A Toivo Report:

AND YET IT CIRCULATES

AN ABSTRACT

Based on the Toivo Think Tank book "And yet it circulates: Five outlooks on building a circular European economy"

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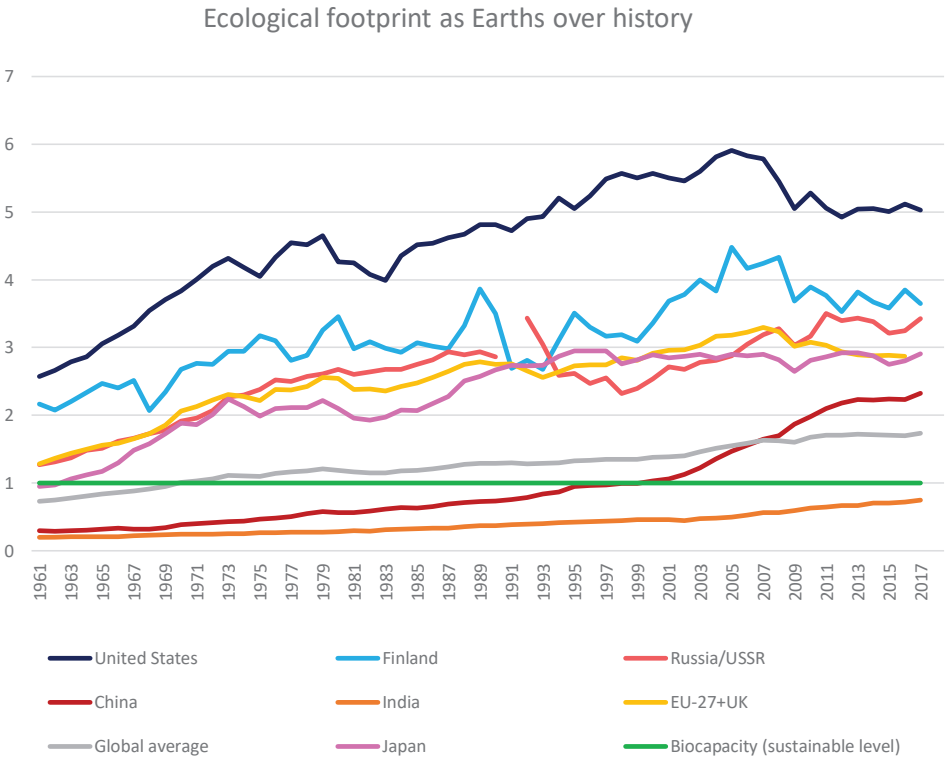
Paradigms do not change easily. The prevailing truths are often deeply rooted in people's minds, although the facts might show otherwise. A change requires a transformation in the whole fundamental way of thought. We long believed that Earth is the centre of everything: like the Moon, so do the planets, the Sun, and ultimately the entire universe orbit this world, endowed by our Creator for us, the humankind, to control. This worldview worked for a long time and made sense, but as the knowledge increased, its basis became more and more fragile and unstable. Based on the models of pioneers like Nicholas Copernicus, and his own empirical observations, Galileo Galilei argued that the reality is twofold moving: the earth revolves around itself, but with the other planets, also orbits the Sun. The truth did not immediately become accepted, but it had nonetheless been found. *E pur si muove*. And yet it moves.

The impact on the geo- and anthropocentric cosmology was revolutionary, and today hardly any of us believe in the old Ptolemaic star models. But still we haven't fully surpassed our increasingly fragile, one-dimensional and people-centred worldview. One such paradigm coming to its endpoint is related to extractive consumption and material-centric economic growth.

For a long time, the most significant part of economic growth has been based on finding, exploiting and consuming new natural resources in ways that increase our material standard of living. The earth was seen as boundless: there was always something to discover, new minerals to be mined, new shorelines on the horizon. Even increasing resource efficiency has not fundamentally changed this model: a product's lifecycle still begins with the extraction of resources, and at the end of its life, the resources used end up in the landfill with the product—or in the air to warm our atmosphere.

A Faustian bargain

In Goethe's rendition of the well-known legend Dr Faust is frustrated by the limits of his knowledge, power and pleasure, and in order to achieve even more he enters into an agreement with Mephistopheles, the Devil. At the moment of Faust's greatest happiness, Mephistopheles finally tries to take his soul to get his part of the deal. It is not surprising that the *Faustian bargain* has been used at times as an allegory for our present-day society.



Footprints of various countries and the EU-27+UK. The graphs show how many Earths would be needed if everyone in the world lived like people in the country do. Thus, the increase in global population must also be considered when valuating per capita carrying capacity as more people use the same finite resources every year. York University Ecological Footprint Initiative & Global Footprint Network. (2020). https://data.footprintnetwork.org/

In a limited world, the borders will necessarily be reached. According to York University's Ecological Footprint Initiative, it already takes 1.7 years to renew the resources consumed every year—this is represented by Earths (Figure 1), and if this overconsumption continues to grow as it is does today, it will take even much more to meet demand in the future. Although the ecological footprint of the European Union has peaked and is now in slight decline, we still use 2.87 times our own sustainable share in 2017.[1]

Also, the percentage of circularity in the world economy has lately only decreased, which is due to the fact that consumption grows currently faster than the circular economy.[2] For example, the consumption of textiles is increasing and the number of times a piece of clothing is used is decreasing year by year. It is estimated that by 2050, the textile industry would use a quarter of our carbon budget and the amount of microplastics ending up at sea would have increased by 22 million tonnes.[3]

At the same time, nature is experiencing irreversible destruction. The last 50 years have seen a half of all tropical rainforest lost,[4] and many of the remaining are nearing a final tipping point[5]. Every eighth animal species is on the verge of

1 York University Ecological Footprint Initiative & Global Footprint Network. (2020). Ecological Footprint of Countries 2017. https://data.footprintnetwork.org/ **2** Circularity Gap Report 2020. Circle Economy. **3** Ellen MacArthur Foundation. (2017). A new textiles economy: Redesigning fashion's future. http://www.ellenmacarthurfoundation.org/publications **4** IUCN (2017). Issues Brief: Deforestation and forest degradation. https://www.iucn.org/sites/dev/files/deforestation-forest_degradation_issues_brief_final.pdf **5** Lovejoy, T. E. & Nobre, C. (2019). Amazon tipping point: Last chance for action. Science Advances, 5(2). https://advances.sciencemag.org/content/5/12/eaba2949

extinction.[6] The average global temperature has risen by 1.1 °C since pre-industrial times[7]—many times faster than expected in the Arctic[8]—and to limit global warming to less than 1.5 degrees, emissions need to be reduced by 7% every year.[9]

The physics is therefore indisputable and solving overconsumption and environmental crises is crucial, and necessity of that is not a political question. How to solve them, instead, is.

The longer the necessary decisions are postponed, the more expensive and riskier it will be to build a sustainable economy and society. This unavoidably builds pressure on the ruling parties that have built the current system, making radical and revolutionary solutions increasingly attractive. In particular, the years since the release of the last IPCC report have brought with them a number of grassroots movements increasingly hungry with their demands. These have especially been favoured by young people, which have lost confidence in the ability of the current economic and political system to solve the crisis at hand. As time passes, those who do not offer solutions will inevitably be seen as part of the problem.

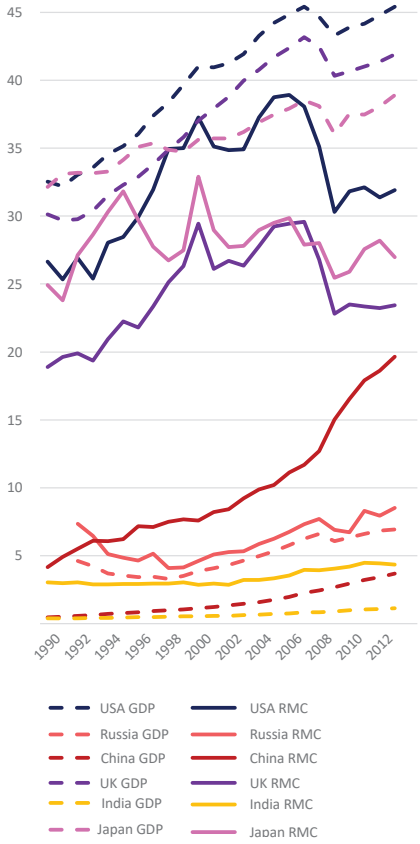
To maintain our current level of well-being, by 2050 resource efficiency must be increased four to tenfold, and at the same time, we need to turn nature's deteriorating carry-

6 IPBES (2019). Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. E. S. Brondizio, J. Settele, S. Díaz, and H. T. Ngo (editors). IPBES secretariat, Bonn, Germany. **7** World Meteorological Organization (2020). WMO Statement on the State of the Global Climate in 2019. WMO-No. 1248. https://library.wmo.int/doc_num.php?explnum_id=10211 **8** World Economic Forum (2020). Global warming: Scientists 'stunned' by how much ice we've lost. https://www.weforum.org/agenda/2020/08/arctic-sea-ice-global-warming-climate-change-predictions/ **9** United Nations Environment Programme (2019). Emissions Gap Report 2019. UNEP, Nairobi.

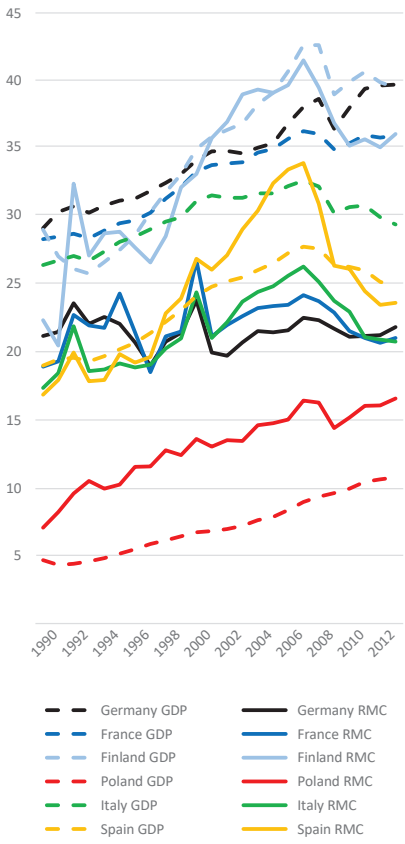
ing capacity back into growth.[10] In this light, it is all too easy to argue our only choice is to pull the emergency brake: turn economic growth around and downwards and rebuild the whole society and the political system in line with radical utopias. However, we have come so far that a return may not be possible anymore—nor even desirable.[11] Although we might be able to think of, if needed, being content with our current standard of living or giving up a part of it—if it is even possible in the political-economic reality—this kind of reversal is not realistic for all the 7.8 billion that make up the world's population. But there is another way, if only we succeed in annulling the Faustian bargain.

10 Directorate-General for Environment. (2011). Charting a path towards resource efficiency. European Union. https://ec.europa.eu/environment/efe/news/charting-path-towards-resource-efficiency-2011-05-01_en **11** McAfee, A. (6.10.2020). Why degrowth Is the worst idea on the planet. Wired. https://www.wired.com/story/opinion-why-degrowth-is-the-worst-idea-on-the-planet/

Raw material consumption (tons RME) per capita vs GDP per capita (thousands of constant 2005 USD)



Raw material consumption (tons RME) per capita vs GDP per capita (thousands of constant 2005 USD) — Largest EU countries plus Finland



Comparing changes in countries' raw material consumption and GDP is a good way to measure decoupling economic growth from material burden. RMC is calculated as the sum of domestic extraction and the imports minus the exports, all measured in "raw material equivalents" (RME) which also take into account all the raw materials needed to feed the supply chains ending in a country's consumption. All numbers are measured in per capita, as we are not investigating population growth here but the actual impact on people's lives. Our aim—an absolute decoupling—is achieved when the RMC decreases even when the economy grows, but as we can see, we have still a long way to go. materialflows.net / UN IRP Global Material Flows Database. 2020.

Towards a circular future

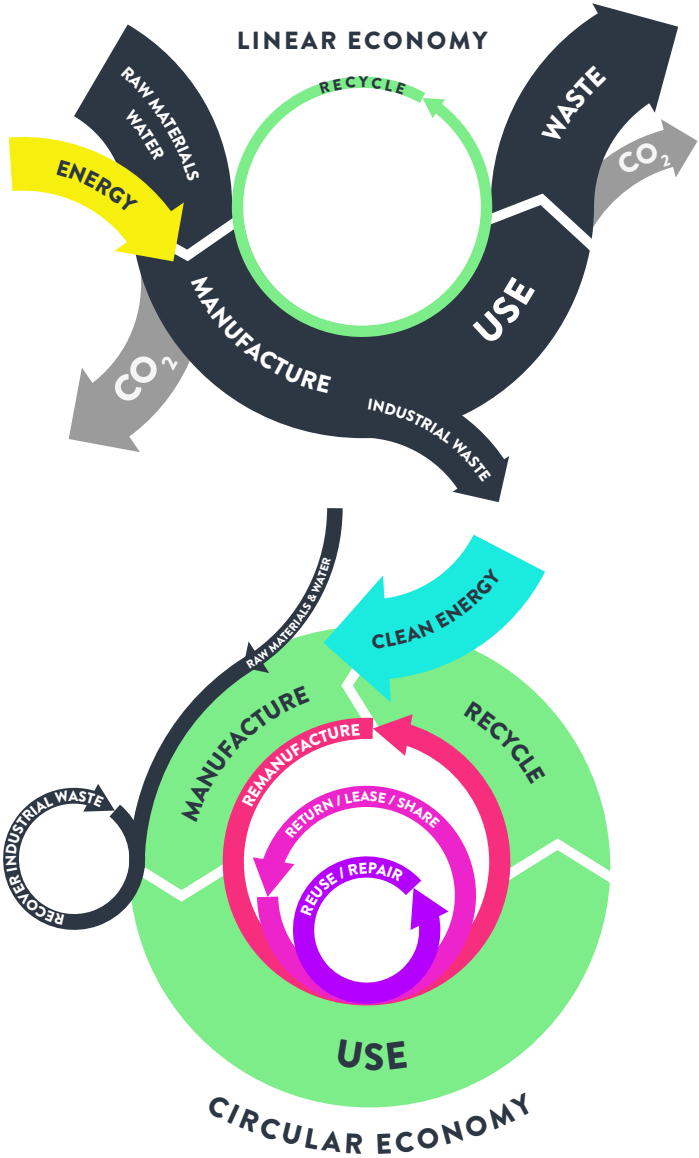
The paradigm must change. The linear model of economy must be bent into a circle: the end of a product's life cycle must be connected to the beginning. By tackling the resource challenge, we can also achieve another important goal, climate change mitigation, as the circular economy makes it possible to reduce emissions in non-energy sectors, which account for almost a half of greenhouse gas emissions.[12]

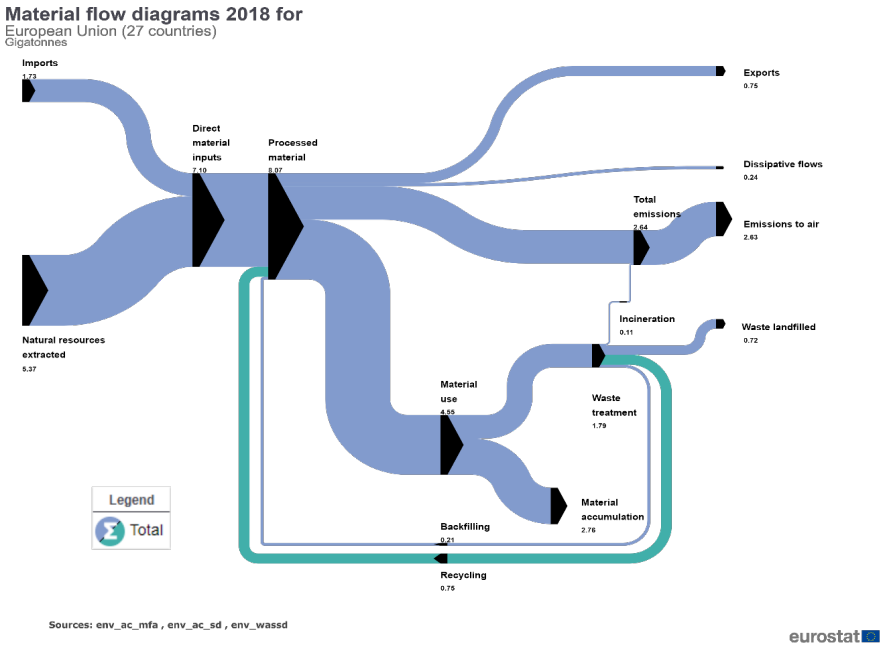
According to the Ellen MacArthur Foundation, the circular economy, i.e., circularity, pursues three goals: planning out of waste and pollution, preservation of products and materials, and restoration of natural systems.[13] The transition to a circular economy is not possible by only making recycling more efficient, as the products themselves must be made durable, repairable, upgradable and reusable. Only at the end of this life cycle is there the actual reuse of materials.

Read more: Sirpa Pietikäinen – From linearity to circularity – European way and solutions

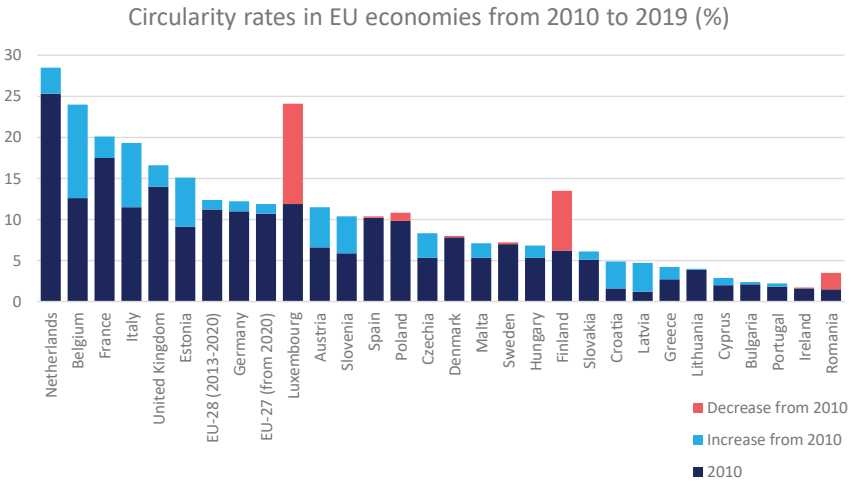
12 Ellen MacArthur Foundation. (2019). Completing the Picture: How the Circular Economy Tackles Climate Change. https://www.ellenmacarthurfoundation.org/publication. **13** Ellen MacArthur Foundation. (2017). What is the circular economy? https://www.ellenmacarthurfoundation.org/circular-economy/what-is-the-circular-economy

Comparing a linear economy and a circular economy. In a circular one many new business opportunities emerge, products are kept in use longer and—by definition—there is no waste.





The European Union is a typical modern economy—predominantly linear. Eurostat. (2020).



Estimations of the size of a country's circular economy as a percentage of the overall economy. Eurostat. (2020).

Currently, about 12% of the EU's material flows remain circulating in cycle and reuse, with the Netherlands leading the way with a circularity rate of 24.5%.[14] In Finland, the rate has fallen to only 7%, while in the world it is 8.6% on average.[15] Why, despite all its advertised functionality, has the circular economy not yet taken off on a larger scale than this?

According to the Finnish Government's strategic development program for the circular economy, there are three reasons for this: inadequate pricing of the use of natural resources, which does not generate sufficient demand for circular economy products, decades of investment in linear economy structures and incompatibility of the current legislation with circularity.[16]

How can these goals be achieved in various sectors of the economy? The authors of the book this report accompanies, Mrs. Sirpa Pietikäinen, Mrs. Saara-Sofia Sirén, Mrs. Laura Eiro, Mr. Samuli Patala and Mr. Jonne Hirvonen, have written what exactly needs to be done in sectors such as transport and materials, and what policies have to be used to achieve the set goals. The purpose of this report is to provide a brief overview of these essays and summarise what actions are required in each sector.

14 Circularity Gap Report 2020. Circle Economy. **15** Statistics Finland, preliminary statistics 2020. Indicators for circular economy. **16** Finnish Government, steering group for the circular economy promotion program (2020). Kiertotalous – taloutemme uusi perusta. [The circular economy - the new foundation of our economy]. https://figbc.fi/wp-content/uploads/sites/4/2020/11/001.-KARHINEN-Kiertotalous-ohjelma.pdf

CIRCULAR ECONOMY

- Product-as-a-service and the leasing economy
- Sharing economy
- Extending product lifespan
- Recyclability
- Reuse of resources
- Renewable and clean energy
- Regenerating natural systems

Raw materials and energy

An ideal economy would run as a fully closed loop. However, new raw materials need to be constantly fed into the system, and behind this there are at least two clear root causes. First, materials wear out in a cycle and their chemical and physical properties change with use and over time, so they must be constantly replaced. Second, not all products are designed to be recycled: they may contain additives, components, or mixtures that are difficult to recycle economically. In order to close the raw material cycle, it is necessary to constrain these factors.

That is why we still need significantly new raw materials in order to build a new economic model, materials that are preferably renewable, high-quality and recyclable. Therefore, it is also instrumental new products are designed with this in mind. For example, if we are to achieve rapid growth in the production of electric cars, it must be ensured that, at the same time as recycling becomes more efficient, battery technology also develops in accordance with the principles of sustainability and recyclability.

The same change must also be brought about in more commonplace areas, as e.g., plastics, textiles, and electronics often contain difficult-to-reuse materials. It is therefore not enough to merely develop recycling technologies, as tackling the challenge also requires state-level measures and cross-border co-operation, such as legislation and new standards to support circularity already at the design phase.

ADVANCING CIRCULARITY IN RAW MATERIALS AND ENERGY

- The circular economy starts with smart design
- International standards can ensure the durability and recyclability of products
- Development of recycling technologies
- Channeling agricultural subsidies to modernization and local self-sufficiency
- Enough affordable and sustainable energy and smart

All processes from plastic recycling to recovering nutrients from sewage require a lot of energy. In general, producing from recycled materials is always more energy-intensive and expensive than the use of virgin raw materials, and this is also an economic challenge in bringing about circularity. Processing the materials is not the only expenditure, but a significant amount of energy is also spent on collecting and sorting recycled materials.

The simple solution is to minimize unnecessary transport. This is why at the very heart of the circular economy are local closed loop systems. For example, agriculture produces a lot of nutrient-rich waste and simultaneously consumes a lot of nutrients in the same location, so closed loops could be easily built on-site. Furthermore, local nutrient cycle and e.g., outselling of biomethane would create new economic opportunities for rural areas. However, such modernization requires significant public guidance and funding,[17] and therefore a clearly larger share of the EU's agricultural budget should be spent on developing both economic and material self-sufficiency.

It is also possible to reduce transport by pre-treating the materials. Often this means condensing and drying the substances. However, this too requires a lot of low-cost energy, and it therefore must be said that maintaining cycles in any case requires a lot of sustainably produced energy.[18] In the

17 Ministry of Economic Affairs and Employment of Finland. (28.1.2020). Työryhmältä ehdotukset biokaasun kannattavuuden kohentamiseksi. [Proposals from the working group to improve the profitability of biogas]. https://tem.fi/-/tyoryhmalta-ehdotukset-biokaasun-kannattavuuden-kohentamiseksi **18** VTT. (26.8.2019). Circular economy of the future requires a lot of clean energy. https://www.vttresearch.com/en/news-and-ideas/circular-economy-future-requires-lot-clean-energy

future, though, we won't be able to rely on as stable and demand-responsive energy production as we have long been accustomed to.

Energy production based on fossil fuels has declined in Europe, and although a part of it has been replaced by biomass use, a significant load of clean energy is nowadays highly weather-dependent solar and wind, supported by nuclear energy that is contrarily steady but difficult to adjust to electricity demand.[19] While hydropower and some temporary combustion can still be used for load following and storage and battery technology is evolving, we will nevertheless need to adapt to much more significant fluctuations in energy production and electricity market prices in the future. This will require new and closer co-operation between producers, consumers and storers. Legislators must also answer this call.

Read more: Jonne Hirvonen – Closing the material loop: achieving resource efficiency with circular methods

19 Eurostat. (2020). Energy statistics - an overview. https://ec.europa.eu/eurostat/statistics-explained/index.php/Energy_statistics_-_an_overview

Industry and textiles

Most of the change needs to happen in industry. The circular economy creates many new business models for companies: industry can e.g., use recycled materials as raw material and also provide its own by-products to customers for recycling. Companies can also reverse the supply chain: collect used products from their customers and either resell the products or use them as raw material. The change is not quite simple: challenges to be overcome can be found in the cross-industry flow of information, transparency of quality and product information, lack of technology and scalability of solutions.

The textile industry is a particularly challenging sector for sustainable development with its long production chains. Firstly, the production of textiles is very raw material-intensive, for example, cotton production requires huge amounts of water and land area. The clothing sector also accounts for one-tenth of industrial CO2 emissions and produces more than a third of marine microplastics. Moreover, its social impact cannot be forgotten: much of the industry is outsourced to low-cost countries, where human rights violations, wage ambiguities and inhumane working conditions are undeniable problems. Likewise, the rate of circularity in the industry is still extremely low: only 1% of textile material is reused in a true closed-loop manner.[20]

20 Ellen MacArthur Foundation. (2017). A New Textiles Economy: Redesigning fashion's future.

ADVANCING CIRCULARITY IN TEXTILES

- Recycling textile waste
- Recycled and bio-based materials
- Chemical recycling
- Promoting the repair economy and second-hand trade
- Circularity criteria for public procurement
- Standards, ecolabels and traceability
- Information sharing and cross-industrial recycling ecosystems

In Finland, the textile and fashion industry has undergone considerable structural change in recent decades. The sector, firstly growing fast after the war, has since, with rapid globalisation, moved almost entirely to low-cost countries.[21] However, innovations in digitalisation, materials and business models are creating growth potential for the sector in Europe as well. The potential is most significant in the transition to the circular economy.

Several pioneers have emerged in Finland in the 2010s. One example has appeared in the intersection of the textile and forestry industries, where new types of fibres have been

21 Tekstiiliteollisuusmuseo. (2006). Suomen tekstiiliteollisuuden tarina. [Story of the Finnish textile industry]. http://www.tkm.fi/lehdistokuvat/tekstiiliteollisuusmuseo/Lue_historia.pdf

created from wood-based materials. New business models have also emerged around recycled textiles, chemical recycling and the utilisation of surpluses.[22] With the new EU directives obliging the collection of textile waste, the recycling infrastructure has also developed, and this development has extended from consumer waste to industrial waste collection.[23] Brand new solutions are not always even required as the trade of second-hand clothing and renting clothes[24] can also be considered part of the circular economy, since they significantly extend the lifespan and increase utilisation of products. These developments show that the circular economy has already begun to develop in the textile sector and created new industry in Europe, but there is still a long way to go for the business to become mainstream.

How the transition of the fashion and textile sector to a circular economy be promoted in the EU? The simplest step is to extend the life cycle of textile products. By changing VAT, it would be possible to encourage the use of repair services and second-hand clothing as a competitive alternative to the purchase of new clothing. Secondly, consumption must also be directed towards circular economy products. In addition to financial incentives, it is possible to support consumer decision-making with standards and labels that make it easier to guarantee the environmental performance of products. The

22 e.g. new Finnish innovators Pure Waste Textiles, Infinited Fiber and Ioncell and the large manufacturer Finlayson. **23** Tekstiilien kiertotalous etenee: Poistotekstiilien jalostuslaitos avataan Paimioon 2021. [Circularity in textiles is progressing: A textile waste processing plant will be opened in Paimio in 2021]. (18.8.2020). https://www.stjm.fi/uutiset/poistotekstiilien-jalostuslaitos-paimioon/
24 e.g. Finnish Vaatepuu and Lindström.

public sector is also a major buyer of workwear,[25] so adding circular economy criteria for public procurement is an easy way for politicians to promote development of the market. Facilitating the development of cross-industrial recycling ecosystems[26] and ensuring the free flow of information can also improve product traceability and at the same time promote the recycling of materials and the treatment of textile waste in the clothing sector.

Read more: Samuli Patala – Circular business models in textile industry: facilitating the shift

25 Dodd, N. & Gama Caldas, M. (2017). Revision of the EU Green Public Procurement (GPP) Criteria for Textile Products and Services. European Commission. https://ec.europa.eu/environment/gpp/pdf/criteria/textiles_gpp_technical_report.pdf **26** Patala, S., Salmi, A., Bocken, N. (2020). Intermediation dilemmas in facilitated industrial symbiosis. Journal of Cleaner Production, 261. https://doi.org/10.1016/j.jclepro.2020.121093

Transport and logistics

The transport sector is responsible for almost a quarter of Europe's greenhouse gas emissions and is the main source of air pollution in cities. Despite its large impact, the sector has not yet achieved the same emission reductions as other sectors.[27] It's not surprising indeed that the EU's current objectives call for an immediate systemic change in transport. The main goal in bringing circularity into transport is to achieve the same coverage and convenience more sustainably and with less materials.

At present, passenger cars cover more than 80% of passenger traffic, almost half of urban land is reserved for transport, and transport is the second largest household expenditure. However, the average car spends 95% of its time parked, and the necessary emission and cost efficiency is not achieved in logistics either.[28]

However, the opportunities in the transport sector are vast. Considering Mobility as a Service (MaaS), it is a growing market that is estimated to grow to USD 1.75 trillion by

27 European Environment Agency, https://www.eea.europa.eu/data-and-maps/indicators/transport-emissions-of-greenhouse-gases/transport-emissions-of-greenhouse-gases-12, The European strategy for low-emission mobility. (2016). European Commission. https://ec.europa.eu/transport/themes/strategies/news/2016-07-20-decarbonisation_en **28** Material Economics. (2018). The Circular Economy a Powerful Force for Climate Mitigation - Transformative innovation for prosperous and low-carbon industry. https://media.sitra.fi/2018/05/04145239/material-economics-circular-economy.pdf

ADVANCING CIRCULARITY IN TRANSPORT

- Mobility as a service (MaaS)
- More efficient use of infrastructure
- Low emission forms of energy
- Automation and the digital infrastructure required for smart modes of transport
- Durable and long-lasting materials
- Public procurement and public transport based on circularity

2028.[29] MaaS is one of the means to facilitate a fair transition to a low-emission, safe, automated and highly consumer-oriented transport system.

A lot of development is already happening in Europe, but there is still work to be done. Politicians must set clear target levels for emission reductions and circularity and thus ensure companies a predictable operating environment. Compatibility and integration of everything with data is essential in the development of smooth, diverse travel and logistics chains. Close monitoring and traceability will help achieve the set circular economy goals. Therefore, the development of a dig-

29 BIS. (2018). Global Mobility as a Service Market. https://bisresearch.com/industry-report/mobility-service-market.html

ital internal market and an advanced data policy will enable European companies to develop scalable circular economy services for the global market as well.

Incentives imposed by fiscal policy also play a particularly important role. This includes e.g., enhanced construction of charging infrastructure, incentives for electric vehicles, personal incentives for choosing alternative transport methods and reducing subsidies favouring private cars. Pricing should also encourage efficiency in logistics. However, the policies must also advance a fair transition, as public acceptance for the new economic model is essential. Environmentally friendly vehicles typically require higher initial investment than conventional vehicles and may therefore be beyond the reach of many consumers and businesses.

We also need a coherent policy on investment in digital infrastructure and RDI. Public sector funding at both national and EU level should always be linked to the promotion of the circular economy and the green economy. It is important to develop a common framework for measuring and evaluating project selection and the results, as well as overall progress in the EU. Public procurement and the know-how required for circularity procurement also play a major role. Examples of this are the modernization of public transport and the construction of circularity-based transport systems at the local level. Here, cities have a lot of leeway.

Read more: Laura Eiro – Politics can help untap the potential of circularity in transport and logistics

Cities and local policy

Urbanization is a global megatrend and one of the most essential developments of our time. According to the World Bank, more than a half of the world's population live in urban areas, and this share will increase to two-thirds by 2050.[30] At the same time as cities are gathering population and acting as engines of the global economy—accounting for 85% of global GDP generation—they are also aggregating resources and food. Globally cities consume more than 75% of natural resources, produce more than 50% of waste and emit 60-80% of greenhouse gases.[31] Therefore, the role of urban development in building a sustainable future will continue to grow in the future and it can be directed by zoning, infrastructure and use of technology.[32]

Alongside with urbanisation, a more culturally and politically independent role has also strengthened for the cities. This was seen for example when President Trump withdrew the United States from the Paris Climate Agreement, when major U.S. cities still decided to continue their policies of

30 The World Bank. (2020). World Development Indicators. https://datacatalog.worldbank.org/dataset/world-development-indicators **31** Ellen MacArthur Foundation. (2017). Cities in the Circular Economy: An Initial Exploration. https://www.ellenmacarthurfoundation.org/assets/downloads/publications/Cities-in-the-CE_An-Initial-Exploration.pdf **32** Williams, J. (2019). Circular cities. Urban studies, 56(13), page(s): 2746-2762.wearestillin-america-will-meet-paris-agreement-despite-trump

ADVANCING CIRCULARITY IN CITIES

- Forerunning cities set an example
- National targets should also bind local policies
- Mapping of material flows at the city level
- Involving citizens, communities and businesses in joint commitments

building a sustainable future whatsoever the federal level decides.[33] The city of San Francisco, for example, set a goal of zero waste as early as 2002, and the city has since taken the lead in the ecological transition having nearly reached its goal.[34] A few years later, San Francisco and several other megacities founded the C40 network, its nearly 100 cities now representing more than 700 million people and a quarter of the world economy.[35]

The cities in the C40 network are committed to mitigating climate change and promoting sustainable solutions. In San Francisco itself, material efficiency, reuse, recycling, and composting have created thousands of jobs and halved the amount of waste between 2000 and 2015. Amsterdam, part of

33 Reuters. (2017). #WeAreStillIn: 'America will meet the Paris Agreement despite Trump'. https://www.reutersevents.com/sustainability/ **34** San Francisco Department of Environment. (2020). Zero waste FAQs. https://sfenvironment.org/zero-waste-faqs#practices **35** C40. (2018). Municipality-led circular economy case studies. https://www.c40.org/researches/municipality-led-circular-economy

the network as well, is in turn seeking leadership in the transition to circularity and is now working towards mapping out all the material flows in the city.[36]

Although there are no cities of the C40 network in Finland, good examples are found, nonetheless. The city of Turku aims for carbon neutrality already in 2029, when the city turns 800 years old.[37] The target is one of the most ambitious in the world and shows how cities can sometimes set even more ambitious target levels than governments. The city also wants to be an international pioneer in circular economy solutions, with a special focus on promoting participation.[38]

Turku believes that success in the circular economy is based on the participation of citizens, communities and companies. Through common goals, different participants have found that smart solutions lead not only to a safer and more sustainable future, but also to new business and growth opportunities. Indeed, cities around the world have shown that concrete action is not only possible but also profitable. However, the circular economy cannot be left to the sole responsibility of a few cities, and there is no room for free riders. A more sustainable future requires system-level planning, strategic cooperation and decisions at every political level.

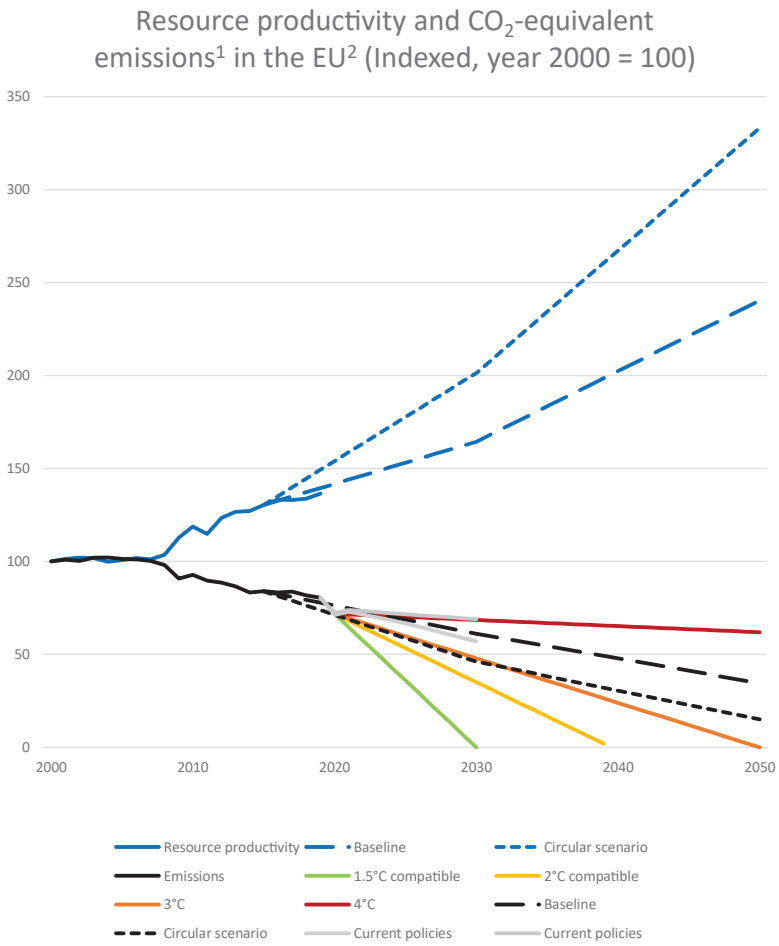
Read more: Saara-Sofia Sirén – Are cities the main hubs of the European economy—in a circular one as well?

36 C40. (2018). **37** City of Turku. (2019). Turku vastaa vahvasti ilmastonmuutokseen. [Turku answers climate change strongly]. https://www.turku.fi/blogit/kohti-vuotta-2029/turku-vastaa-vahvasti-ilmastonmuutokseen **38** Circular Turku. (2020). A blueprint for local governments to kick start the circular economy transition. https://e-lib.iclei.org/publications/Turku-report-web.pdf

Concluding thoughts

The private sector has already begun to show increasing interest in the business opportunities opened up by the circular economy transition, which are a win-win for both the economy and the environment. By 2018, jobs related to the circular economy in the EU have grown to four million, and the application of the principles of the circular economy to the whole economy is estimated to create 700,000 new—and more sustainable—jobs by 2030. A study by McKinsey calculates the grown resource productivity and the externality benefits achieved by this would at the same time increase the Union's GDP by extra 0.5% a year[39]. Similarly, the creation of closed material loops in Europe will also reduce our dependence on imported raw materials and can thus further strengthen our own economy. The transition to a low-carbon and sustainable economic model thus need not mean impoverishment—circular growth is also an economic opportunity.

39 McKinsey & Company. (2015). Growth within: A circular economy vision for a competitive Europe. https://www.mckinsey.com/business-functions/sustainability/our-insights/europes-circular-economy-opportunity



Although other measures are needed too, according to a scenario by McKinsey and the Ellen McArthur Foundation, applying circular economy principles in the EU can help bridge the emissions gap and increase resource productivity significantly at the same time. Resource productivity estimates are calculated from the GDP scenario and includes domestic material consumption of mobility, food, built environment, virgin automotive and construction material, virgin synthetic fertiliser, pesticides, agriculture land and water use, car and heating fuel, land for residential and office buildings and non-renewable electricity. Historical data for productivity by Eurostat (2020) and emissions and targets by Climate Action Tracker (2020). Estimates by McKinsey & Company. (2015).

1 gross emissions, not including LULUCF in 2018 compensating for 6,5% of the emission
2 historical data EU-27 excluding the UK, estimations pre-Brexit but based on percentual change

However, we have constantly underlined the urgency of the transition, and we cannot expect things to happen by themselves. How can we accelerate this change?

It is estimated that meeting the climate and energy targets in the EU will require € 260 billion a year. However, the funding does not have to be new investment or tax money, as a significant impact can be made by redirecting existing private investment—tens of trillions of euros—to projects that are building a more sustainable future. By making the political decisions that will enable Europe to become a forerunner in circular economy solutions and, if required, by providing actors with the needed push, the necessary investments will follow suit.

At the edge of a new paradigm the winners are those who, in their politics, do not remain on the defensive to protect the old world from inevitable change, but welcome the new world, the way of thinking, and the opportunities they open up with open arms. In the case of a systemic change, we really need to measure development and investment not at the level of election periods and quarters only, but over decades, while at the same time being able to make decisions of the future already in the present. Hopefully the book and this accompanying report will be helpful in this.

We might only be at the beginning of a long and rocky path, but we know where we are heading. All we have to do now is to take the necessary steps.

40 Communication "United in delivering the Energy Union and Climate Action - Setting the foundations for a successful clean energy transition" COM(2019) 285

WHAT THE EU IS DOING NOW

A European Green Deal[1]

- New Circular Economy Action Plan
  - » Legislative proposal for a Sustainable Product Policy Initiative, including potential product passports and the extension of the Ecodesign directive
  - » Legislative and non-legislative measures establishing a new "right to repair"
  - » Mandatory Green Public Procurement (GPP) criteria and targets in sectoral legislation and phasing-in mandatory reporting on GPP
  - » Review of the rules on end-of-life vehicles
  - » EU Strategy for Textiles 2021
  - » Strategy for a Sustainable Built Environment
  - » Waste reduction targets for specific streams and other measures on waste prevention
  - » Updating the Circular Economy Monitoring Framework to reflect new policy priorities and develop further indicators on resource use, including consumption and material footprints
- Renovation Wave, to refurbish and improve building stock in the EU to help to pave the way for a decarbonised and clean energy system
- Chemicals Strategy, to reduce the risks associated with producing and using chemicals
- Strategy for Sustainable and Smart Mobility, to ensure that we have a clean, digital and modern a transport sector

Read more: Sirpa Pietikäinen – From linearity to circularity – European way and solutions

1 https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en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