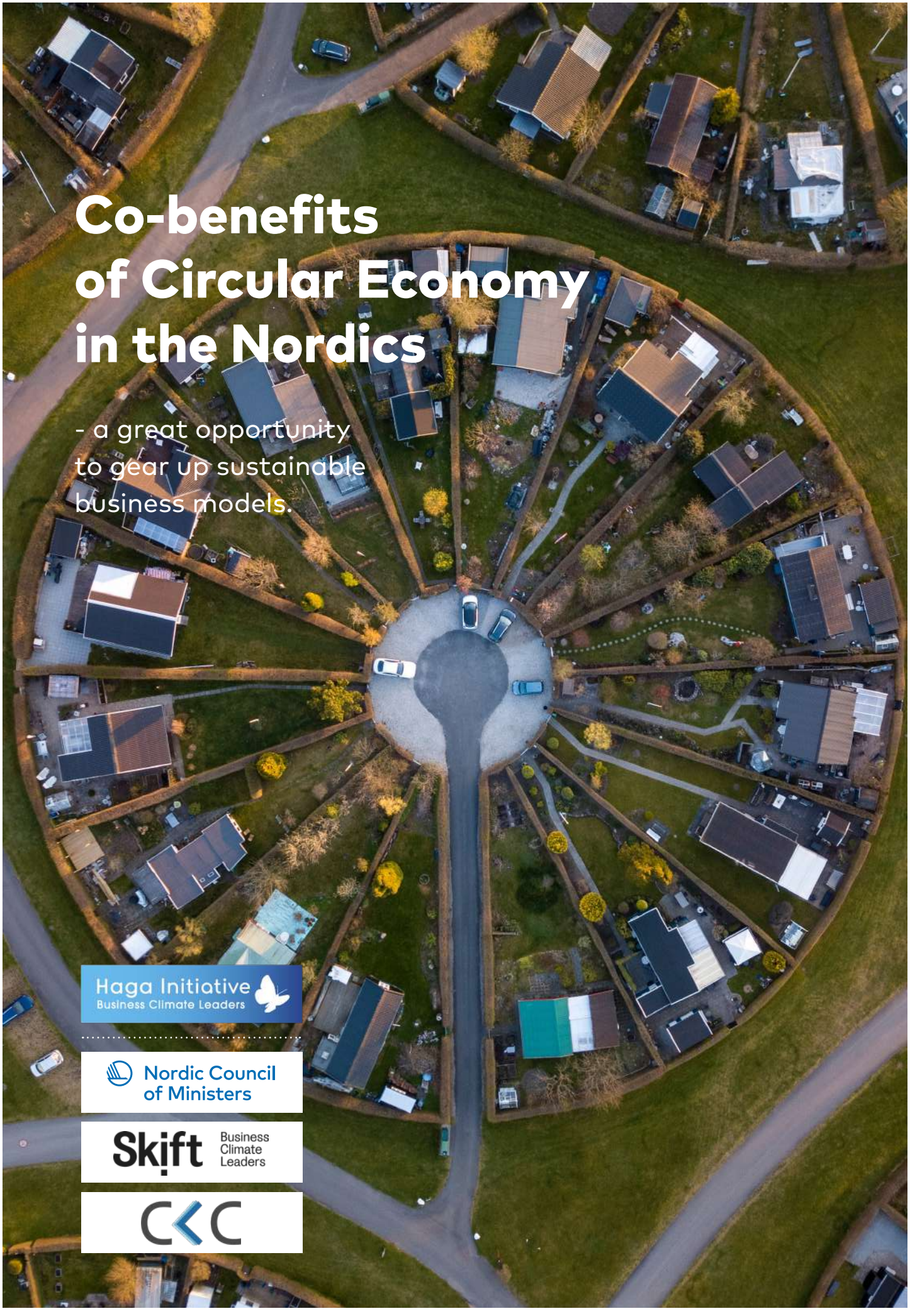

Co-benefits of Circular Economy in the Nordics

- a great opportunity to gear up sustainable business models.

Haga Initiative
Business Climate Leaders

Nordic Council of Ministers

Skift Business Climate Leaders

CKC

This report has been produced by the Haga Initiative within the vision project Climate Neutral Nordics. Climate Neutral Nordics consist of the Haga Initiative (SWE), Skift Business Climate Leaders (NOR), and Climate Leadership Coalition (FIN) and is financed by the Nordic Council of Ministers.

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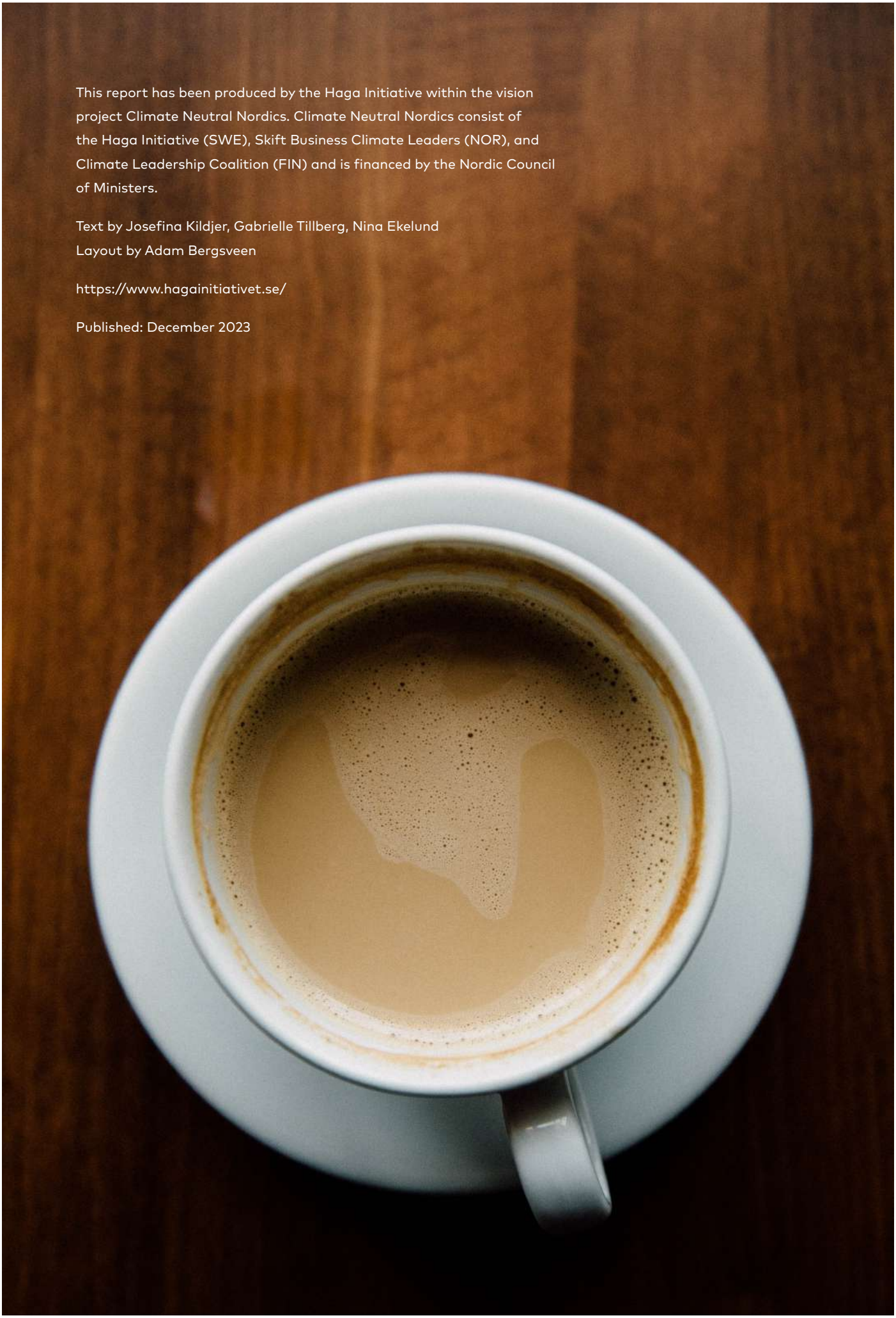


Contents

1. Executive Summary

Moving towards a circular economy is an essential part of the sustainable transition, and businesses are at the heart of this, driving innovation and developing new business models. However, the circular transition faces many barriers and progress has so far been very limited. One key challenge is that many of the positive impacts of the circular transition haven't been properly defined or assessed. In this report, we argue that by making visible the many co-benefits of circularity, policy makers and businesses are more likely to advance their efforts and accelerate the transition towards a more circular economy.

The report's focus is circularity and co-benefits in the Nordic region, looking particularly at economic growth, environmental impact and job creation. We will also highlight a few examples of co-benefits of circular solutions in practice and present four recommendations to Nordic policymakers:

- Support Nordic businesses to identify co-benefits of increasing circularity in their decision-making by creating a Nordic circular economy database
- Incentivize sharing knowledge and data between stakeholders around identified co-benefits of circular economy in the Nordics and methods for quantifying them
- Develop a practice of benchmarking public procurement processes against circular alternatives by considering co-benefits
- Designate a permanent coordinator to strengthen circular business solutions and promoting their co-benefits in the Nordic countries

2. Background

Nordic countries have been leading the way in environmental and climate policies and have shown that environmental protection and climate ambition can go hand in hand with economic growth, innovation, and a competitive business sector.

At the same time, many challenges remain, not least as regards circularity. Circularity rates in many material streams in the Nordics are remarkably low in comparison to the rest of the EU. One strategy to accelerate the development and adoption of circular solutions is identifying and promoting their co-benefits and showcasing the opportunities they create for reducing negative environmental impact, cutting down costs and tapping into new business opportunities.

Therefore, the purpose of the report is to:

1. Give an overview of co-benefits of circular economy
2. Showcase examples of co-benefits of through circular business solutions
3. Present recommendations to Nordic policymakers that can unlock co-benefits of the circular economy

The report is part of the project "Circular Business Models" on the Nordics as a leading region within circular and sustainable business models. This report has been produced by the Haga Initiative within the vision project Climate Neutral Nordics. Climate Neutral Nordics consist of the Haga Initiative (SWE), Skift Business Climate Leaders (NOR), and Climate Leadership Coalition (FIN) and is financed by the Nordic Council of Ministers. The report builds mainly on a pre-study conducted during 2021 where circular economy was highlighted as a key business opportunity for many businesses in the Nordic countries, and on the following report "Circular Business Models – Nordic

opportunities and challenges in the new political landscape"[1], published in February 2023. Said report highlighted four potential areas for closer Nordic cooperation within circular economy:

- A common Nordic circular economy strategy focusing on high potential solutions and value chains
- Exchange experiences on circular economy tax reform
- Exchange experiences and harmonization standards, definitions and access to data
- Knowledge transfer and learning from the frontrunners

This report takes a closer look at co-benefits – to what extent they can be identified and quantified and how Nordic actors can work together to promote the circular economy in the region.

1 Haga Initiative (2023). Circular Business Models – Nordic opportunities and challenges in the new political landscape

3. How circular business models can drive growth and generate co-benefits in the Nordics

While linear business models are based on the logic of taking natural resources and making consumer products that eventually become waste, circular business models source products and materials already existing in the economy and not from ecological reserves. They thereby create customer value, adding value to existing products and materials and creating valuable inputs for businesses beyond their customers.

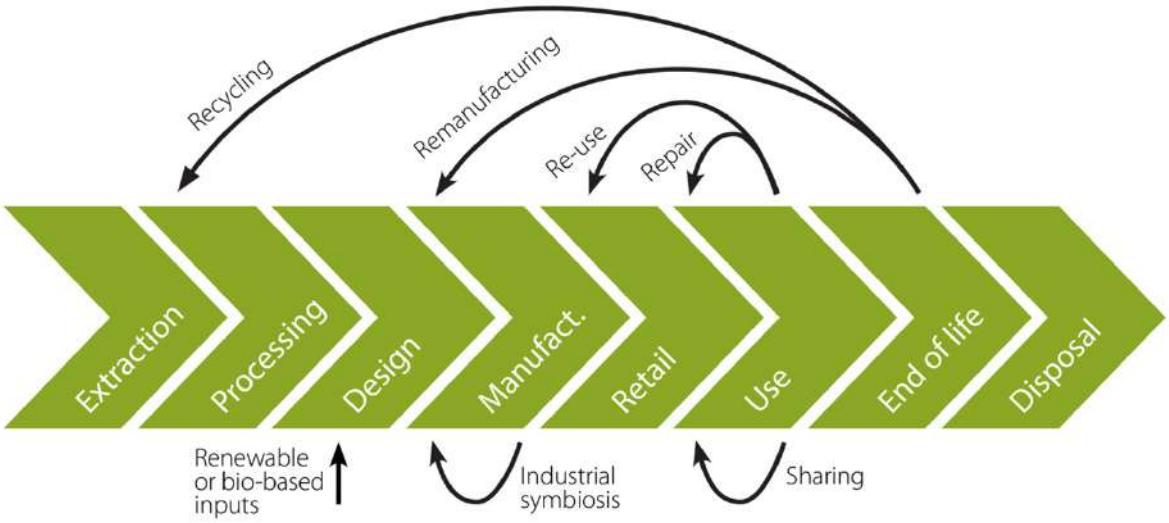


Figure 1 Circular business models operate in different parts of the value chain[2]

This reduces the negative environmental side-effects resulting from the extraction, use, and eventual disposal of natural resources and materials, enabled by both firm level improvements in material productivity, and from more radical changes in production and consumption patterns. Circular business models not only use natural resource inputs more efficiently,

2 OECD (2018). Business Models for the Circular Economy – Opportunities and Challenges from a Policy

generate renewable energy, and produce raw materials from scrap: they can also provide ways not to use them at all.[3]

3.1 Circular economy in the Nordics

Today 6 per cent of the Nordic economy is circular, meaning that 94 per cent of resources consumed in the economy are derived from virgin material resources. Nordic countries have been at this level of circularity for the past four years. This is well below the European average of 12 per cent. The difference between the Nordic and the European average circularity level is not explained by lower rates of recycling of secondary materials per se. Rather, it is driven by the Nordic region's high domestic material consumption of primary virgin materials, which is among the highest in Europe and roughly a factor of two relative to the EU average measured in metric tons per capita. The reasons behind these are e.g. the presence of important material-intensive and extractive industries, demographics, and large investments into material-intensive assets, such as infrastructure, buildings, and capital equipment.[4]

On the contrary, the Nordic region has mature recycling rates for most material streams, meaning that on general level a high percentage of the waste streams are recycled. As the exhibit below shows, one of the material streams with the highest potential of improvement is plastics, which while having only 2 per cent share of total waste flow, have a low 46 per cent recycling rate. Another example is concrete, which amounts to about 14 per cent of total waste flow and is only being recycled to 37 per cent. Wood, which accounts for 23 per cent of the Nordic region's waste generation, has a recycling rate of 10 per cent.

Metals, which constitute around 13 per cent of all waste, is currently being recycled at a rate of more than 90 per cent. This material stream is, in other words, relatively mature and

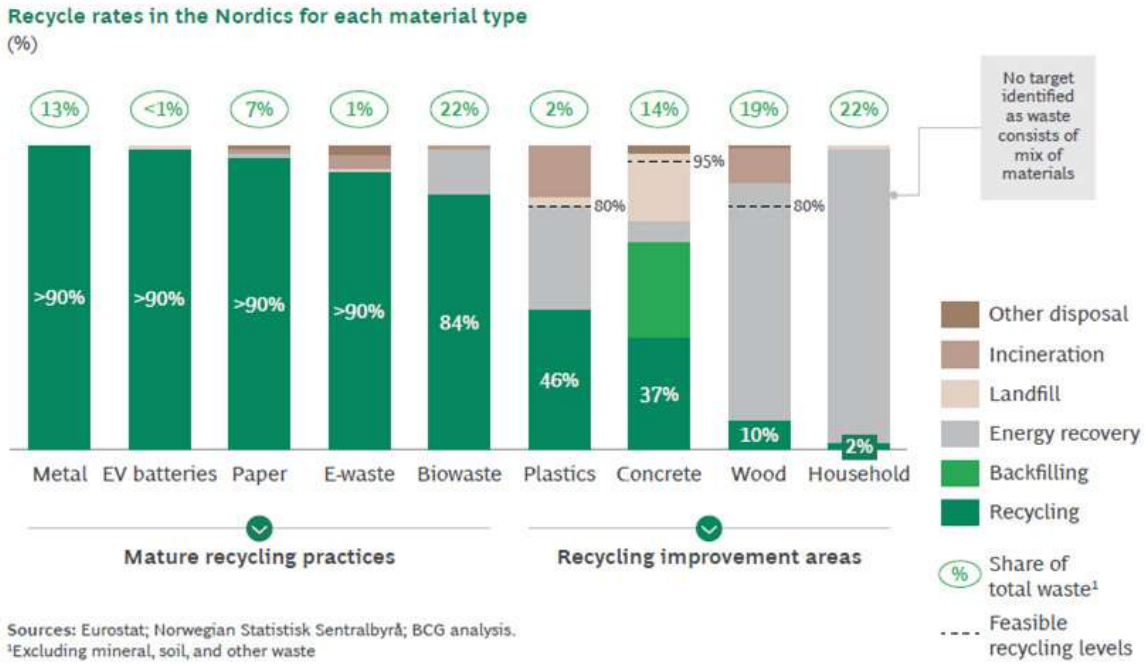
3 Haga Initiative (2023). Circular Business Models – Nordic opportunities and challenges in the new political landscape

4 Cornander (2023). Nordic Circular Economy: A pathway to sustainable growth and resilience, BCG Global. Available at: https://www.bcg.com/publications/2023/nordic-circular-economy-pathway-growth-resilience (Accessed: 27 September 2023).

well-functioning. This is likely explained by high demand, scarcity of recycled metals and high market value, increasing with the purity of the product.

Overall, these figures indicate room for improvement in recycling practices for all material streams, presenting an opportunity to further enhance circularity. While all Nordic countries have the opportunity to expand their recycling practices, it is important to recognize the structural differences between their economies, as these affect feasible recycling levels. Finland and Sweden both have industries characterized by heavy waste-generating activities, such as mining, that reduce the overall recycling levels.[5]

Exhibit 3 | The Nordic region has mature recycling rates for most material streams—with improvement potential in plastic, concrete, and wood



Sources: Eurostat; Norwegian Statistisk Sentralbyrå; BCG analysis.
¹Excluding mineral, soil, and other waste

5 The Nordic Supply Potential of Critical Metals and Minerals for a Green Energy Transition [P. Eilu et al. (2021)]

4. Co-benefits of circular economy

In this report we define co-benefits as the adjacent benefits, intentional or unintentional, generated when taking actions towards an increased circular economy and which create impact at a social level at large, but also from a business perspective. For society at large, these benefits could for instance be lower GHG emissions, reversing biodiversity loss, creation of job opportunities and improved public health. For businesses, co-benefits of investing in circular solutions could mean cost savings, securing input materials through secondary material streams, and increased competitiveness in unexplored business opportunities. The co-benefits in focus in this report are economic growth, environmental impacts (primarily reduced CO2 emissions) and job creation.

4.1 Co-benefit #1: Economic growth through circular economy

4.1.1 Nordic level

The estimated economic opportunity presented by the circular economy in the Nordic region by 2030 is substantial. In 2021, the circular economy contributed approximately €21 billion in gross value to the Nordic economy[6]. Assuming a consistent growth trajectory, this figure is projected to reach approximately €25 billion per year in 2030. Furthermore, if Nordic countries were to double their circularity levels in line with the EU's ambitions, the circular economy could contribute an additional €24 billion in gross value by 2030, reaching a total annual gross value of around €48 billion. This amount is equivalent to roughly 3 per cent of the Nordic GDP in 2021, instead of around 1.5 per cent.[7]

6 Eurostat (2023)

7 Eurostat (2023); Cornander (2023). Nordic Circular Economy: A pathway to sustainable growth and resilience, BCG Global. Available at: https://www.bcg.com/publications/2023/nordic-circular-economy-pathway-growth-resilience (Accessed: 27 September 2023).

In a more challenging scenario where Nordic countries achieve the EU's circularity ambition rate of 23.4 per cent, the added gross value could reach €72 billion, resulting in a total annual gross value of €96 billion, which is approximately 6 per cent of the Nordic GDP in 2021. These estimations underscore the significant economic potential that lies within the circular economy for the Nordic region.

Transitioning to a higher level of circularity in the Nordic region is estimated to unlock approximately €48 billion in annual economic opportunity by 2030[8]. This economic opportunity is similar to 3 per cent of the Nordic region's GDP in 2021[9].

4.1.2 Examples from countries

In terms of GDP impact, the implementation of different decoupling strategies in Sweden yields noteworthy results. Wijkman and Skånberg (2015) present three scenarios: the renewable-energy scenario (change to renewable energy), energy-efficiency (more efficient use of energy) scenario, and material efficiency scenario (more efficient use of materials).

The renewable energy scenario could lead to an improvement in the trade surplus equivalent to approximately 1 per cent of the country's GDP). Similarly, the energy-efficiency scenario also positively influences GDP by enhancing the trade balance with an increase of 0.2 per cent of GDP. Meanwhile, the material efficiency scenario significantly bolsters the trade surplus, exceeding 2 per cent of GDP. Combining all three decoupling strategies could result in a substantial improvement in the trade balance, exceeding 3 per cent of GDP, which translates to roughly 10 billion € annually.[10]

8 Cornander (2023). Nordic Circular Economy: A pathway to sustainable growth and resilience, BCG Global.

9 Wijkman, A. and K. Skånberg (2015), "The Circular Economy and Benefits for Society: Jobs and Climate Clear Winners in an Economy Based on Renewable Energy and Resource Efficiency", Study requested by the Club of Rome with support from the MAVA Foundation.

10 Ibid

In 2020, the circular material use rate in Finland was 4.5 per cent[11]. Estimates suggest that the circular economy could unlock substantial value potential for the Finnish economy, ranging from €2 to €3 billion by 2030[12].

4.2 Co-benefit #2: Environmental impacts of circular business models

4.2.1 Nordic level

In terms of material consumption in Nordic countries, each person utilizes approximately 23 tons, with only about 1.4 metric tons sourced from secondary materials, which clearly shows the predominance of virgin resources in the overall material consumption[13]. This is higher than the EU average volume of material consumption at around 14 metric tons per person[14]. In the Nordic region, improved circularity holds the potential to significantly reduce CO2 equivalent emissions. This includes reductions of 10-20 million tons by 2050, which equates to approximately 4-7 per cent of the total Nordic emissions in 2017[15]. Combining various country-level projections and estimates of the potential to substantially reduce Nordic countries' carbon footprint, shows a range between 42-68 percent. This shows significant potential through adoption of circular economy principles.

11 Tilastokeskus (2022). Statistics Finland, business | Statistics Finland. Available at: https://www.stat.fi/tup/kiertotalous/kiertotalousliiketoiminnan-indikaattorit_en.html (Accessed: 27 September 2023).

12 SITRA (2016). "Leading the cycle – Finnish road map to a circular economy 2016-2025'' (https://tinyurl.com/mg5kcbp)

13 Eurostat (2023)

14 EUROSTAT EU's material consumption (2022a) EU's material consumption: 14.1 tonnes per person in 2021 - Products Eurostat News - Eurostat. Available at: https://ec.europa.eu/eurostat/web/products-eurostat-news/-/ddn-20220715-2 (Accessed: 27 September 2023).

15 Material Economics (2019). Circular Nordics - How the circular economy can reduce greenhouse gas emissions in the Nordic Region.

4.2.2 Examples from countries

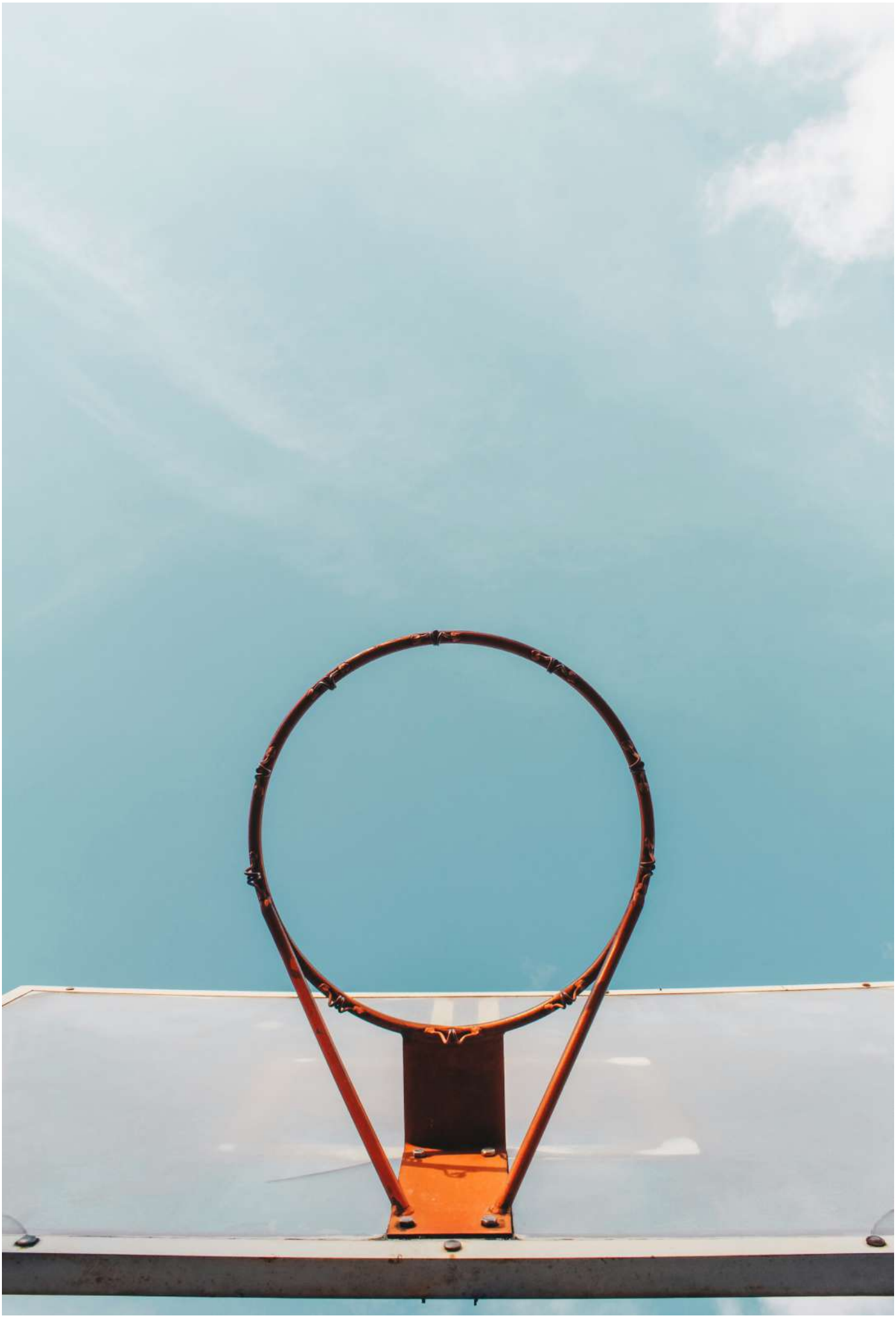
Sweden's circularity, as per the Circular Gap Report in 2022, stands at 3.4 percent, which is slightly below the global average. In Sweden, circular economy practices could result in substantial reductions of CO2 emissions, potentially as high as a 66 per cent decrease[16]. Implementing strategies to enhance energy efficiency could lead to substantial environmental benefits. For examples, organizing manufacturing along the principles of a materially efficient circular/performance-based economy, involving a 25 per cent increase in overall material efficiency, replacing half of virgin materials with secondary materials, and doubling the lifespan of durable consumer products, is estimated to reduce carbon emissions by approximately 10 per cent. However, it's essential to bear in mind that these outcomes are the result of specific assumptions and simulations, offering a theoretical glimpse into the potential economic and environmental impacts of these decoupling strategies on Sweden's economy and ecological footprint[17].

The tangible evidence of carbon emissions reductions through the adoption of circular economy principles is striking according to Wijkman and Skånberg's three decoupling scenarios:

- The renewable-energy scenario yielded an impressive 50 per cent reduction in carbon emissions
- The energy-efficiency scenario contributed to a notable 28 per cent reduction in carbon emissions
- The material efficiency scenario resulted in a 10 per cent reduction in carbon emissions

16 Wijkman, A. and K. Skånberg (2015), "The Circular Economy and Benefits for Society: Jobs and Climate Clear Winners in an Economy Based on Renewable Energy and Resource Efficiency", Study requested by the Club of Rome with support from the MAVA Foundation.

17 Wijkman, A. and K. Skånberg (2015), "The Circular Economy and Benefits for Society: Jobs and Climate Clear Winners in an Economy Based on Renewable Energy and Resource Efficiency"



Finland has been at the forefront of the circular economy. It has developed roadmaps for circular economy implementation and has integrated sustainability subjects into the curricula across all levels of education, from primary school to higher education and throughout professional life[18]. Circular economy practices in Finland could result in substantial reductions in CO2 emissions, potentially reaching a 68 per cent decrease[19].

Denmark's circular economy is currently only at a 4 per cent level, aligning with the generally low circularity metrics observed in its Nordic counterparts[20]. This figure, as highlighted in the recently published Circularity Gap Report Denmark, is primarily attributed to remarkably high material consumption, which stands at 24.5 tons of virgin materials per person annually[21]. Notably, this consumption level surpasses the global average by more than double.

Implementing circular economy principles has the potential to curtail material usage in Denmark by a substantial 39 per cent, paving the way for more sustainable resource management[22] and concurrently slashing the nation's carbon footprint by 42 per cent, thereby reinstating it within the ecologically safe boundaries of our planet[23].

18 World Economic Forum (2023). "Winning in Green Markets: Scaling Products for a Net Zero World" Available at: https://www.weforum.org/whitepapers/winning-in-green-markets-scaling-products-for-a-net-zero-world/

19 Wijkman, A. and K. Skånberg (2015), "The Circular Economy and Benefits for Society: Jobs and Climate Clear Winners in an Economy Based on Renewable Energy and Resource Efficiency"

20 Tuomala, I. (2023) Denmark's economy is 4 % circular, Nordic Circular Hotspot. Available at: https://nordiccircularhotspot.org/news-updates/gapreportsdenmark (Accessed: 27 September 2023).

21 Ibid

22 Tuomala, I. (2023) Denmark's economy is 4 % circular, Nordic Circular Hotspot

23 CGR Denmark (2022) Circularity Gap Reporting Initiative - Home. Available at: https://www.circularity-gap.world/denmark (Accessed: 27 September 2023).

4.3 Co-benefit #3: Job creation through a circular economy

4.3.1 Nordic level

Circular economy can contribute to more job creation which would more than offset jobs lost by the sharing economy. The Nordic region stands to gain economically from circular economy practices, as well as socially from the creation of new job opportunities. Combining projections at an aggregated level, as many as between 180,000 to 190,000 job opportunities could arise as a result of circular initiatives in the Nordics. This combined figure has been derived in different ways and scenarios, but nevertheless exemplifies the socio-economic gains that the Nordic region stand to make by switching to a circular economy.

4.3.2 Examples from countries

In the previously mentioned decoupling scenarios by Wijkman and Skånberg, they all exhibit promising job creation potential. Projections indicate that an additional 100,000 jobs could be created in Sweden through circular economy initiatives, which would contribute significantly to the country's economic prosperity. This comprehensive effort could potentially cut unemployment in Sweden by at least a quarter and conceivably even halve it. It's important to acknowledge that these figures are based on simulations and certain assumptions, providing a hypothetical glimpse into the potential impacts of these strategies on Sweden's GDP and employment landscape.

In the renewable-energy scenario for Sweden, approximately 50,000 additional jobs would be generated, equivalent to 0.1 per cent increase in employment. The energy-efficiency scenario shines even brighter, creating around 20,000 additional jobs, representing a substantial 0.5 per cent boost in employment. Furthermore, the material efficiency scenario shows great promise, with the potential to generate more than 50,000 additional jobs, equivalent to a notable 1-2 per cent increase in employment. What sets this scenario apart is the permanence of the jobs created, stemming from transformative changes in the goods-to-services ratio within the economy.

Projections indicate the potential creation of an additional 75,000 jobs in Finland through circular initiatives, contributing significantly to the region's economic prosperity[24].

By transitioning to a circular economy, Denmark can stimulate job creation and generate new employment opportunities, thus invigorating its labor market[25]. Denmark has the potential to create between 7,000–13,000 new jobs by 2035 by applying more circular economy principles[26]. To grow the number of jobs in the circular economy, Denmark may focus on increasing jobs in core circular sectors – waste management, repair, or renewable energy, for example – while encouraging collaboration from enabling and indirect sectors[27].

24 Wijkman, A. and K. Skånberg (2015), "The Circular Economy and Benefits for Society: Jobs and Climate Clear Winners in an Economy Based on Renewable Energy and Resource Efficiency"

25 Tuomala, I. (2023) Denmark's economy is 4 % circular, Nordic Circular Hotspot

26 Dakofa (2023) Denmark and the circular economy - Waste and Resource Network Denmark. Available at: https://dakofa.com/element/denmark-and-the-circular-economy/.

27 CGR Denmark (2022). Circularity Gap Reporting Initiative - Home. Available at: https://www.circularity-gap.world/denmark

4.4 Additional co-benefits

4.4.1 Halt or reverse biodiversity loss

A rapid transition to a circular economy could halt global biodiversity loss and start the process of biodiversity recovery, assuming no other action is taken globally, with biodiversity recovering to its 2000 levels by 2035[28]. Furthermore, the circular economy can halt and partly reverse biodiversity loss by 2035, through policy- and business-led interventions and helps mitigate climate change[29]. Although these projections are global and not specifically for the Nordic region, the same logic applies. There is much to benefit in the space of halting biodiversity loss by speeding up a transition to a circular economy. Not least against the backdrop that the extraction and production of materials contribute to 23 per cent of global greenhouse gases and 90 per cent of global biodiversity loss[30].

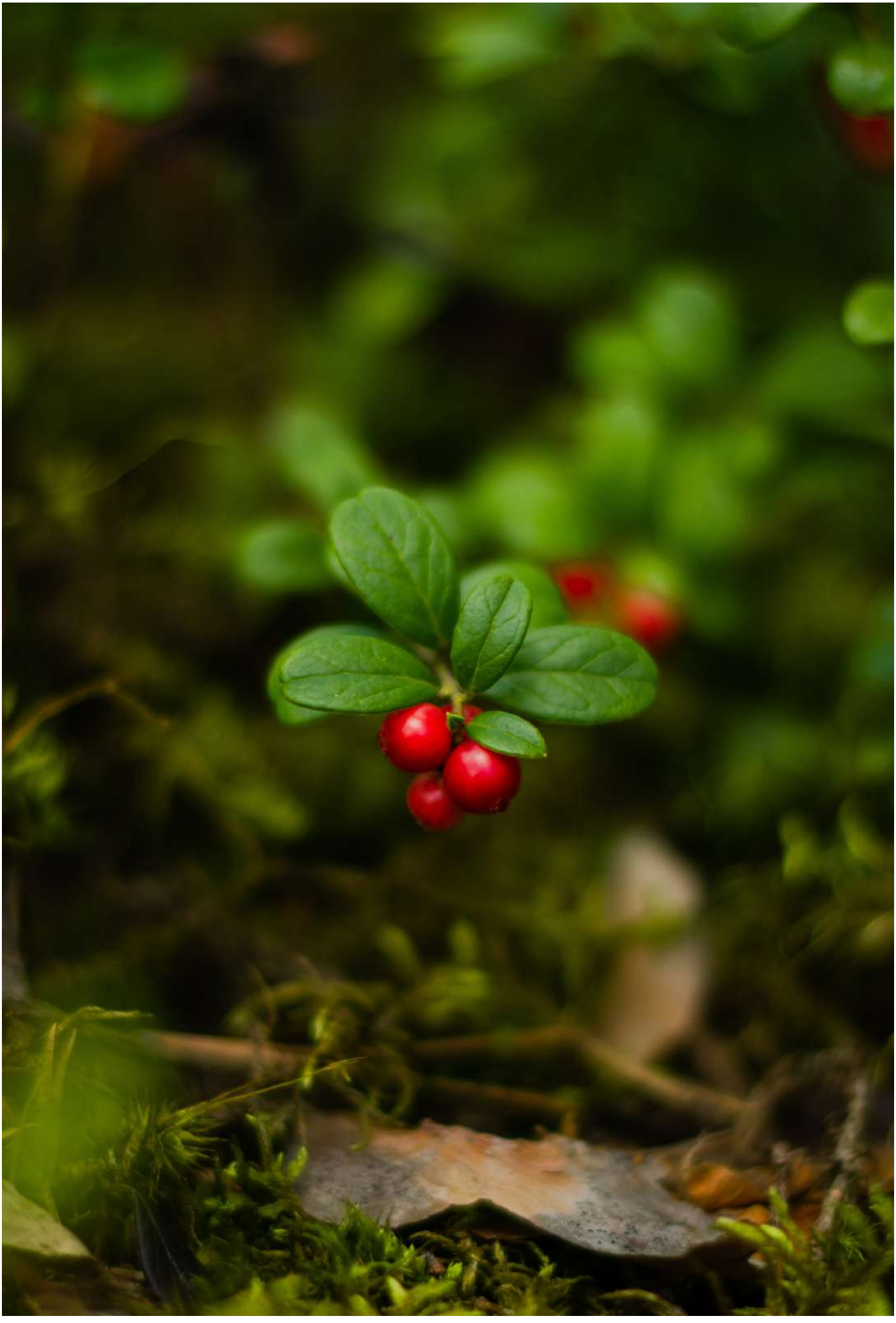
In the Global Biodiversity Intactness Index (BII), under the circular economy case, the value is expected to increase from the current value of 0.7900 to 0.7984 by 2050. In contrast, the business-as-usual case would lead to a decline in the BII to 0.7825 by 2050. These findings underscore the potential of the circular economy approach to facilitate the recovery of species populations to nearly 80 per cent of their pre-modern levels by 2050, surpassing the 78 per cent recovery anticipated under the business-as-usual case[31].

28 SITRA, 2022. Tackling root causes - Halting biodiversity loss through the circular economy.

29 A. Wijkman et al. 2015. The Circular Economy and Benefits for Society Swedish Case Study Shows Jobs and Climate as Clear Winners

30 International Resource Panel (2019). Global Resources Outlook 2019

31 SITRA, 2022. Tackling root causes - Halting biodiversity loss through the circular economy.



5. Examples of co-benefits of circular solutions in practice

In this report, we have discussed the value of lifting co-benefits in circularity. Nordic countries' many innovative businesses are a vast source of good examples. Below we have highlighted three examples from different sectors that we believe clearly show the potential in co-benefits.

Example 1. Fossil-free sponge iron with a circular solution

FerroSilva has developed a circular solution for fossil-free sponge iron production, an input to steel manufacturing. Their solution is to reduce the amount of energy going into manufacturing sponge iron by using forest residues (i.e. dried biomass), through a gasification process thereby reducing the amount of electricity to a tenth compared to traditional production. Through the process several industrial input products are generated and utilized including biochar, captured biogenic CO2, which in turn can be used for production of electro fuel. The life-cycle analysis for the process shows that per ton produced the net emissions are -845 CO2, meaning a negative

emission scenario. The trees absorb 1205 kg CO2 from the atmosphere, and the indirect and direct emissions from production is 360 kg CO2.

Cost estimations also show that this innovative process is more cost effective than other known production processes for fossil-free sponge iron in Europe.[32]

Example 2. Small scale advanced photovoltaic plant as a way of securing energy supply

The farm Kärrbo Prästgård, located in Västerås, Sweden, has recently developed a system for securing a fossil free energy supply by using a small scale advanced photovoltaic plant, where cattle is also grazing. Electricity is led to an electrolyzer, separating hydrogen and oxygen in water. The hydrogen is then collected in a tank and the oxygen is led to a fishpond. The heat produced in this process is then used for heating the farm's stables, diary, bakery, cider factory, for drying hay and warm tap water in residential buildings. The hydrogen can also be stored for winter or be used as fuel for cars and tractors or for electricity for housing and the electricity grid.

Thus, Kärrbo Prästgård is becoming both self-sufficient and an energy supplier to the society.[33]

32 Source: Metallerochgruvor.se (2023). Ny Teknik för energieffekiv tillverkning av fossilfritt stål: https://www.metallerochgruvor.se/20230505/9456/ny-teknik-energi effektiv-tillverkning-av-fossilfritt-stal (2023-11-27); Ferrosilva.com (2023)

33 Source: https://www.karrboprastgard.se/v%C3%A4tgas (2023)

Example 3. Recycling of indium in industry waste

Mat4GreenTech is a Swedish company based in Gothenburg specialized in Indium tin oxide (ITO) production and indium recycling. The company's in-house recycling solution recycles up to 95 per cent of their customers products leftovers and all products are made with zero CO2 emissions and with 100 per cent renewable energy. Indium, listed as a critical raw material by the EU Commission, is a key component in today's computers, smartphones, and solar cells, but there are few deposits globally. Although there is small scale mining of Indium within in the EU, the union is primarily an importer. The recycling of indium from industry waste within the union thus not only increases the EU's strategic autonomy but has many other clear benefits for the sustainable transition.[34]

34 Source: http://www.mat4greentech.com/environment/ (2023), https://www.svemin.se/svensk-gruvnaring/samhallets-behov-av-metaller/lista-over-kritiska-ravaror-2020/

6. Challenges

Circularity rates in the Nordics are nowhere near where they need to be in order to ensure sustainability. Today only 6 per cent of the Nordic economy is circular, meaning that 94 per cent of resources consumed in the economy are derived from virgin material resources. However, there is immense promise of the circular economy for the Nordic region although there are some challenges to overcome.

This report has highlighted the fact that there currently is an emphasis in studies and reports on economic and environmental co-benefits of circular economy as well as job creation – particularly when it comes to quantifiable impacts. However, while although job creation falls under the category of social benefits, there are other dimensions of social impact which have been less highlighted, and thus one of the challenges identified. As the Consumer Insight Action Panel points out, there are less studied social impacts of circularity[35]. While economic and environmental benefits are well-documented through quantitative analysis, there is a need for further research to comprehensively understand the social implications and potential

Thematic areas*	Labor Practices and Decent Work	Human Rights	Society	Product Responsibility
Social Aspects	1. Employment 2. Labor/Management Relations 3. Occupational Health and Safety 4. Training and Education 5. Diversity and Equal Opportunity 6. Fairdistribution of income 7. Quality and Well-being	8. Investment 9. Non-discrimination 10.Freedom of Association and Collection Bargaining 11.Child Labor 12.Forced or Compulsory Labor 13.Security Practices 14.Human Rights Mechanisms	15.Social inclusion (equity) 16.Social networks 17.Social cohesion 18.Participation and Local Democracy 19.Anti-corruption 20.Public Policy 21.Compliance 22.Supplier Assessment for Impacts on Society 23.Cultural Traditions 24.Tourism and Recreation 25.Local Communities (Sense of community and belongig)	26.Customer Health and Safety 27.Product and Service Labelling 28.Marketing Communications 29.Customer Privacy 30.Compliance 31.Anti-competitive behavior

Figure 1: Thematic areas and aspects for social dimension within CE defined by Padilla-Rivera et al. (2020)

35 Consumer Insight Action Panel (2022). Discussing the Social Impacts of Circularity. Available at: https://circulareconomy.europa.eu/platform/sites/default/files/ciap_social-impact_report.pdf

barriers. The table below lists some of the social impacts of circularity developed by Padilla-Rivera et al. (2020).

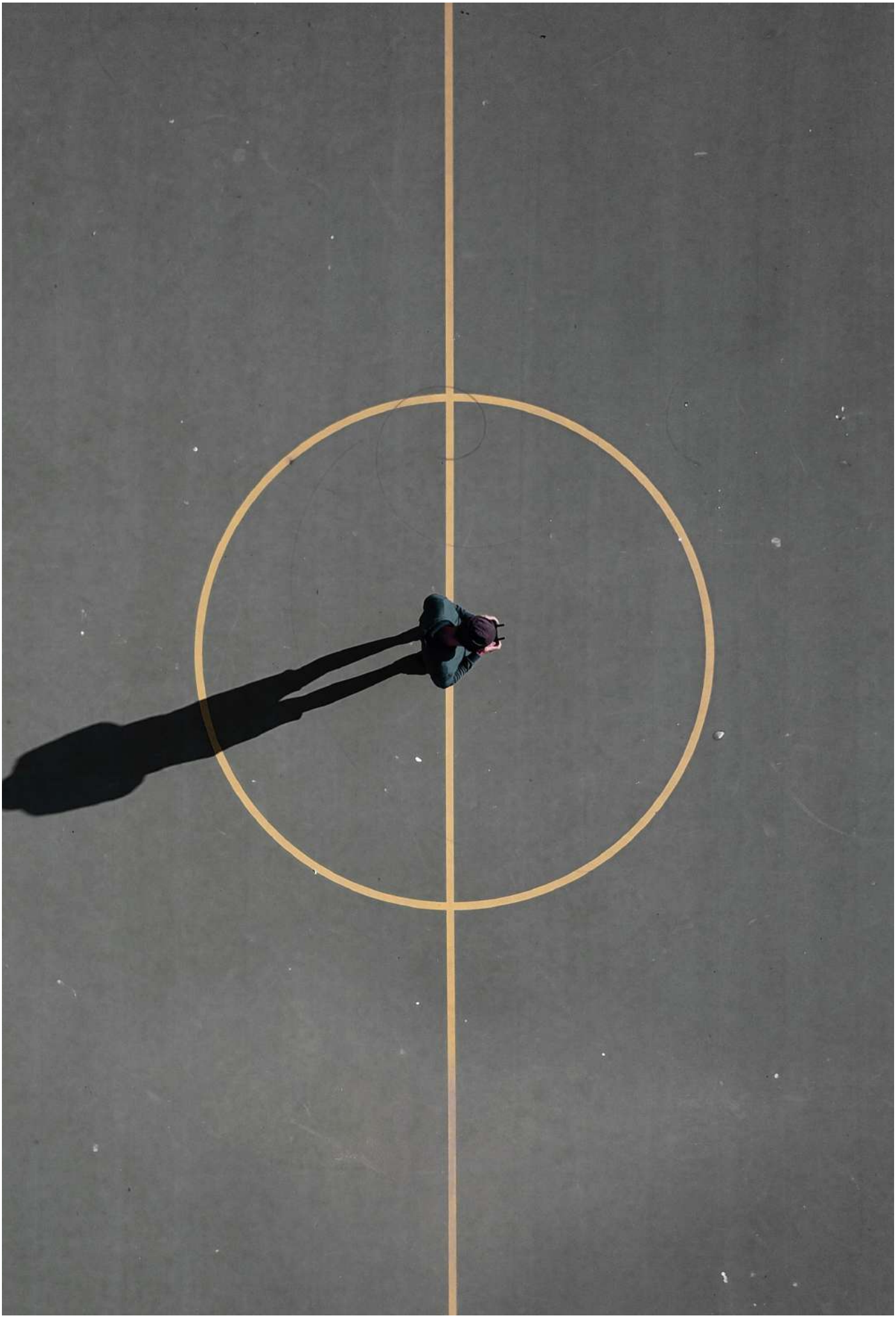
Broadening the scope of co-benefits beyond the usual suspects of economic, environmental and job creation impacts would further strengthen the case for circular economy and should be further explored. It could even better show how circular economy principles can interlink different sectors and value chains, offer growth opportunities which play an important role in business decision-making, contributions to climate and environment related targets (e.g. carbon emission reductions, halt biodiversity loss) while simultaneously generate positive impact for the society and peoples' well-being.

Another challenge is the gaps in availability of essential data and information. The transition to a circular economy requires systemic change across all sectors and is complex in terms of goals and stakeholders. Indicators and metrics are crucial to steer the transition, build cohesion, monitor progress, and evaluate the impact of circular economy interventions. For indicators to be successful in supporting stakeholders guiding the transition, they must be consistent, meaningful, widely accepted, and easy to understand.[36]

A Nordic Innovation report from 2021 found that the lack of data was one of the largest obstacles in searching and collating information on the supply of both virgin and secondary critical raw material in the Nordics[37]. The ability to identify the already existing supply would be essential for evaluating circular business opportunities for any material steam.

36 As the Consumer Insight Action Panel points out, there are less studied social impacts of circularity.

37 The Nordic Supply Potential of Critical Metals and Minerals for a Green Energy Transition [P. Eilu et al. (2021)], p. 75.



7. Recommendations

Our recommendations to policy makers underscore the importance of enabling businesses to tap into circular business opportunities, by strengthening the case for co-benefits of circular economy. A better understanding of the co-benefits of circularity is likely to raise awareness among policy makers to remove barriers, design policy instruments and foster collaboration on circular economy in the Nordics as well as help incentivize businesses to accelerate their ambition.

1. Support Nordic businesses to identify co-benefits of increasing circularity in their decision-making by creating a Nordic circular economy database

In order to identify the co-benefits of increasing circularity and be able to effectively use it in their decision-making, Nordic businesses will need reliable data built on well-designed indicators. To cater to this need, an open access, up to date, Nordic circular economy database should be established, identifying both primary and secondary resources as well as co-benefits. It can build on the already existing Eurostat database on circular economy as regards structure and cross-feeding data. Given the increasing interest for circular economy as a field of study, an important role for such a database would be to gather and harmonize analysis.

2. Incentivize sharing knowledge and data between stakeholders around identified co-benefits of circular economy in the Nordics and methods for quantifying them

Many businesses are likely to have valuable data about identified co-benefits connected to their area of business but may, for different reasons, be reluctant to share it publicly. For example, hesitancy towards sharing information without knowing how it will be used, or not having the right tools for quantifying data, could effectively hinder data sharing. As accurate and available

data is imperative in spreading information of co-benefits, measures should be taken by Nordic governments to understand the rationale behind data sharing obstacles. This should be combined with bringing forward possible solutions to increase the incentives, such as open-access platforms and carbon pricing to level out the field between virgin and recycled materials. Public actors should also take a key role in developing methods for data sharing, such as guidelines for data reference, at the same time taking into consideration the preconditions and modalities of different branches of industry.

3. Develop a practice of benchmarking public procurement processes against circular alternatives by considering co-benefits

Public procurement can be an important driver of market demand for circular solutions. The approximate annual spending on public procurement in the Nordic region is over 226 billion EUR[38]. Nordic business leaders have expressed the need for higher climate requirements in public procurement as a way to drive demand for sustainable products[39]. Using circularity in public procurement can generate multiple benefits such as maximizing value for money, optimising resource efficiency, supporting climate change targets, protecting biodiversity as well as promoting both innovation and circular jobs[40]. For examples, Finnish SITRA highlights the co-benefits from local municipalities leveraging circular principles in purchasing of catering services, where aspects such as nutrient cycling, agroecological symbioses and health of soil, can benefit the environment. Simultaneously promoting plant-based proteins can influence consumers dietary habits in a favourable way.

38 Nordregio (2022). The missing multiplier – How to use public procurement for more sustainable municipalities. Policy brief 2022:3. Available here: the-missing-multiplier.pdf (nordregio.org)

39 Haga Initiative (2021). Nordic CEOs' view of raised climate ambitions in the Nordic countries

40 Ellen McArthur Foundation (2023). The benefits of circular public procurement. Available at: https://emf.gitbook.io/circular-procurement-for-cities/the-benefits-of-circular-public-procurement (Accessed: 2023-11-29)

By also considering solutions to minimize food waste, both ecological and economic benefits can be reaped[41].

4. Designate a permanent coordinator to strengthen circular business solutions and promoting their co-benefits in Nordic countries

Nordic governments should designate a permanent coordinator responsible for bringing together different sectors for scaling up cluster collaborations around co-benefits of circular business solutions. The permanent coordinator should be especially tasked to find suitable areas for Nordic cooperation. The Swedish government's designation of a coordinator for the green transition of the business sector and transformation of society in the northern Sweden could serve as a model when designing the role and its mission.

41 SITRA (2019). Municipalities enable the important moves in the circular economy. Available at: https://www.sitra.fi/en/articles/municipalities-enable-important-moves-circular-economy/ (Accessed: 2023-11-29)

About this publication

Co-benefits of Circular Economy in the Nordics
- a great opportunity to gear up sustainable business models.

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