://www.bluewatergroup.com/about/our-vision/>

encourage a young generation to focus on how they look rather than on what they do, all just to make them buy fast fashion.⁴⁹ Perhaps we want companies that help us become more confident and define our identity based on what we do, maybe even helping us reconnecting with nature and design the clothing to last and not be sensitive to changes in fashion?⁵⁰

2.1. Solution criteria

Based on the interviews conducted for this paper four areas are important to clarify if we are to understand what kind of solution that is needed:

1. Impact: What is the problem the solution is trying to address?
2. Probability: What is the probability of the problem and what is the probability the solution will solve the problem?
3. Borders: What are the geographical and legal borders for a problem and the solution?
4. Time-horizon: What are the temporal boundaries for the problem and for the solution?

In addition to these four criteria the uncertainty regarding all of the above also must be considered.

1. Impact

It might sound trivial, but what the relevant impacts are that should be reduced are often unclear or even overlooked. When a problem is defined it is usually vague, such as “harmful” or “dangerous” there is a tendency among many organizations and authorities to try to establish the problem in scientific terms; to find a specific level or amount that is a “problem”.

The challenge is that it’s not possible to base a problem on science, since the definition of problem is something normative and can only be a value judgment. Once we have agreed on the ethical judgment, we can use science to set specific targets. For example, if we have agreed on how much suffering and destruction that is acceptable, we can set a target for emission reductions. But what we deem to be a problem and a solution can never be reduced to a simply a scientific fact. This is captured by Hume Law that states that an “ought” can not be derived from an “is”.⁵¹

The problem we have in relation to plastic is that many different groups have very different arguments for why plastic should be reduced or even eliminated. For plastic the impact can range from addressing local esthetic questions, via microplastics in oceans that threatens specific species, to reduced

⁴⁹ Kong, Lee Lian. (2018, June 28): <https://www.scmp.com/lifestyle/fashion-beauty/article/2152687/why-fast-fashion-brands-hm-are-losing-millennial-customers>

⁵⁰ Houdini, website. (2017): <https://houdinisportswear.com/en-se/explore/houdini-manifesto>

⁵¹ The Stanford Encyclopedia of Philosophy. (2004, October 29, substantive revision 2018, August 20): <https://plato.stanford.edu/entries/hume-moral/>

overconsumption and linear business models that currently is contributing to an accelerating ecological collapse that could be an existential threat to human civilization.

Without a clear understanding why plastic is a problem, and what values it provides it is impossible to develop clear and coherent strategies. The fact that multiple problems and multiple benefits exists allow different groups to pick and choose what problems they want to solve, and the easiest tend to be waste as the only thing needed then is to make sure that the waste is not seen by those who see it as a problem.

2. Probability

The probability of both the problem and the solution must be understood as both can vary between close to zero to close to 100%. As risk is the negative impact times the probability both are factors important when establishing actions to solve a problem as it will determine how serious it is.

Less common, but equally important to realize is that an opportunity can be seen as the positive impact times the probability of success. A challenge is that incremental improvements in existing systems are easier to estimate and calculate, as more data tend to be available and the calculations are simpler due to less factors to include. The probability of success is usually high for incremental improvements in existing systems. Transformative system changes are harder to estimate and calculate due to lack of data, but even more because the calculations are highly complex, and often a lot of data is not even available.

A dilemma is that we often seem to be torn between measures that do not solve the problem, but that are easy to implement successfully and measure on one hand, and measures with a possibility to solve the problem, but that are very hard to successfully implement and measure on the other hand. Too often focus among those working with sustainability challenges is on successful outcome, without asking how important the actual result is.

3. Borders

Increasingly sustainability challenges are approached as global challenges without geographical borders, but that is still the exception from the rule. With regards to waste the problem is often considered “solved” when it is no longer within national, or even local, borders.

There is a growing tension between those working with national, regional or local goals (such as cities) and those with global goals. With a young generation growing up viewing themselves increasingly as global citizens and with a focus on ethics and science rather than legal responsibility global goals are likely to become more important. However, it is important to note that the approach to many global challenges differ significantly between and within countries.⁵²

⁵² Broadbent, Emma., Gougoulis, John., Lui, Nicole., Pota, Vikas & Simons, Jonathan. (2017): <https://www.varkeyfoundation.org/media/4487/global-young-people-report-single-pages-new.pdf>

4. Time horizon

Time horizons are important to clarify. Different problems affect future generations in very different ways. How many generations into the future do we include in our assessment, or is it only people living now that we care about? If future impacts are discounted, what discount rate is used? Also, for solutions time horizons are important to clarify. By when is a specific solution expected to be ready, and what other solutions are expected to be ready around the same time?

2.2. Overton Windows for Solutions

One of the least discussed, but most important, aspects of the different environmental challenges is the question of what solutions that are seen as acceptable and what solutions are seen as unthinkable and why.

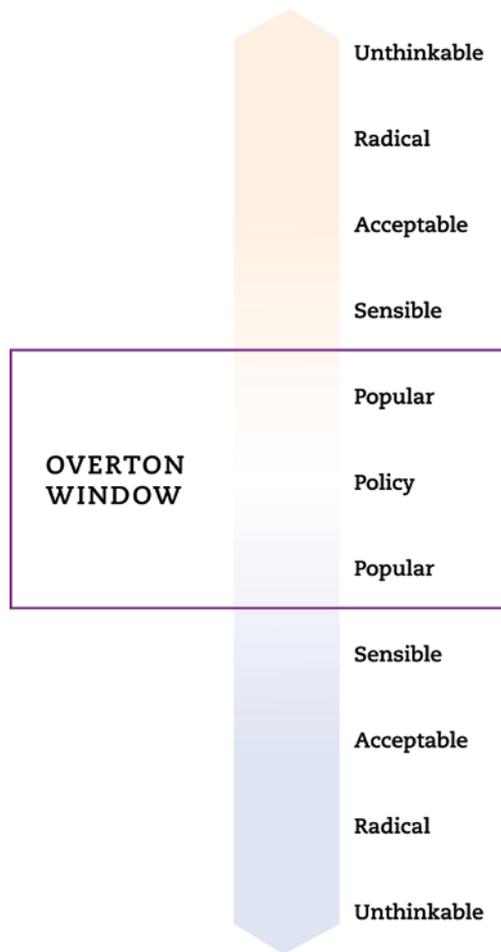
The questions of why one solution is seen as unthinkable and another as uncontroversial depend on contexts, something that is increasingly important to understand in a time of social media that has resulted in many subcultures. For major global challenges that require significant structural changes that only governments and large companies can deliver, it is important to understand how solutions can move into policy.

In social sciences the term “Overton Window”, developed by Joseph P. Overton, describes the range of ideas tolerated in public discourse.⁵³ The exact position of the Overton window is less important than the understating that it moves and can be moved. In an increasingly complex and fragmented world the idea of multiple Overton windows becomes important to understand.

A simple economic perspective would assume that it is only the price that defines how unthinkable and how sensible a solution is. In reality there are many different aspects, especially ideological, that determine what solution that falls into what categories. In the old political world, a solution would be defined on a right/left spectrum. For example, if there was a “right” leaning government market based, solutions are seen as more attractive. If there was a “left” leaning government a strong government that would set targets and ensure outcomes would be seen as the preferred option.

These old right/left spectra still have some relevance, but increasingly less so as there are more fundamental differences that relate to questions about risk, centralized/decentralized solutions, balance between technology and behavioral change, and how much we should protect the old industries and how much we should support smaller companies with solutions. The old overriding goal of economic growth that was shared by left and right is also no longer as relevant. The new political landscape must answer new questions and frame the choices in new ways.

⁵³ Wikipedia, website. (2019): https://en.wikipedia.org/wiki/Overton_window



Climate change and the solutions suggested to address the challenge provides an interesting case study for Overton windows. A simplified scale can be established that cover three key aspects that have been important over the almost three decades since climate change become institutional as a key global challenge through the UNFCCC in 1992.

1. Degree of system change
2. The number of solutions considered
3. Importance of behavioral change



From 1992 until the early 2000's the degree of system change that was seen as possible by all major stakeholders working with climate change from the environmental NGOs to the fossil fuel industry, was assumed to be close to zero.

The number of proposed and expected solutions during the same time period was also small, with CCS and geoengineering being pushed by a fossil fuel industry that saw themselves attached to fossil fuels forever. These fossil fuel companies wanted solutions that would not require them to make any significant changes to their business models) and renewable energy, initially biofuel and hydropower and increasingly wind and solar from the environmental NGOs.

When it comes to behavioral change the mainstream environmental NGOs together with the fossil fuel industry did not expect any significant changes. Those proposed behavioral changes suggested radical reductions of activities related to the release of carbon, but even if these were significant changes, there were more reductions in existing systems than smart system changes.

During the last ten years the Overton windows have moved and changed nature dramatically. Based on the desk research and interviews three key factors has been identified that are both moving the window as well as creating a situation where we must acknowledge multiple windows.

1. The perceived urgency of the problem

Over the last few years the perceived threats have changed when it comes to environmental and other sustainability challenges. The most significant shift is perhaps for climate change, but also ecosystem collapse.⁵⁴

Studies that focus on the perceived risk level, such as the World Economic Forum's annual global risk report now have multiple environmental threats among the top-ten global risks.⁵⁵ Threats usually result in increased interest in all possible solutions, with the most significant increase at the ends of the spectra, i.e. both increased interest in geoengineering and in new transformative smart system solutions.

It is reasonable to assume that a threat is perceived to increase will make the Overton windows larger and if there are significant shocks to the system earlier solutions outside any window could benefit as they would be perceived as new and innovative in response to the threat.

2. The perceived availability of solutions

A more complex area is what solutions that are seen as available. Back in 1992 the companies with the largest resources (for everything from R&D to lobbying) were the fossil fuel-based companies. The solutions that require them to do the least, and also let them be in control of the solution discussion is carbon capture in different shapes and forms. Geoengineering is attractive to

⁵⁴ United Nations. (2018, May 15): <https://news.un.org/en/story/2018/05/1009782>

⁵⁵ World Economic Forum. (2019): <https://www.weforum.org/reports/the-global-risks-report-2019>

all companies that do not want to change, so basically to all large companies and especially those with significant carbon emissions, i.e. almost all the heavy industries.⁵⁶

It is worth noticing that the 4th industrial revolution, driven in particular by digitalization, has disrupted many sectors that made transformative change the new normal. Companies now expect significant change over the coming years and the experience from disruptive new business models based on sharing, dematerialization and with smart decentralized solutions are much more acceptable.

The fact that needs can be met with fundamentally new solutions is slowly beginning to become the new normal. Still many old institutions are approaching the climate challenge as a question of reducing emission from the polluting industries, rather than a question of how new smart solutions can be provided, but it is changing.

The challenge for the smart decentralized solutions is that they are many and delivered by even more actors. Most traditional structures, from mainstream media, via the large financial companies, to old political parties, know how to discuss, support, finance and analyze large scale individual solutions (such as CCS and large-scale production of hydrogen) rather than a multitude of interactive decentralized solutions that deliver transformative system change. At the other hand new social media, new financial instruments and new political movements tend to focus more on the new decentralized structures.

This tension between the traditional and new is a challenge as the two groups tend to ignore and even despise each other. This links to the last aspect; support among key stakeholders

3. The perceived support among stakeholders

The question about support from stakeholders is perhaps the most complex as there is a two-step question. First what stakeholders that are perceived as relevant, and second what solutions they support. The rapid change over the last decades have changed the dynamics. Below is comparison of the largest companies in the US 1992 and 2018:

1992

- 14 of the 20 largest companies, 70%, on Fortune 500 focused almost exclusively on delivering fossil-based products.
- At the time of the Kyoto protocol many of the world's largest companies, nine of 20, were part of the Global Climate Coalition (GCC) an organization that questioned climate change and the need to reduce emissions.

⁵⁶ Kenton, Will. (2018, April 21): https://www.investopedia.com/terms/h/heavy_industry.asp

2018

- 2 of the 20 largest companies, 10%, on Fortune 500 focus almost exclusively on delivering fossil-based products.
- 0 companies are publicly challenging climate science
- 5 of 20 companies actively pursue opportunities to deliver smart low-carbon solutions (green highlight).
- An additional five tech, retail and financial companies on the list could easily become important solution providers if the leadership in those companies chose to.

In addition to a new generation of companies, social media has generated a new generation of groups influencing the agenda. Understanding what groups that are trusted for decisions are therefore very important.

3. The plastic challenge⁵⁷

The first sentences of the report “Plastics and the Circular Economy” by GEF reads as follow:

“The production of plastics increased by more than twenty-fold between 1964 and 2015, with an annual output of 322 million metric tonnes (Mt), and is expected to double by 2035, and almost quadruple by 2050”.⁵⁸

While plastics has contributed to economic development in the path it has not been without a significant price. Even more troubling is its contribution to current production and use pattern, based on a linear model of ‘take, make, use, and dispose’. The current wasteful and linear economy is a primary driver of natural resource depletion, waste, environmental degradation, climate change, and has adverse human health effects.

- 8,300 million tonnes of virgin plastics have been produced
- Half of this material was made in just the past 13 years
- About 30% of the historic production remains in use today
- Of the discarded plastic, roughly 9% has been recycled
- Some 12% has been incinerated, but 79% has gone to landfill
- Shortest-use items are packaging, typically less than a year
- Longest-use products are found in construction and machinery
- Current trends point to 12 billion tonnes of waste by 2050
- Recycling rates in 2014: Europe (30%), China (25%), US (9%)

From the paper “Production, use, and fate of all plastics ever made”, by Roland Geyer, Jenna R. Jambeck and Kara Lavender Law. In *Science Advances* 19 Jul 2017: Vol. 3, no. 7 <http://advances.sciencemag.org/content/3/7/e1700782>

Plastic is an interesting challenge as it seldom has a value in itself, but usually as a barrier/production of some goods, or as parts of a larger product. The plastic challenge is therefore very much linked to how society use the products delivered with the help of plastic.

To make plastic sustainable is therefore not only about the plastic material and how it is used, but even more about what kind of production and consumption patterns that plastic supports.

The crucial question is to point out which actor that should be responsible for making the plastics circular? Is it really up to the society and waste management facilities to take care of all kind of plastics that the chemical industry are distributing to the society or should we demand a producers responsibility to only deliver what can be managed in a circular society?

⁵⁷ BBC News. (2017, December 10): <https://www.bbc.com/news/science-environment-42264788>

⁵⁸ Barra, Ricardo & Leonard, Sunday A. (2018): <https://www.thegef.org/sites/default/files/publications/PLASTICS%20for%20posting.pdf>

There are thousands of different plastics on the market that differs radically in the ability of being properly recycled but not downcycled. Plastics as LDPE, HDPE, PA, and PET belongs to the group of polymers that are best suited for proper recycling, while PS, PVC, PTFE and PC are associated to the class of high-priority substances, Substances of Very High Concern, that threatens the public health; i.e endocrine disrupters, dioxines, carcinogenics, etc.⁵⁹

There is no coincident that plastic has become a symbol for our linear, wasteful and unhealthy society. In little more than a century, plastic has gone from being hailed as a scientific wonder to being reviled as an environmental scourge.

It was in 1907 that the first modern plastic, bakelite, was invented. This invention pointed the way to a whole family of products based on synthetic polymers – that is, compounds of large molecules made up of simple repeated units.⁶⁰

In the late 1950s and early 1960s, improvements in manufacturing processes brought the cost of making plastics down dramatically, paving the way for cheap mass production.

Zooming out and looking at plastic from a broader perspective it is clear that has contributed to our current society more ways than we usually think of. Or as a recent BBC article noted: “It’s not too much of a stretch to say that plastic made the modern world possible.”⁶¹

Many things that we take for granted today depend on it. The following examples are from a BBC article:⁶²

Milk, for instance, no longer has to be delivered in glass bottles, making it safer and less cumbersome to transport. Plastic has also allowed supermarkets to offer a wider range of fresher produce in a variety of portion sizes.

Grapes sold in sealed trays rather than loose bunches have reduced waste in stores by more than 20%, retail analysts say. Consumers are advised by the Food Standards Agency to put raw chicken in a plastic bag to avoid the risk of food poisoning. Modern medicine has also greatly benefited from the disposable plastic syringe, invented in 1955.

But it is not always easy to know who to trust. The numbers above from a BBC article⁶³, are mainly taken from the British Plastics Federation that is known for its resistance to legislations that limit the use of plastic.⁶⁴

⁵⁹ This is described in "Cirkulär Kemi-Resan från kemipanik till Cirkulär Ekonomi" by Hedenmark, Magnus (2016) (In Swedish).

⁶⁰ Wikipedia, website. (2019): <https://en.wikipedia.org/wiki/Bakelite>

⁶¹ Plummer, Robert. (2018, January 11): <https://www.bbc.com/news/business-42646025>

⁶² Plummer, Robert. (2018, January 11): <https://www.bbc.com/news/business-42646025>

⁶³ Plummer, Robert. (2018, January 11): <https://www.bbc.com/news/business-42646025>

⁶⁴ BPF. (2019): <https://www.bpf.co.uk/packaging/environment.aspx>

One of the great advantages, and disadvantages, of many types of plastic is that they're designed to last – for a very long time. And nearly all the plastic ever created still exists in some form today.

In July 2017 a paper published in the journal *Science Advances* by industrial ecologist Dr Roland Geyer, from the University of California in Santa Barbara, and colleagues, calculated the total volume of all plastic ever produced at 8.3bn tonnes. Of this, some 6.3bn tonnes is now waste – and 79% of that is in landfill or the natural environment.⁶⁵

This vast amount of waste has been driven by modern life, where plastic is used for many throwaways or “single use” items, from drinks bottles and nappies to cutlery and cotton buds.

Drinks bottles are one of the most common types of plastic waste. Approximately 480 billion plastic bottles were sold globally in 2016 – a million bottles per minute. Of these, 110 billion were made by one single company; Coca Cola.⁶⁶

The “single use” items are visible and has become a symbol of the plastic challenge and that is probably why the European Commission EU Strategy on Plastics focuses strongly on these items.⁶⁷ The current EU strategy focus is probably not best described as a strategy for plastic, but a strategy for plastic waste with focus on end-of-pipe strategies and incremental improvements in existing systems with the following goals:

- all plastic packaging on the EU market will be recyclable by 2030,
- the consumption of single-use plastics will be reduced and
- the intentional use of microplastics will be restricted.

It is interesting, and a bit surprising, to read the first three paragraphs of the European Strategy for Plastics in a Circular Economy.⁶⁸

Plastic is an important and ubiquitous material in our economy and daily lives. It has multiple functions that help tackle a number of the challenges facing our society. Light and innovative materials in cars or planes save fuel and cut CO2 emissions. High-performance insulation materials help us save on energy bills. In packaging, plastics help ensure food safety and reduce food waste. Combined with 3D printing, bio-compatible plastic materials can save human lives by enabling medical innovation.

⁶⁵ Geyer, Roland, Jambeck, Jenna R. & Law, Kara Lavender. (2017): <http://advances.sciencemag.org/content/3/7/e1700782>

⁶⁶ Laville, Sandra & Taylor, Matthew. (2017, June 28): <https://www.theguardian.com/environment/2017/jun/28/a-million-a-minute-worlds-plastic-bottle-binge-as-dangerous-as-climate-change>

⁶⁷ European Commission. (2018, November 20): https://ec.europa.eu/commission/news/eu-plastics-strategy-2018-nov-20_en

⁶⁸ European Commission. (2018): <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52018DC0028&from=EN>

However, too often the way plastics are currently produced, used and discarded fails to capture the economic benefits of a more 'circular' approach and harms the environment. There is an urgent need to tackle the environmental problems that today cast a long shadow over the production, use and consumption of plastics. The million tonnes of plastic litter that end up in the oceans every year are one of their most visible and alarming signs of these problems, causing growing public concern.

Rethinking and improving the functioning of such a complex value chain requires efforts and greater cooperation by all its key players, from plastics producers to recyclers, retailers and consumers. It also calls for innovation and a shared vision to drive investment in the right direction. The plastics industry is very important to the European economy, and increasing its sustainability can bring new opportunities for innovation, competitiveness and job creation, in line with the objectives pursued by the renewed EU Industrial Policy Strategy.

Only positive contributions to society are mentioned when the enabling effects in plastic are described, not any of the negative contributions (the first paragraph). In the second paragraph the plastic problem is reduced to the direct problems, with a strong emphasis on pollution. The third puts the plastic industry in the center, rather than the needs in society.

A challenge with action and responsibility related to plastic is that plastic is almost everywhere, but seldom the most significant challenge for companies. The exception is the plastic industry and perhaps the fast-food industry. This diffusion of responsibility might be the reason why plastic companies and fast food producers, especially soft drink producers, are spending resources on influencing policy and PR campaigns. Plastic is often not seen as a problem in itself, but rather as part of another problem where multiple challenges are included such as:⁶⁹

- Landfill
- Use of non-renewable resources
- Overconsumption

A solution to the “plastic challenge” can therefore vary significantly depending on what of the four aspects that are included:

1. Circularity (Life-cycle focus on plastic): Waste
2. Material (Product focus): Non-renewable/toxic material
3. Service delivery (Life-cycle focus on the service delivered):
Linear business models
4. Societal structure: Consumerism/overconsumption

These four areas are discussed below.

⁶⁹ The Nature Conservancy. (2017, January 31): <https://www.nature.org/en-us/what-we-do/our-insights/perspectives/the-biggest-environmental-challenges-of-2017/>
Marks, Joshua. (2018, April 1): <https://inhabitat.com/top-6-environmental-issues-for-earth-day-and-what-you-can-do-to-solve-them/>

3.1. Direct Environmental Challenges

One of the challenges with plastic and sustainability is the complexity. The challenges exist on multiple levels, and the alternatives are seldom without problems. Two of the main challenges due to the direct use of plastic are waste and use of non-renewable resources.

3.1.1. Circularity: Waste

The most discussed aspect of plastic today is waste, both traditional plastics and micro plastics. Some 18 billion pounds of plastic waste flows into the oceans every year from coastal regions.⁷⁰ The response to this is often either ban of specific products or improved recycling.

Because plastic wasn't invented until the late 19th century, and production really only took off around 1950, we have a mere 9.2 billion tons of plastic to deal with. Of that, more than 6.9 billion tons have become waste. And of that waste, a staggering 6.3 billion tons never made it to a recycling bin – a figure that stunned the scientists who crunched the numbers in 2017.

No one knows how much unrecycled plastic waste ends up in the ocean, Earth's last sink. In 2015, Jenna Jambeck, a University of Georgia engineering professor, provided a rough estimate: between 5.3 million and 14 million tons each year, just from coastal regions. Most of it isn't thrown off ships, she and her colleagues say, but is dumped carelessly on land or in rivers, mostly in Asia. It's then blown or washed into the sea. Imagine five plastic grocery bags stuffed with plastic trash, Jambeck says, sitting on every foot of coastline around the world – that would correspond to about 8.8 million tons, her middle-of-the-road estimate of what the ocean gets from us annually.

It's unclear how long it will take for different plastics to completely biodegrade as it depends on the chemical composition of the plastic and the environmental conditions (e.g. temperature, UV-radiation, available oxygen, humidity, microorganisms etc.).⁷¹ Estimates range from 450 years to never.

3.1.2. Material: Non-renewable/toxic material

Plastic is currently also a significant user of non-renewable resources. Petrochemicals set to be the largest driver of world oil demand, latest IEA analysis finds.⁷²

Petrochemicals – components derived from oil and gas that are used in all sorts of daily products such as plastics, fertilizers, packaging, clothing, digital devices, medical equipment, detergents and tires – are becoming the largest drivers of global oil demand, in front of cars, planes and trucks.⁷³

⁷⁰ Parker, Laura. (2018, December 20): <https://news.nationalgeographic.com/2018/05/plastics-facts-infographics-ocean-pollution/>

⁷¹ European Commission. (2018): <https://ec.europa.eu/environment/circular-economy/pdf/oxo-plastics.pdf>

⁷² International Energy Agency (IEA). (2018, October 5): <https://www.iea.org/newsroom/news/2018/october/petrochemicals-set-to-be-the-largest-driver-of-world-oil-demand-latest-iea-analy.html>

⁷³ International Energy Agency (IEA). (2018, October 5): <https://www.iea.org/newsroom/news/2018/october/petrochemicals-set-to-be-the-largest-driver-of-world-oil-demand-latest-iea-analy.html>

Petrochemicals are set to account for more than a third of the growth in world oil demand to 2030, and nearly half the growth to 2050, adding nearly 7 million barrels of oil a day by then. They are also poised to consume an additional 56 billion cubic metres (bcm) of natural gas by 2030, and 83 bcm by 2050.⁷⁴

Plastic production uses up to 6% of global oil production, and this is expected to increase to 20% by 2050, when plastic-related greenhouse gas emissions may represent 15% of the global annual carbon budget.⁷⁵

The Future of Petrochemicals is part of a new IEA series shining a light on “blind spots” of the global energy system – issues that are critical to the evolution of the energy sector but that receive less attention than they deserve. The report is among the most comprehensive reviews of the global petrochemicals sector, and follows other reports in the series, including the impact of air conditioners on electricity demand, the impact of trucking on oil demand, or the role of modern bioenergy in the renewables sector.

Petrochemicals are particularly important given how prevalent they are in everyday products. They are also required to manufacture many parts of the modern energy system, including solar panels, wind turbines, batteries, thermal insulation and electric vehicles.

“Our economies are heavily dependent on petrochemicals, but the sector receives far less attention than it deserves,” said Dr Fatih Birol, the IEA’s Executive Director. “Petrochemicals are one of the key blind spots in the global energy debate, especially given the influence they will exert on future energy trends. In fact, our analysis shows they will have a greater influence on the future of oil demand than cars, trucks and aviation.”

Demand for plastics – the key driver for petrochemicals from an energy perspective – has outpaced all other bulk materials (such as steel, aluminum, or cement), nearly doubling since 2000. Advanced economies currently use up to 20 times more plastic and up to 10 times more fertiliser than developing economies on a per capita basis, underscoring the huge potential for global growth.

The dynamism of the petrochemical industry is also driving new trends around the world. After decades of stagnation and decline, the United States has re-emerged as a low-cost location for chemicals production thanks to the shale gas revolution, and is now home to around 40% of the global ethane-based petrochemical production capacity. Meanwhile, the Middle East remains the lowest-cost centre for many key petrochemicals, with a host of new projects announced across the region.

Petrochemical products provide substantial benefits to society, including a growing number of applications in various cutting-edge, clean technologies

⁷⁴ Barra, Ricardo & Leonard, Sunday A. (2018): <https://www.thegef.org/sites/default/files/publications/PLASTICS%20for%20posting.pdf>

⁷⁵ Barra, Ricardo & Leonard, Sunday A. (2018): <https://www.thegef.org/sites/default/files/publications/PLASTICS%20for%20posting.pdf>

critical to sustainable energy systems. However, the production, use and disposal of petrochemical-derived products present a variety of climate, air quality and water pollution challenges that need to be addressed.

While substantial increases in recycling and efforts to curb single-use plastics are underway, especially in Europe, Japan and Korea, the impact these efforts can have on demand for petrochemicals is far outweighed by sharply increasing plastic consumption in emerging economies.

To address these challenges, the report outlines a Clean Technology Scenario (CTS), which provides an alternative future in line with key UN Sustainable Development Goals, such as climate action, responsible production and consumption and life below water, among others.

The scenario provides an ambitious but achievable pathway to reduce the environmental impacts of petrochemicals: air pollutants from primary chemicals production decline by almost 90% by 2050; direct CO₂ emissions reduce by nearly 60%; and water demand is nearly 30% lower than in the base scenario. It also emphasises waste management improvements to rapidly increase recycling, thereby laying the groundwork to more than halve cumulative, ocean-bound, plastic waste by 2050.

In the CTS, petrochemicals become the only growing segment of global oil demand. Despite near-tripling in plastic waste collection by 2050, the limited availability of cost-effective substitutes for oil feedstock means that oil demand for petrochemicals remains resilient.

The IEA's Future of Petrochemicals report was developed with input from governments, industry and other key stakeholders, and seeks to bring the sector the attention it deserves in the global energy policy debate. It also provides ten key policy recommendations to build a more sustainable and efficient petrochemicals industry.⁷⁶

3.2. Indirect Environmental Challenges

3.2.1. Service delivery: Linear business models

Plastics are fundamental to our everyday life. Yet, they are one of the most wasteful examples of our existing linear, take-make-dispose economy. With 8 million tonnes of plastic entering the ocean each year, we urgently need to rethink the way we make, use and reuse plastics. Catalysing change through collaboration in this global material flow will not only create a more effective plastics system – but will also demonstrate the potential for a wider shift from a linear to a circular economy. An economy in which plastics never become waste.⁷⁷

⁷⁶ International Energy Agency (IEA). (2018, October 5): <https://www.iea.org/newsroom/news/2018/october/petrochemicals-set-to-be-the-largest-driver-of-world-oil-demand-latest-iea-analy.html>

⁷⁷ Ellen MacArthur Foundation. (2019): <https://www.ellenmacarthurfoundation.org/our-work/activities/new-plastics-economy>

3.2.2. Societal structure: Consumerism/overconsumption

Overconsumption has many facets including, unhealthy fast food, water waste, e-waste, the fashion industry with “trend” clothing, and deforestation due to paper and wood products. The fact that humanity, due to the consumption patterns among the rich, is living well beyond what the planet can sustain is well known, with the global population currently demanding 1.7 earths.⁷⁸

The challenge of consumption goes well beyond the capacity of technical solutions. As World Watch Institute noted in their “State of the World” 2010: “There has to be a wholesale transformation of values and attitudes”.

Overconsumption has a strong link to plastic.⁷⁹ Why does our society keep using single-use consumables even though the negative impact they have? Some claim that the root cause of this issue is the way humans – particularly the people in post-industrial societies – choose to consume. We don’t just use what we need, instead, we choose to devour our environment to create an excess of material for ourselves. One of the greatest factors in the use of single-use plastics is the societal desire for convenience. The challenge with overconsumption and linear material flows got wider recognition with the short movie “the story of stuff”.⁸⁰

A growing number of leading individuals, such as Dieter Rams, chief design officer at German electronics company Braun and whose work was a major influence on the designs of Apple, increasingly acknowledges the global problem of overproduction.⁸¹

The challenge to address overconsumption should not be underestimated as powerful interest sees any reduction in their markets as a threat. Obesity and other noncommunicable diseases kill people here and now and still governments struggle to address this. The challenge outlined by Dr Margaret Chan, Director-General of the World Health Organization, in the following quote is relevant for plastics contribution to overconsumption, not only food, but generally for natural resources use.⁸²

Efforts to prevent noncommunicable diseases go against the business interests of powerful economic operators. In my view, this is one of the biggest challenges facing health promotion.

As the new publication makes clear, it is not just Big Tobacco anymore. Public health must also contend with Big Food, Big Soda, and Big Alcohol. All of these industries fear regulation, and protect themselves by using the same tactics.

⁷⁸ Global Footprint Network. (2019): <http://data.footprintnetwork.org/#/>

⁷⁹ Plastics Industry Association. (2019): <https://www.thisisplastics.com/environment/the-purpose-of-single-use-plastics/>

⁸⁰ The Story of Stuff Project, website. (2019). <https://storyofstuff.org/>

⁸¹ Jordahn, Sebastian. (2019, March 5): <https://www.dezeen.com/2019/03/05/dieter-rams-documentary-gary-hustwit-interview/>

⁸² Chan, Margaret. (2013, June 10): https://www.who.int/dg/speeches/2013/health_promotion_20130610/en/

Research has documented these tactics well. They include front groups, lobbies, promises of self-regulation, lawsuits, and industry-funded research that confuses the evidence and keeps the public in doubt.

Tactics also include gifts, grants, and contributions to worthy causes that cast these industries as respectable corporate citizens in the eyes of politicians and the public. They include arguments that place the responsibility for harm to health on individuals, and portray government actions as interference in personal liberties and free choice.

This is formidable opposition. Market power readily translates into political power. Few governments prioritize health over big business. As we learned from experience with the tobacco industry, a powerful corporation can sell the public just about anything.

Let me remind you. Not one single country has managed to turn around its obesity epidemic in all age groups. This is not a failure of individual will-power. This is a failure of political will to take on big business.

Plastics can provide important contributions to a sustainable development, but in order for measures to be more than incremental improvements in unsustainable systems it will be necessary to analyze and address plastics strategic role in our current resource intensive and linear economy.

4. Approaches by companies to a Circular Economy

“Circular solutions” has become a very popular concept among companies, policy makers, media and consultants working with sustainability.⁸³ As with any concept it can be used in different ways. It is therefore important to understand what kind of contributions a company is providing when they claim to use a “circular approach” or support a “circular economy”. Below three different illustrative approaches are described that different ways companies and policy makers use the idea of a circular economy. The three approaches are:

- a waste driven approach
- a value chain focused approach, and
- a societal challenge focused approach.

The product approach is the minimalistic approach that is important part of a comprehensive strategy, but also the part that many unsustainable companies use to divert focus from their core business.

In this first category we find companies like Nike with great visions such as “Use the power of sport to create a zero waste future and healthier planet”.⁸⁴ But is among those companies we also find initiatives like “Nike's first footwear subscription service for children” that was just launched in August 2019.⁸⁵ Recycling and “product as a service” are important concepts, but not in this way. Nike manages to present an overconsumption driven business model where the company wants parents to provide between four pairs to 12 pairs (!) a year for children between 2-10. What kind of consumption patterns and sustainability values that a company has that think that children between two and 12 need a dozen different sneakers a year is the important question to discuss for global sustainability? But instead they have managed to frame the discussion around “recycling” and a “circular economy” in a way that avoids almost all important questions for global sustainability.

This is obviously only one example from one company, but similar overconsumption activities – that are in no way compatible with sustainable resource use on planet where more than 7 (and soon more than 10) billion people can live good lives – are plentiful among leading brands.

The challenge is that these companies fund and lead much of the discussions related to sustainability. In this case the example is in fashion/apparel, and other companies play a similar role in other sectors such as furniture, fast food, soft drinks, energy, mining, and cars.

⁸³ Explore search interest for Circular economy by time, location and popularity on Google Trends at Google Trends, website. (2019): <https://trends.google.com/trends/explore?hl=en>

⁸⁴ Nike, website. (2019): <https://purpose.nike.com/nike-grind>

⁸⁵ Nike. (2019, August 12): <https://news.nike.com/news/nike-adventure-club>

It is important to note that it is not Nike itself that is the main problem, but the role they are given by other companies, policy makers, NGOs, and media and those arranging conferences. Many of the groups mentioned are also funded by Nike and similar companies. These groups help shape a view where global sustainability is moved to the side and details on how unsustainable companies can recycle and tweak their business models on the margin with the help of “circular economy”.

A few examples where Nike is active with their circular approach together with other companies that do not want to discuss the more fundamental role of fashion and apparel in society:

- They are an Ellen MacArthur Foundation global partner.⁸⁶
- They are part of the “Make fashion circular” initiative.⁸⁷
- They have also produced material about circular design for others to use.⁸⁸
- They are a frequent participant at events discussing sustainability and the role of companies such as World Economic Forum.⁸⁹

The examples above might not sound very flattering, but it is important to note that Nike is not among the worst companies. If anything, Nike is actually among the leading companies in the first category. There are companies in this first category without any strategy for sustainability and where the sustainability work is led from the PR department of the company. There are even examples where a company is purchasing offsets and calling themselves “climate positive” while selling meat hamburgers at the same time as IPCC scientist publish reports that makes it clear that we must do the opposite, ensure that we reduce red meat significantly.⁹⁰ Often these kinds of product focused initiatives are very much focused on the brand, and are sometimes even launched at events that focus on the brand rather than actual impact.⁹¹

⁸⁶ Ellen MacArthur Foundation. (2016, May 11): <https://www.ellenmacarthurfoundation.org/news/nike-global-partner>

⁸⁷ Ellen MacArthur Foundation. (2019): <https://www.ellenmacarthurfoundation.org/our-work/activities/make-fashion-circular>

Ellen MacArthur Foundation. (2019): <https://www.ellenmacarthurfoundation.org/our-work/activities/make-fashion-circular/participants>

⁸⁸ Nike, website. (2019): <https://www.nikecirculardesign.com/>

⁸⁹ World Economic Forum. (2019): <https://www.weforum.org/organizations/nike-inc>

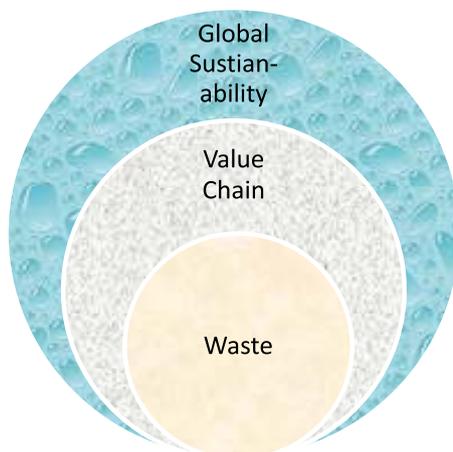
Nike. (2014, January 27): <https://news.nike.com/news/nike-inc-promotes-circular-economy-at-world-economic-forum>

Farrag-Thibault, Angie. (2014, May 6): <https://www.bsr.org/en/our-insights/blog-view/clean-cargo-working-group-transparency-and-transformation-in-ocean-transport>

⁹⁰ Max Hamburger Restaurants has taken step in the right direction by introducing more vegetarian and vegan options. It is therefore extra unfortunate that they undermine these serious initiatives with PR work that lack links to IPCCs P1 pathway. Schiermeier, Quirin. (2019, August 8). <https://www.nature.com/articles/d41586-019-02409-7>

⁹¹ Watson, Alison. (2018): <https://sustainablebrands.com/read/walking-the-talk/the-world-s-first-climate-positive-burgers-max-burgers-now-help-fight-climate-change>

The second group is taking things a step further and take things as far as possible with a traditional sustainability perspective. They look at the value chain from a sustainability perspective. Paul Polman's work in Unilever⁹², BTs work to deliver smart climate solutions,⁹³ and IKEA's earlier work with People and Planet Positive⁹⁴ are three examples in this category.



The third group, still dominated by start-ups, are companies with a purpose to make the world a better place and where the aim with the company is to deliver an overall positive impact in society. Instead of an inside-out approach to sustainability, these companies also use an out-side in approach. These are often companies that need to grow fast.

In addition to the three approaches we can also assume that some companies also use the idea of circular solutions for pure greenwashing in order to shift focus from other issues such as labor condition, tax evasion, destruction of biodiversity, significant carbon emissions, etc. As experts at UN have highlighted, there is a challenge when companies cherry-pick certain sustainability actions as it becomes what can be called “SDG Washing”.⁹⁵

⁹² Sustainia. (2019, February 5): <https://goexplorer.org/ceos-must-be-activists-paul-polman/>

⁹³ BT Group plc. (2018): https://www.btplc.com/Purposefulbusiness/Deliveringourpurpose/2018summary/documents/DoP_2018_3ClimateChange.pdf

⁹⁴ It is unclear if this has turned into a PR project, not asking the fundamental questions about IKEA's business model and impact in society, but initially it was aimed at asking how IKEA could support an overall positive development.

IKEA. (2012, updated 2014): https://www.ikea.com/ms/en_US/pdf/reports-downloads/sustainability-strategy-people-and-planet-positive.pdf

⁹⁵ Eccles, Robert G. & Karbassi, Lila. (2018, April 2): <https://sloanreview.mit.edu/article/the-right-way-to-support-the-uns-sustainable-development-goals/>

4.1. Waste focus: Avoiding Landfill and Increasing Renewable Materials

The most basic interpretation of circular economy is a recycling economy with a waste focus. This is illustrated well in the pictures below.⁹⁶

The starting point is the existing product, not the whole value chain, and definitely not the needs in society and global sustainability.

The aim is to ensure that the product with a reasonable probability does not directly go to land-fill. Sometime the “circularity” is achieved by collecting the waste in recycling bins in OECD countries and then ship the waste to China or Africa.⁹⁷

The companies engaging in this are often just trying to comply to laws while keeping the costs as low as possible. Many of the companies engaged in this kind of circularity work have products that are unsustainable and unhealthy, where the best outcome for sustainability is as few products from these companies as possible. For such companies there is a strong incentive to not discuss the sustainability of e.g. fast food, fossil vehicles, fast fashion and fast electronics.

Definition

In a circular economy the value of products and materials is maintained for as long as possible and waste and resource use are minimised.

Key Business Model Innovation Drivers

Compliance and branding as well as some cost savings.

System boundaries

The existing product is the focus.

Result

A circular Economy Level 1 minimises waste through recycling existing materials and products.

Examples

Nutrition: A bottle that is recycled

Mobility: A car that is repaired and then recycled

Spaces: Building material that is recycled

Textile: Fabric being recycled

A waste focus focuses on existing products and minimises waste through reusing, repairing, refurbishing and recycling existing materials and products.

⁹⁶ European Parliament Research Service, website. (2019): <http://www.europarl.europa.eu/thinktank/infographics/circulareconomy/public/index.html>

École des Ponts business school, website. (2019): <https://pontsbschool.com/circular-economy-sustainable-development/>

⁹⁷ European Commission, website. (2019): http://ec.europa.eu/growth/industry/sustainability_en

Key questions

- How can the product avoid landfill?
- How can I increase the recycled content in the product to create a demand for my recycled product?

A simplified example

A copy machine that is recycled, and maybe use some recycled material during production. The product looks the same and the business models does not change.

4.2. Value chain focus: Product as a Service for Sustainable Resource Efficiency

Circular economy with a value chain focus expands the perspective beyond the produced product and includes the whole system of production and use of the product itself. This allows for business models that start already with the design of the project and the resource efficiency over the value chain.

Definition

The circular economy is maximizing the value and use of our resources, by designing more efficient systems. It is based on three principles:

1. Design out waste and pollution
2. Keep products and materials in use
3. Regenerate natural systems

Business model innovation drivers

Total cost of ownership, digital opportunities and green markets

Result

A circular economy with a system focus, not only minimises waste in existing systems through recycling of existing materials and products, it optimises the existing product for optimal lifetime use and upgradability.

Examples

Nutrition: A bottle that is made from renewable or reused material and is designed to be refilled multiple times

Mobility: A car that is designed in modular ways so that parts can easily be changed and updated for longer lifetime.

Spaces: A building that is designed so that it can be upgraded and used for multiple purposes. Planning for falling costs in areas such as solar PV is integrated from the design phase

Textiles: Textiles that are made of sustainable material in a resource-efficient way, e.g. using enzymes that do not require high temperatures during colouring, made to last and designed to be repaired if needed.

While the first level, the product focus, focused on the existing product, the value chain focus includes the full value chain and opens up for providing the product as a service.

The incentive for the company when moving to a system focus and providing the product as a service is to design the product to last longer and be built in modules that can be changed if needed.

Many of the key aspects are captured in the OECD illustration below. This illustration includes two parts. One is about resource recovery. The other more efficient resource use and use of renewable material.⁹⁸

Key questions

- How might we make our product or service more modular/adaptable?
- How might our product be inspired by living systems?
- How might we turn our product offering into a service?
- How might our product be refurbished over time?⁹⁹

A simplified example

A copy machine as a service where the user pays per copy rather than for the copy machine. This allows the company manufacturing the copy machine to design the product so it lasts as long as possible. This tends to result in module-based design where different parts can be changed during the lifetime of the product. Such an approach also makes it easier to design the product so that all parts can be recycled in the best possible way.

4.3. Sustainable Need: Global Sustainability as a Driver

Circular economy with a focus on sustainable needs shifts the perspective, from the product and system for producing this, to what actually is needed. In other words, the perspective shifts from inside-out to outside-in.

For most companies this is very difficult, especially those with significant investments in equipment and manufacturing facilities. This is also why many companies does not make the sustainable transitions that might look obviously from the outside.

Instead of asking how e.g. a CD can be produced better (inside-out) this perspective asks what the most sustainable way of providing music is (outside-in).

The sustainable need perspective embraces the new transformative opportunities that are provided in the 4th industrial revolution and the need for

⁹⁸ OECD. (2018): <https://www.oecd.org/environment/waste/policy-highlights-business-models-for-the-circular-economy.pdf>

⁹⁹ Circular Design Guide, website. (2019): <https://www.circulardesignguide.com/post/brainstorm-circular-solutions>

globally sustainable solutions. This can be contrasted with the product and system approaches that use new technologies to improve old business models, in most cases only focusing on relative improvements, not what is needed from a global and equity perspective.

Key questions

How do I make sure that I meet the need in society in a sustainable way and what is the circular regenerative society that I then will contribute to?

A simplified example

Here the focus shifts from the copy machine to the need for material to read. Instead of only having a paper-based solution the company can now move towards a system that helps customers to move towards solutions where paper is not needed. Such a business model allows the company to establish a credible relation with customers and secure revenue streams as their customers shift towards a cloud-based and collaborative environment. Instead of viewing new resource efficient solutions as a threat the company can embrace it.

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Appendixes: Four illustrative cases

Appendix 1: Bending the linear plastic flow

Case one: Coca-Cola the No. 1 provider of both sparkling and still beverages.

As one of the leading plastic polluters on the planet, due to more 1.9 billion servings of beverages in more than 200 countries each day,¹⁰⁰ Coca Cola has said that they want to reduce waste from plastic bottles for soft drinks by supporting increased recycle and increase recycling content in the bottles.¹⁰¹

Food and beverage packaging is currently an accepted and integrated part of our modern lives, but it is not clear how much of that we actually need. The world has a packaging problem that the polluters has a responsibility to help solve.

Coca Cola has clarified that they want to invest in packaging innovations, “collect a bottle or can for every one they sell, and work together with partners to address waste challenges”. This is a very incremental approach and it is not obvious that this is a contribution to global sustainability or a distraction from the transformative change needed.

Coca cola has for example recently made statement such as:

In 2017, we worked internally to create an industry-first, ambitious goal to help collect and recycle the equivalent of every bottle and can we sell globally by 2030.

This statement focusses on existing bottles, with increased recycled content” and just “equivalent” takeback of bottles. This puts them squarely in the most incremental spot on the innovation matrix (see below). This is not to say that Coca Cola does not have more ambitious and innovative approaches, but it is what they put highest up on their webpage.

As one of the largest polluters on the planet, and with a product that is linked to obesity and diabetes it is reasonable to assume that we will see more ambitious initiatives from coca cola moving forward.

Similar approaches can be seen from H&M where the simple focus on take-back is even more problematic as fibers in clothing can't be recycled with the same material value very many times, sometimes not even once. Recycling in this case becomes a shift from burning the clothing directly to using them in some simple application and then burning the material.

All such companies should start by clarifying what value they provide to society and then open up for a discussion about possible ways forward.

¹⁰⁰ <https://www.worldofcoca-cola.com/about-us/coca-cola-beverages-products/>

¹⁰¹ <https://www.coca-colacompany.com/stories/sustainability/2018/taking-action-toward-a-world-without-waste>
<https://www.coca-colacompany.com/stories/beyond-the-bin-coca-cola-invites-americans-to-rethink-the-possibilities-of-plastic-waste>

Coca colas current value proposition is “The Coke Side of Life” which they claim represents happiness when you open up a can of coke or any other Coca-Cola product. If the only thing they provided was happiness when a person opens a bottle it would be easy to turn coca cola into a sustainable company. Unfortunately, people also tend to drink what’s inside. With incentive to gloss over important health issues it is easy to see how Coca Cola also can become part of a deeper problem where marketing and lobbying focus on establishing a carefree lifestyle where important issues in society are ignored. The same is true for the fast fashion industry that have incentives to focus on incremental takeback systems, rather than the question about creating insecurity among people, particularly young girls and boys, related to how they look rather than what they do and contribute to in society.



Appendix 2: Providing key need without plastic (Water)

Case two: Bluewater providers of water purifiers.¹⁰²

The vision for Blue Water is to deliver pure water to everyone, everywhere that tangibly do good for the people using them. The company believes that everyone is entitled to drink water free of contaminants that clean drinking water is a basic human right.

Bluewater exists to provide to provide customers at home or at work water purifiers that give them water as pure as nature intended.

Companies like Bluewater could become part of a cluster that helps create an infrastructure in cities around the world where people could get free pure water could directly reduce the plastic for water bottles if the system was supported by use of multi-use bottles.

In its basic form the company is built on existing disruptive technologies. The business model could also support a public financed infrastructure where drinking water is provided for free as a human right, perhaps even with an integrated resource transfer so that rich countries can innovate and help build up sustainable water infrastructure in poor countries.

For the company to increase the sustainability contribution beyond water it could also build on the access to fresh water with support for increased health knowledge, and support education that would result in reduced acceptance for single use bottles. With such supporting measures this new infrastructure could also reduce the need for the kind of products that soft drink providers currently provide.



¹⁰² <https://www.bluewatergroup.com/>

Appendix 3: New delivery systems

Case three: Gram: A new kind of grocery store that aims for zero waste.¹⁰³

Gram use a smart low-tech high market innovation approach to the reduction of plastic. They use a basic delivery system to showcase that much of the packaging is unnecessary.

The company is interesting as the company highlights to important, and often hidden, aspects of the global plastic challenge in relation to food.

1. Where the food is consumed
2. How we consume the food

With reduced packaging it is harder to transport many goods over long distances. This approach support local and fresh products that tend to taste better and be more nutritious.¹⁰⁴

Instead of high-tech solutions Gram changed the way products are sold by getting rid of unnecessary packaging. These kinds of solutions are often ignored as they do not fit very well in the tech-oriented solution agenda that dominate many institutions today.

The approach by Gram is now spreading and large companies like Waitrose are exploring similar systems together with many smaller.¹⁰⁵

With support companies like Gram could also help accelerate innovative distribution system, such a peer-to-peer farming solutions and support new packaging systems for refilling.

¹⁰³ <https://grammalmo.se/>

¹⁰⁴ https://www.canr.msu.edu/news/7_benefits_of_eating_local_foods

¹⁰⁵ https://www.bbc.co.uk/news/amp/business-48498346?__twitter_impression=true#.XPdpRps5NGk.buffer

<https://www.scotsman.com/news/environment/morrisons-the-first-supermarket-to-ban-fruit-plastic-packaging-1-4931199>



Appendix 4: Providing healthy nutrition for 11 billion people

Case four: Gigafood: A Catering company for global sustainability¹⁰⁶

Gigafood is a organic plant-based food company based on the latest science combined with an ethics base on the idea that 10 billion people in the future should be able to live well and sustainable. Humanity is facing a shift. As we will soon to be ten billion people on this earth there is a need for companies that are based on global needs and sustainability.

One of the main assumptions is that animal agriculture is a leading cause of climate change, deforestation, water consumption and pollution. It is responsible for more greenhouse gases than the transportation industry and it is a primary driver of rainforest destruction, species extinction, habitat loss, topsoil erosion, ocean “dead zones” and virtually every other environmental ill.

The potential of business models like Gigafood was demonstrated recently when they were selected as one of the 100 solution providers and presented at Mission Innovation ministerial meeting in Vancouver. Gigafood was one of the companies with the largest potential to help reduce emissions. Preliminary estimations indicate that Gigafood’s business model could help reduce greenhouse gases more than 100 million tonnes.¹⁰⁷

Gigafood approach sustainability from a holistic perspective and studies show that it is possible to make nutritious food within planetary boundaries, only through upgrading to plant-based eating. They also see this shift as an opportunity to make people feel better, prevent disease and performing at your highest level.

Giga also stands for the digital era. How will food industry – the way we produce, order and eat our food – look in the future? What is exciting from now on? Gigafood was founded to explore in what ways food service can be developed digitally, so delicious nutritious sustainable food can be accessible for as many people as possible.

The contrast between companies like Gigafood that produce sustainable and health food that is compatible with global sustainability and a 1.5C development path can be contrasted with unsustainable fast-food companies that thought offsetting try to claim that they show leadership. A better understanding of a circular economy and global sustainability could help companies, journalists, policy makers and customers make better informed choices, so they support sustainable innovation rather than greenwashing.¹⁰⁸

¹⁰⁶ <https://gigafood.se/om-gigafood/>

¹⁰⁷ <https://www.misolutionframework.net/solutions/mi4/name>

¹⁰⁸ <https://www.resume.se/nyheter/artiklar/2019/04/04/max-falls-for-klimatpositiv-marknadsforing/>



Incremental Circular Economy as a Serious Sustainability Problem

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How to turn the focus on circular economy into a driver for global sustainability

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The authors assume sole responsibility for the contents of this report, which therefore cannot be cited as representing the views of the Swedish EPA.

This paper explores how different interpretations of circular economy result in different approaches to sustainability. The aim is to provide guidance for companies, intrapreneurs in companies and organisations working with circular economy by providing a structure to understand different approaches and the outcome of these.

On the one hand it is obvious that we need to move away from linear material flows in society towards more circular flows. On the other hand, it is also obvious that the way some unsustainable companies, from fast fashion companies to car companies, are using the incremental interpretations of the concept circular economy is diverting the conversation away from their unsustainable business models.

In this paper the “plastic challenge”, with focus on plastics role for nutrition and health in society, is used as a case to illustrate different ways to understand the relation between business model innovation and a circular economy.

Three categories of circular economy strategies are introduced:

- Product focus: Avoiding Landfill and Increasing Renewable Materials
- Value-chain focus: Product as a Service for Sustainable Resource Efficiency
- Global sustainability focus: Global Sustainable Production and Consumption as a Goal and Driver

