



Study for a National Strategy for Circular Economy

Short summary

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Foreword

The Government's goal is for "Norway to be a vanguard nation in the development of a green, circular economy focused on better utilisation of national resources". It has committed to preparing a national strategy for the circular economy.

Deloitte has accepted an assignment from the Ministry of Climate and Environment to complete a study on the Norwegian circular economy. Our mandate is to collate available information about the circular economy in Norway and identify gaps.

The study consists of three reports that examine industries and industry collaborations with the greatest potential for increased circularity (report 1), barriers preventing the realisation of this potential (report 2), and policy instruments necessary to reduce key barriers (report 3).

This study is based on input from a meeting with more than 50 key representatives from across 12 different industry groups, interest organisations and research communities; around 90 written statements, interviews, and a review of a broad selection of written sources, including the industries' own roadmaps for green competitiveness.¹

There is considerable potential for increased circularity in all the industries we have reviewed. Collaboration between industries, both within and across value chains, will be decisive in creating a circular economy. For example, a focus on complete circular value chains in the production of seaweed and kelp, as well as electric car batteries, will be necessary in enabling the value creation potential of

between NOK 40-50 billion in 2050 for each of these areas.²

Estimates indicate that the Norwegian economy is only 2,4 % circular, while the global economy is 9 % circular.³ The annual extraction of natural resources has tripled since 1970. In correlation with this, greenhouse gas emissions are rising and large parts of the world are facing considerable waste and pollution issues. The linear economy is a primary cause of the greatest environmental issues humanity is facing, and has contributed to the transgression of several Planetary Boundaries.

Increased circularity in the production of materials such as cement, steel, plastic, aluminium, and food could account for nearly half of the solution in achieving a zero-emission economy. A transition to renewable energy and more stringent energy efficiency measures make up the rest of the potential. In our work, we have included the transition to renewable energy as part of the shift to a circular economy. In the circular economy, all resource extraction will be minimised – whether this is for material use or energy purposes – and will take place in a manner which ensures equal access to resources and ecosystem services for future generations. This will be done through optimal utilisation of the resources already extracted, and by avoiding activities that generate pollution and emissions/discharges.

We believe it is important that the authorities develop a strategy where the circular economy can be understood as a holistic framework that will contribute toward solving all environmental problems, including the climate issue, and

which helps preserve a viable business sector. Use of resources within the Planetary Boundaries forms the basis for the EU's new action plan for the circular economy. The same should apply for Norway's upcoming strategy for the circular economy.

Norway is facing a challenging transition to a circular economy, but it is well-positioned for increased value creation and employment through its ample access to renewable natural resources and a highly-skilled business sector.

The transition to a circular economy is important in order to achieve the UN's Sustainable Development Goals and Norway's climate targets. According to a recent global analysis, Norway is one of the countries at greatest risk of a decline in GDP in a scenario where the world is not able to transition to a sustainable economy.⁴ At the same time, we are exposed to significant transition risks as our key export markets, such as EU, have ambitious plans to transition to a circular zero-emission economy. If the authorities and public and private sectors do not adequately prepare for the transition, Norway risks being left with stranded assets, and forfeiting a number of new value creation opportunities.

We hope this study will help shed light on key opportunities for Norway in a circular economy, and that the business sector seizes these opportunities to accelerate the transition. The authorities must do their part by forging a strategic direction for the Norwegian business sector in the circular economy, as well as introducing predictable frameworks and policy instruments necessary to realise this potential.

¹¹ All contributors and sources used in this study are listed in the respective reports that you can find on <https://www2.deloitte.com/no/no/pages/risk/articles/sirkulaer-okonomi.html>

² SINTEF (2019). *Nye muligheter for verdiskaping i Norge*. Rapport på oppdrag for NHO.

³³ Circle Economy & Circular Norway (2020) *The Circularity Gap Report Norway*; Circle Economy (2020) *Circular gap report 2020*.

⁴ WWF (2020) *Global Futures: Modelling the global economic impacts of environmental change to support policy-making*.

"In the circular economy, all resource extraction will be minimised and will take place in a manner which ensures equal access to resources and ecosystem services for future generations. This will be done through optimal utilisation of the resources already extracted, and by avoiding pollution and emissions/discharges."



1. Considerable potential for increased circularity within and across most industries in Norway

Based on a comprehensive assessment of the potential for increased circularity, and given the Norwegian industry structure and resource base, the following industries emerged with particular significance to this study; agriculture, forestry, aquaculture and fisheries, process industry, construction and real estate, and retail.

This selection covers industries from primary, secondary and tertiary industries, and accounts for 22 % of GDP. They represent industries at the forefront of the EU's action plan for the circular economy, and have either a direct or indirect impact on close to 50 % of waste streams in Norway.

A high number of competing factors and considerations makes it difficult to prioritise industries. Since the circular economy aims to solve virtually all environmental and resource problems, the transition will demand different changes across different industries. This means that there is not necessarily only one right answer to which industries or industry collaborations have the greatest potential, or which are most important. Achieving a transition to a circular economy will require multiple measures throughout the Norwegian economy.

Some of the industries play particularly important roles in triggering a potential for circularity in other industries. The waste management, sewage, and recycling industries play a key role in triggering the potential for a circular economy by facilitating higher levels of sorting, reuse and material recycling, and by offering secondary raw materials on the market. Electricity, gas, and district heating make up an important partner for most industries in the transition from fossil to renewable energy and fuel. Transport and distribution will be an important nexus in ensuring a good flow of raw materials and goods. Finally, all industries will have to demand more circular raw materials as input materials to create stable and profitable markets.

Major changes in both extraction and production processes, as well as consumption patterns, will require cooperation both within and across industries and value chains. For example, this could be related to mapping and accessing information about material and waste streams. There is a need for cooperation that facilitates local, regional, and circular solutions where one business' waste or surplus energy can be input factors for other businesses. Agriculture, forestry, aquaculture and fisheries, and the process and food industries have particularly high potential for fruitful cooperation.

At the business level, the transition to a circular economy will require more cooperation within value chains to make them more circular. In many instances, this will involve setting requirements for other parts of the value chain. For example, setting requirements concerning material use, function and purpose, energy use, and handling of products at the end of their lifetime.

Cooperation could also involve sharing experience from using technology that facilitates the sharing of products and resources, in addition to streamlining and optimising production processes. For example, the oil and gas sector has had successful experience with sharing platforms within the industry. The aquaculture industry has also made great strides in the use of sensor technology to monitor and optimise its production.

Norway has developed innovative and highly skilled industries associated with the extraction, processing, and production of products from our largest natural resources such as oil and gas, renewable power and aquaculture. Using experience and competence from such industries will be important enablers in supporting a successful transition to a circular economy in Norway.

A photograph of a forest path. The path is a narrow, light-colored trail that winds through a dense forest. The trees are tall and their leaves are a vibrant green, with some showing signs of autumn. Sunlight filters through the canopy, creating a dappled pattern of light and shadow on the path and the surrounding vegetation. The overall atmosphere is peaceful and natural.

2. Several cross-sectoral barriers prevent the transition to a circular economy

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Across the selected industries, we found the following cross-sectoral barriers either delaying or preventing the transition to a circular economy in Norway:

Regulatory / political barriers

- Lack of predictability for the business sector through long-term policy and framework conditions for a circular economy in Norway
- Lack of political objectives and coordination in public administration
- Current regulations are designed to regulate activities in a linear economy. There are unclear regulatory definitions of what constitutes a resource and what constitutes waste. Further, there are restrictions regarding which entities are allowed to utilise resources defined as waste.
- There are multiple instances where the accounting, taxation, and excise system favours "consumerism" rather than increased utilisation of existing resources.
- Lack of requirements to promote innovation and greater use of circular products or services in public tenders
- Lack of, or insufficiently ambitious, national and industry-specific requirements for material recycling

Economic barriers

- Markets do not fully price society's actual costs from environmental impact associated with extraction and processing of raw materials, production, consumption and disposal of products and structures
- Lack of risk capital prevents new and existing businesses from developing more circular business models
- Insufficient profitability in establishing infrastructure and systems for collection, sorting and material recycling
- Markets of insufficient size to utilise products consisting of secondary and circular materials

Technological barriers

- Digital immaturity in multiple industries
- Lack of digital infrastructure for resource optimisation
- Lack of technology and systems to handle and utilise secondary raw materials

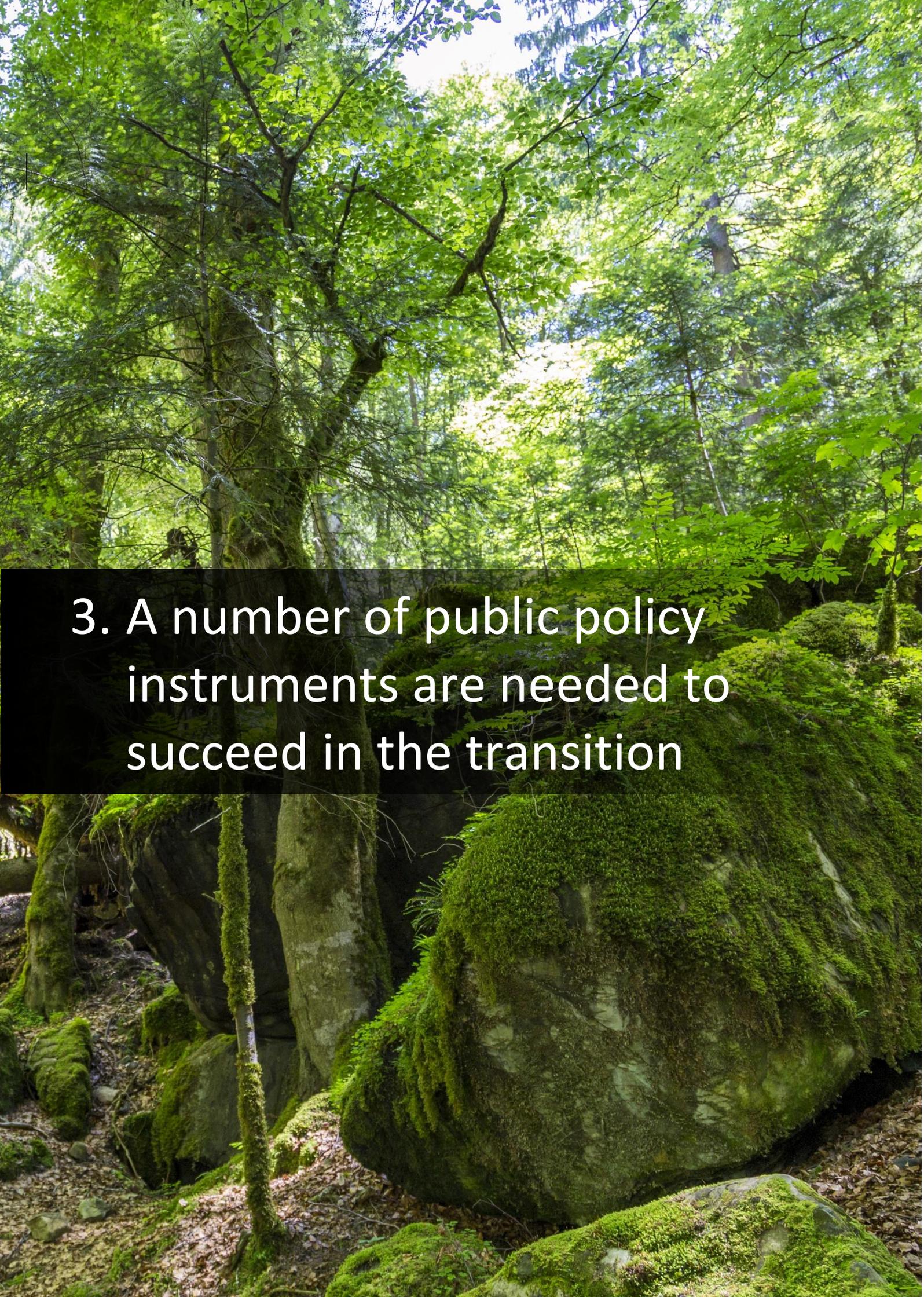
Structural barriers

- Lack of cooperation within and across industries, value chains and in public administration and public policy system
- A fragmented system for waste management leads to suboptimal solutions which pose a barrier for increased sorting, material recycling and profitability in the handling of multiple types of waste, such as plastic packaging

- Small volumes of material and waste streams, spread across large geographical areas
- Lack of or deficient data for material and waste streams (volumes, content and quality)

Knowledge and cultural barriers

- Lack of knowledge, awareness, and factual basis associated with the overall environmental footprint of input factors and products makes it difficult for businesses and consumers to find "good", circular options.
- Insufficient use of complete life cycle analyses to calculate the overall environmental impact of products and processes
- Lack of framework conditions for a long-term commitment to research and innovation on the circular economy that runs across industries and research communities
- General confusion surrounding the differences and similarities between terms such as circular economy, sustainability, climate-neutral, green growth and transition
- Established attitudes and habits frequently mean that businesses and consumers do not request, or prioritise more circular solutions

A photograph of a dense forest. The foreground is dominated by large, moss-covered rocks and tree trunks. The ground is covered in fallen leaves and more moss. The background is filled with tall trees with vibrant green foliage, with sunlight filtering through the canopy. A semi-transparent black box is overlaid on the middle of the image, containing white text.

3. A number of public policy instruments are needed to succeed in the transition

We have identified six main areas that should be prioritised in the Government's strategy for the circular economy in Norway. The policy instruments under these six areas will address the most important cross-sectoral barriers, and will help trigger a potential for increased circularity in most industries in Norway:

Set clear national goals and indicators:

Setting national goals and performance measures can give the business sector clear direction and enable more predictability of progress in the transition to a circular economy. Measurable indicators should also be established to make it possible to track these developments.

Establish markets for circular raw materials, products and services:

To correct market failures, policy instruments should be introduced to contribute to create well-functioning and stable markets for circular raw materials, products and services. These include:

- Higher environment taxes; for example, environmental taxes on primary raw materials, higher taxation of unsorted waste for combustion, and reduced VAT on circular services.
- Setting regulatory requirements; for example, requiring a certain percentage mix of secondary raw materials in products, or clear mandatory environmental requirements in the public procurement process. Regulatory barriers that reduce the demand and flow of circular raw materials, products, and services, must be removed.
- Strengthening business-oriented range of policy instruments; for example, increased support for the circular economy through the Pilot-E programme, and the Norwegian Innovation Clusters programme.

More and better Extended Producer Responsibility (EPR) schemes:

Additional EPR schemes should be established in order to hold manufacturers accountable and ensure that goods and products put on the market are circular. In addition, existing schemes should be reviewed. We propose:

- Expanding EPR to additional product categories.
- Closing gaps in existing EPR schemes.
- Introducing requirements and incentives for ecodesign and circularity in EPR schemes.
- Introducing mandatory necessary cost coverage for collection, handling and material recycling of waste streams covered by EPR.
- Establishing material registries in connection with all EPR schemes.

Clearer responsibilities and requirements for waste management:

There is a need for a more harmonized and optimized system for collecting and handling waste in Norway. This will contribute to increased cost efficiency and profitability, and a more stable supply of secondary raw materials of good quality in the market. We propose:

- Establishing a national plan for waste sorting, treatment and material recycling in Norway.
- Harmonised requirements for separate collection of recyclable waste vis-à-vis both municipalities and the business sector.
- Higher goals and requirements for material recycling

Building a data-driven digital circular economy:

Improving the overall data associated with the material and waste streams, as well as digital solutions that can access and harness this data, are prerequisites

for the transition to a circular economy. A collaborative project should be established between the authorities and industries to develop a data-driven circular economy. Pilot projects in select industries and value chains should aim to:

- Obtain an overview of the need for more and better data associated with key material and waste streams.
- Establish a data governance model and architecture for data sharing in a circular economy.
- Review existing material and waste statistics and rectify significant deficiencies.

Raising knowledge and awareness about the circular economy:

In order to support the development toward a true circular economy, increased knowledge and competencies among all stakeholders from government, industry, and the end consumer is crucial. The following are considered particularly important in this effort:

- Increasing the business sector's knowledge about the circular economy.
- Skills development in the municipal sector, county council and among public procurers.
- Increasing consumers' knowledge about the environmental footprint of materials and products through increased use of fewer, standardised labelling systems.
- Increased emphasis on system perspectives, circular economy, and critical environmental challenges in primary and lower secondary school.



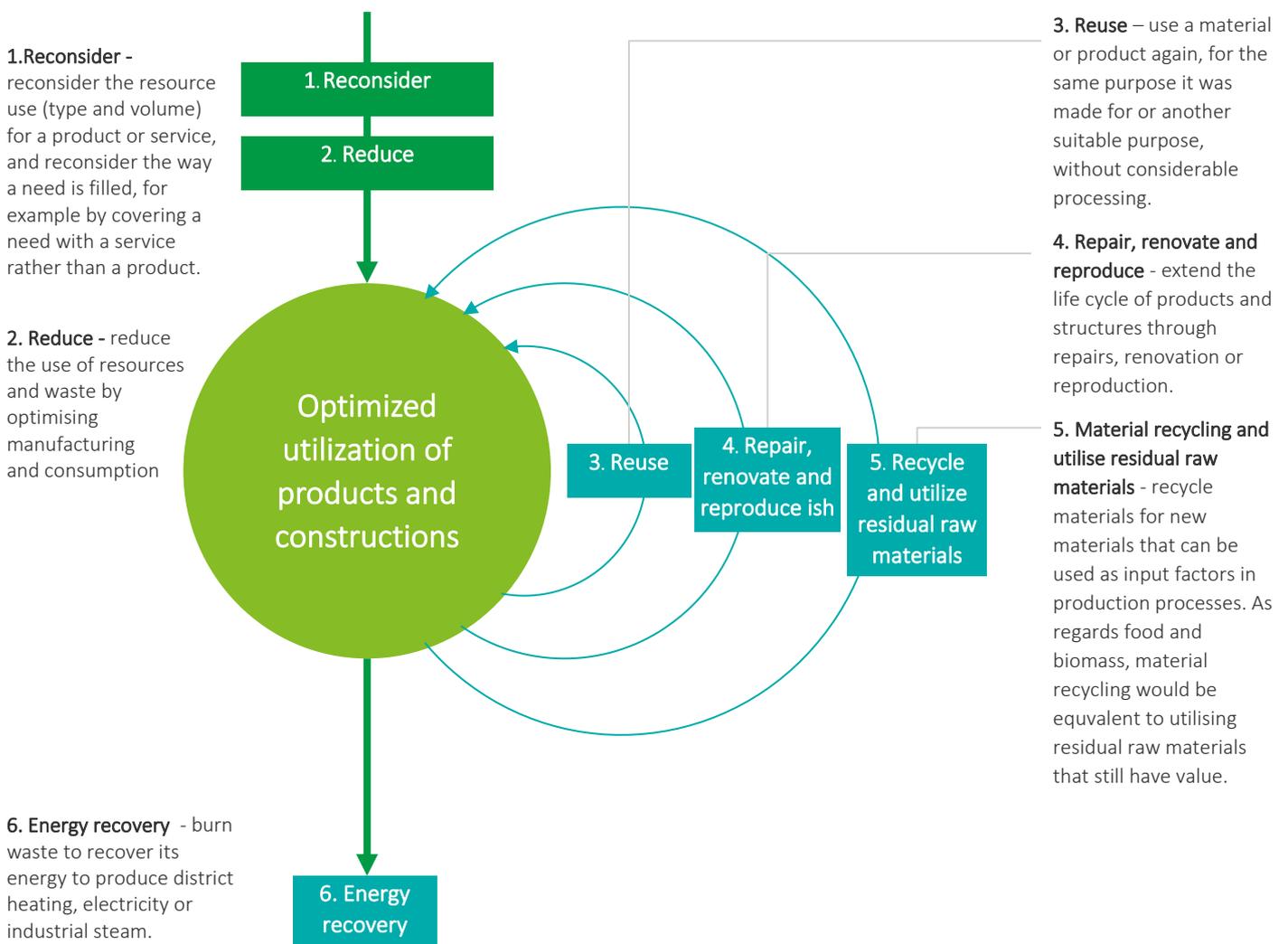
Basic principles and strategies for a circular economy

Below we will outline six strategies that are important for the transition to a circular economy. The strategies represent different ways to reduce resource needs and waste. The most effective strategies are presented first in the figure. The authorities and the business sector should therefore start by examining their potential for change in connection with the first strategies before considering the potential associated with the next strategies.

The strategies in the figure share certain similarities with the waste hierarchy, which forms the basis for prioritising measures in waste policy in Norway and the EU. In line with the principles in the waste hierarchy, the most impactful measures for a circular economy are preventing consumption and waste, then facilitating the longest possible product life cycles through reuse, repairs, renovation and reproduction. When the products can no longer be

reused, repaired or renovated, material recycling should be prioritised over energy recovery. The last instance for waste management is final processing in the form of land fill⁵. Land fill is not considered a circular strategy, but land fill and energy recovery could be the most prudent strategies to handle certain kinds of hazardous waste.

Figure 2: Six strategies for a more circular economy.



⁵ Sortere.no (no date). [Avfalls- og gjenvinningsbransjen i Norge](#) (Waste and recycling industry in Norway). Accessed: 04.04.20.

Sustainable use of biomass in the circular economy

Biomass and land area are already scarce resources and will be in increasing demand in a circular zero-emission economy. This is because carbon from renewable sources such as trees is a good replacement for fossil resources, both for fuel and as raw material in the production of various products.

However, the production of biomass must take place within the framework of sustainable use of land area. This means that considerations are taken for biodiversity, food production and carbon storage. In order to ensure this, it is important to reconsider and prioritise the use of land area and biomass in a future Norwegian circular economy. Klimakur 2030 (Climate Cure 2030) summarises a few key principles for such prioritisations based on recommendations from the Intergovernmental Panel on Climate Change (IPCC):

- Measures that reduce the need to use biomass and land area are prioritised over measures that increase such use
- Increased production of biomass and CO₂ uptake in soil and biomass on land areas are prioritised
- Biomass should preferably be used to produce high-grade products with a long life cycle, while waste and residuals from production should be used for bioenergy
- Bioenergy is paired with carbon capture and storage (CCS) to achieve negative emissions

Equivalent prioritisations will be relevant for the circular economy.

Source: Norwegian Environment Agency (2020). [Klimakur 2030 \(Climate Cure 2030\)](#). Report M-1625.



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