

**FRAMEWORK TO ACCELERATE BUSINESS TRNASITON TO GREEN GROWTH
AND CIRCULAR ECONOMY IN KENYA**

BY

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Executive Summary

The concept of circular economy is emerging as a new growth paradigm shift around the world for the adoption of regenerative and restorative economies. Circular economies are founded on the principle that existing economic systems can be restructured in such to unleashing additional economic growth from within. Existing linear systems are resource intensive, wasteful, and contains systemic inefficiencies which drive up resource costs and underutilizes the invested resources. The circular economy creates additional growth compared to the, “**business-as-usual**” scenario by designing systems and products that require fewer resources in the first place, by making sure that products and services are used much more efficiently than it is done today, and by ensuring that extracted raw materials are used as many times as is practically possible. This way, the circular economy looks beyond the current, “**take-make-and-dispose**” extractive industrial model towards the, “**make-use-and-return**” model, with a focus on creating positive society-wide benefits through cross-industry partnerships, innovation in new products and new business models. The concept of the circular economy is embraced for its potential to create jobs and future-proof economic growth, increase private sector investments and profits, improve the standards of living, and decrease the negative impacts on the environment, nature, and climate.

New developments in the green and circular economy space are causing the shift for Kenyan businesses to rethink the way they consume and do businesses. The shift though has been slow hence the need to develop a framework to guide business in Kenya on models to adopt in order to tap into the opportunities presented by green and circular economy.

Market conditions that fail to account for negative externalities constitute a form of subsidy. Under-pricing of scarce resources can result in inefficient utilization of natural resources. Fiscal policies (taxes, tariffs and harmful subsidy removal) can discourage undesired social or environmental impacts while also creating revenue streams that can be used to encourage the development in the green direction.

Kenyan businesses are yet to fully conform to the CE principles of embracing green technologies while focusing on the responsible use of natural resources; circulating resources at their highest utility; maximizing the utilization rate of assets; as well as minimizing and gradually phasing out negative externalities.

The framework to accelerate transition to green and circular economy can be realized through the actualization of circular economy business models in form of regeneration, sharing, optimization, closing of material loops, virtualization, and exchange. Generally, there is limited adoption of innovative product designs (green designs, design for durability, design for reverse cycles); reverse cycles (repairing, reusing, refurbishing, remanufacturing, recycling); greening of internal operations; supplier engagement; internal company buy-in alignment, and external business collaborations.

CHAPTER ONE: INTRODUCTION

1.1. Green and Circular Economy

A green economy acknowledges the limited substitutionally of natural capital and employs the precautionary principles to avoid degradation, loss of critical natural capital and overstretching of ecological limits. A green economy is geared towards supporting sustainable consumption and production patterns for sustainable management of natural systems as informed by properties such as circularity. An inclusive green and sustainable economy looks at the long-term perspectives of the economy, is low carbon, resource conserving, diverse and circular. It recognizes the need for significant shift to limit consumption of natural resources' to physically sustainable levels if we are to remain within planetary boundaries.

There is an urgent need for an alternative economic model of development that centers on sustainability principles of 'greening' of the economy, in which greater development focus is placed on sustainable development pillars, promotes investments in renewable energy, embraces resource efficiency, public transportation, sustainable agriculture, ecosystem and biodiversity protection, land and water conservation, and "material wealth is not delivered at the expense of growing environmental risks, ecological scarcities and social disparities"¹. Green economies are likely to be more resilient, particularly in the face of environmental pressures, such as climate change. The consideration of environmental externalities should also be included within this greening of the economy. Environmental externalities are often unaccounted - and uncompensated-for by-products or side effects of production and consumption. However, such externalities do have significant costs associated to them, and valuing them as part of a green economy approach allows a better understanding and management of factors like water use, greenhouse gas emissions and pollution (UNEP, 2011).

The four types of capital namely manufactured, financial, social, and human are underpinned by natural capital – the stocks of Earth's natural assets and resources, including soil, water, air and biodiversity. The assets and resources of natural capital can be further defined as stocks of natural resources, such as deposits of fossil fuels, minerals and aggregates, and stocks of 'ecosystem assets', which are cycled and renewed as part of wider ecosystem functions. These stocks of natural capital provide humans with a flow of goods and benefits that positively impact our well-being. In this regard, biodiversity plays an important role in maintaining the flow of ecosystem services during times of disturbance or stress that ecosystems may experience (UNEP, 2011). Staying within ecological limits is a fundamental premise of a green economy.

Market conditions that fail to account for negative externalities and underpricing of scarce resources can result in inefficient utilization of natural resources. Fiscal policies (taxes, tariffs and harmful subsidy removal) can discourage desired social or environmental impact too. Degradation of natural capital over time represents a massive and often irreversible loss that is seldom accounted for in the country's national accounting systems.

¹ UNEP. (2011). Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication.

A linear economy is characterized by unsustainable use and pricing of natural resources based on a, “take-make-waste” model, where raw materials and natural assets’ are used to make products that ultimately end up in landfills and oceans or otherwise wasted (Singer, 2017). Therefore, a linear economy is inherently inefficient as it fails to maximize the value and utility of materials, products, and services (Singer, 2017). A circular economy, on the other hand, at its most simple level aims to decouple growth from the use of limited resources (Singer, 2017) Figure 1.



Figure 1: Linear Versus Circular Economy
Source: Ellen McArthur Foundation, 2015

Circular economy is a framework for an economy that is restorative and regenerative by design. It outlasts waste and pollution, keeps products and materials in use and regenerates natural systems. The ‘transition to a more circular economy, where the value of products, materials and resources is maintained in the economy for as long as possible, and the generation of waste minimized, is an essential contribution to any country’s efforts to develop a sustainable, low-carbon, resource efficient and competitive economy². Circularity explores opportunities to promote closed material loops and resource efficiency chains with a system-wide approach and across the entire value chain (EC, 2015). It implies designing products for reuse, using products for as long as possible, re-manufacturing products at the end of their service life; and in essence avoiding waste by design in production and supply (EC, 2015).

The most crucial aspect in green economy is the need for more rational and sustainable management of natural resources, which are increasingly under pressure due to the growing population, rising demand for raw materials, and increasing social inequality even within the less wealthy nations. This requires a two-prong approach. Upstream, meaning managing resources more efficiently, increasing productivity in production and consumption processes, reducing waste, while keeping the value of products and materials as much as practically possible. Downstream, making it necessary that everything which has a residual utility is not disposed of

²European Commission (EC), 2015. ‘Closing the loop — An EU action plan for the Circular Economy’, 2015

into the landfill but, recovered and reintroduced back into the economic system. These two aspects are the essence of the circular economy, which aims through technological innovation and better management to make economic activities more efficient and lower their impacts on the environment.

Creating Value in the Circular Economy

According to the Ellen MacArthur Foundation EMF (2014), specific circular processes have various economic yields according to different combinations of products, components and materials. However, the EMF points out four basic principles of value creation in CE:

‘The power of the inner circle’: a shorter/tighter loop usually results in more savings and potential benefits because inherent costs such as labour and energy are less. Thus, more value is retained in the final product because the savings and possible benefits are more abundant than goods produced in longer loops. As an example, a product retains more value after repair and maintenance than by recycling some of its components.

‘The power of circling longer’: value is created by the frequency a product (re) enters a cycle and the length for which it is used.

‘The power of cascaded use and inbound material/product substitution’: a cascade loop is created when a product or more often a component is used across different product categories, as for example cotton that may be used in a first loop for clothing, then for furniture filling, and ultimately for insulating. Value is created by the difference between the cost (including the embedded costs) of a virgin material, and the marginal costs of the material that is brought back into a loop for repurposing.

‘The power of pure cycles’: this value creation principle is mobilized if the end of life of a product has been considered at the design phase by ensuring, for example, that the product is easy to take apart and/or is made of non-toxic materials.

1.2. Goals of Green and Circular Economy Acceleration

The overall goal of green and circular economy acceleration is to enable Kenyan businesses to speedily embrace green technologies while focusing on the responsible use of natural resource inputs; maximize utilization rates of raw material inputs; circulate goods, product components and materials at the highest utility; embrace resource efficient cleaner production (RECP); and minimize and gradually phase out negative externalities. All this will be done to help assure an accelerated green and circular transition.

The specific objectives are:

- a. To minimize the environmental impacts of Kenyan business operations on natural ecosystems through **regeneration** efforts that include switching to renewable energy to power the company's operations, sourcing of bio-based materials, and phasing out of toxic production inputs;
- b. To maximize product usage through **sharing platforms** and servitization business models through strengthened repair and reuse of crucial materials, as well as finding new markets for unsold by-product and waste inventories;
- c. To optimize business environmental performance by increasing the environmental performance of business operations, supporting suppliers diminish their environmental impacts, reducing the amount of waste produced in the entire value chain, finding a second life for the waste produced in the value chain as well as adopting resource efficient cleaner production (RECP) with emphasis on energy efficiency, water use efficiency, waste minimization and management together with the adoption of supportive emerging technologies supported by internet of things (IoT), sensor and digital solutions and big data;
- d. To keep products, components, and materials within the production system for as long as possible through closed-loop approaches that include establishment of reverse cycles for company products at the end of their life, implementation of re-manufacturing, refurbishment, and recycling processes, harnessing the anaerobic digestion processes, and finding circular economy solutions for the company's water, energy, and materials demand;
- e. To prioritize circularity exchanges among firms by embracing green technologies that replace outdated materials and machines while offering innovative environmentally friendly solutions;
- f. To promote the accelerated uptake of innovative product designs by Kenyan businesses through technically assisted adoption of green designs, design for durability, as well as design for reverse cycles;
- g. To advance the reverse cycles culture among Kenyan businesses by enabling them to collect their used products for re-processing into high upcycled products through (sustained repair, reuse, refurbishment, re-manufacturing, and recycling);
- h. To establish effective customer engagement programs that will aid take-back-schemes through tailored educational activities, inspirational green marketing campaigns, as well as use of customer incentives;
- i. To promote company-wide green and circular economy practices through enhanced buy-in from top company executives and key stakeholders, on boarding company managers and employees, and ensuring strong cross-departmental alignments; and
- j. To strengthen external green collaboration with industry partner associations, NGOs and not-for-profit organizations, policy makers, research institutes and universities, as well as specialized niche institutions in accelerating the uptake of green and circular economy practices.

1.3. Circular Economy Guiding Principles

The CE has at its core, a model (Figure 1) where products, components, energy, and materials continually flow re-entering the production cycle thereby minimizing the impact of the firm's

operations on the environment (Tonelli & Cristoni, 2019). This is guided by the following practical principles:

- **Embrace green technologies** and focus on a responsible use of natural inputs. This principle concentrates on the company's inputs: the energy it uses to feed its machineries, offices, etc., and the raw materials sourced to manufacture goods and provide services. When entering a CE, businesses are encouraged to switch to renewable energy sources (solar, wind, composting, anaerobic digestion, etc.) while also reducing to a minimum the need for virgin raw materials.
- **Maximize utilization rate of assets.** The focus here is on product's usage: once in the market, assets need to be exploited fully by maximizing their utilization rates. This requirement can be achieved through innovative solutions linked to asset sharing and servitization.
- **Circulate goods, product components, and materials at the highest utility.** The emphasis is on the company's capabilities to set up circular flows of materials and products. Today, recycling and upcycling is the primary way for materials to re-enter production loops. However, re-use, repair, re-manufacturing, and refurbishment are more effective methods for keeping the value of products at their highest utility during every stage of the life cycle.
- **Minimize and gradually phase out negative externalities.** This last principle builds on the efforts of thoroughly applying the previous three to gradually achieve zero negative environmental externalities (e.g. water and air pollution, soil degradation, release of chemicals and toxins, etc.).

1.4. Benefits of Embracing Circularity

Figure 2 shows the seven benefits of embracing a circular economy development pathway.



Figure 2: The Benefits of Embracing Circularity

Source: PACE, 2017

- *Entering new markets or increasing market share*

Circular business models emphasize the need to maintain original product function as much as possible. Remanufacturing, refurbishment, and recycling extend the product lifecycle and provide an alternative to new products for customers, potentially expanding the range of customer segments able to access the product and/or the service it provides. Circular business models can also expand markets by sparking innovation in the way businesses meet customer demand. This can change how products are designed. For example, as-a-service models can both grow the use of remanufactured equipment and stimulate changes in product design by putting manufacturers in the role of owner instead of seller (PACE, 2019). Companies are using circular approaches to differentiate themselves from their competition based on price, quality, durability or convenience. These strategies allow businesses to improve their competitive advantage by capturing more market share, expanding into new markets, securing niche markets or being the first mover (WBCSD, 2020).

- ***Reducing costs and creating additional income***

Emphasis on reusing products, components and materials through producer-managed closed-loop programs contributes directly to bottom-line performance (PACE, 2019). Companies can generate revenue from existing products by taking a circular economy perspective on their products, services and operations. Specifically, businesses have demonstrated positive contributions to their bottom line by remanufacturing, refurbishing and turning products into services³. Companies can maximize value from their manufactured capital by collecting used equipment's from the market, remanufacturing them and re-selling them with the same high-quality guarantee as original products (WBCSD, 2020).

- ***Reducing risks and future-proofing of the business***

Reduced need for virgin materials and resources will result in less supplier dependency and a reduced risk of rising and volatile prices for materials used in products. Treating existing products and components as an alternate source of supply can also moderate risks and the associated costs arising from supply chain disruptions and long lead times. Being prepared for future customer demand for circular products and services will also increase the chances of winning business (PACE, 2019). Companies can insulate themselves against linear risks by purchasing circular supplies, recovering resources at end of life or partnering with the public sector. As issues like resource scarcity, pollution and commodity price volatility become increasingly material to business, leadership has an opportunity to address these challenges through the circular economy (WBCSD, 2020).

- ***Triggering innovation capacity***

By specifically focusing on driving value through circular business models (e.g., increased reuse of materials, repair/ refurbishment opportunities, feedback loops, and

³ WBCSD, 2020. 8 Business Cases for the Circular Economy

value retention), companies and their partners can trigger creative new ideas on how to design products and/or business models (PACE, 2019).

- ***Attracting and retaining talent***

A strong circular economy program helps companies to attract and retain talent, inspiring employees to work for a company across roles and departments with a sense of purpose. Research consistently shows that younger talent in particular considers purpose-driven companies with sustainability initiatives to be more attractive places to work and they are therefore less likely to leave (PACE, 2019).

- ***Delivering greater customer value***

- Greater circularity can build a strong relationship with customers. Solutions that extend lifecycles while providing upgrades help customers avoid disruptions. Managing the customer relationship throughout the full lifecycle also builds trust: strong take-back programs offer greater security and peace of mind at equipment end-of-life. As the partnership and the trust grow, it will also open up more opportunities to collaborate and drive mutually beneficial outcomes over the long term (PACE, 2019).

- ***Aligning with public expectations***

Businesses are facing increasing expectations from the public in respect of environmental impacts. Adopting sustainable circular economy strategies and practices provides a business-driven mechanism for reducing the use of natural resources (e.g. virgin materials, energy) and for increasing the use of renewable inputs (e.g. renewable energy, recycled materials). Such practices likely also contribute to mitigating climate change by reducing carbon emissions, whether operationally or in product use (PACE, 2019).

- ***Global Trends for Green and Circular Models***

Importance of the circular economy (CE) is growing due to unresolved global challenges, such as climate change and resource scarcity (EIT, 2020). The CE is an economic system that creates value by catching and reusing limited raw materials and energy resources by slowing, narrowing and closing their loops (EIT, 2020). It is expected to provide major business benefits in terms of improved resource use efficiency, reduced extraction, reduced processing, and avoided disposal of scarce natural resources⁴. Despite its proven potential benefits, the process of transitioning towards a CE has been rather slow in Kenya.

⁴ European Environment Agency (2019) Sustainability transitions : policy and practice

CHAPTER TWO: GLOBAL AND NATIONAL PERSPECTIVES' AND ROLE OF PRIVATE SECTOR IN ACCELERATION TRANSITION TO A GREEN AND CIRCULAR ECONOMY

2. Global Trends in Accelerating Green and Circular Economy

2.1. Global Outlook

The global economy circularity rate fell from 9.1% in the year 2018 to 8.8% in 2020. The global economy is consuming 100 billion of materials each year. Of all the minerals, fossil fuels, metals and biomass that enter the world economy annually, only 8.6% is cycled back. Circularity is stuck in reverse as driven by high rates of extraction, ongoing stock build up, low levels of end of use processing and cycling (Circularity Gap Report, 2020)

The European Union is implementing a Green Deal that has a detailed circular economy action plan that will enable the continent achieve a cleaner and more competitive Europe. The action plan is guided by the European Green Deal strategy that strives to make Europe climate-neutral, resource-efficient and with a very competitive economy⁵. Scaling up the circular economy from front-runners to the mainstream economic players will make a decisive contribution to the continent's achievement of climate neutrality by 2050 and decouple economic growth from resource use, while ensuring the long-term competitiveness of the EU and leaving no one behind.

To fulfil this ambition, the EU needs to accelerate the transition towards a regenerative growth model that gives back to the planet more than it takes from it, strives to keep its resource consumption within planetary boundaries, and strives to reduce its consumption footprint and eventually double its circular material use rate in the coming decade. For business, working together on creating the framework for sustainable products will provide new opportunities in the EU and beyond.

This progressive, yet irreversible transition to a sustainable economic system is an indispensable part of the new EU industrial strategy. Studies estimate that applying the circular economy principles across the EU economy has the potential to increase EU GDP by an additional 0.5% by 2030 while creating around 700 000 new jobs⁶. Innovative models based on a closer relationship with customers, mass customization, the sharing and collaborative economy, and powered by digital technologies, such as the internet of things, big data, blockchain and artificial intelligence, will not only accelerate circularity but also the dematerialization of the EU economy and make Europe less dependent on primary materials.

For citizens, the circular economy will provide high quality, functional and safe products, which are efficient and affordable, last longer and are designed for reuse, repair, and high-quality recycling. A whole new range of sustainable services, product-as-service models and digital solutions will bring about a better quality of life, innovative jobs and upgraded knowledge and

⁵ EU 2020. The EU Green Deal: Circular Economy Action Plan for a Cleaner and more Competitive Europe

⁶ Cambridge Econometrics, Trinomics, and ICF (2018), Impacts of circular economy policies on the labour market

skills. The Circular Economy Action Plan provides a future-oriented agenda for achieving a cleaner and more competitive Europe in co-creation with economic actors, consumers, citizens and civil society organizations. It aims at accelerating the transformational change required by the European Green Deal, while building on circular economy actions implemented since 2015. This plan will ensure that the regulatory framework is streamlined and made fit for a sustainable future, that the new opportunities from the transition are maximized, while minimizing the burden on people and businesses.

The plan seeks to create a set of interrelated initiatives designed to establish a strong and coherent product policy framework that will make sustainable products, services and business models the norm and transform consumption patterns so that no waste is produced in the first place. Further measures will be put in place to reduce waste and ensure that the EU has a well-functioning internal market for high quality secondary raw materials. The capacity of the EU to take responsibility for its waste will be also strengthened. The EU will continue to lead the way to a circular economy at the global level and use its influence, expertise and financial resources to help implement the 2030 Sustainable Development Goals. This plan aims also at ensuring that the circular economy works for people, regions and cities, fully contributes to climate neutrality and harnesses the potential of research, innovation and digitalization.

The following actions have helped the EU successfully embrace the circular Economy (EU, 2017):

- Reducing the quantity of materials required to deliver a particular service (light weighting)
- Lengthening products' useful life (durability)
- Reducing the wasteful use of energy and materials in production and use phases (resource use efficiency)
- Reducing the use of materials that are hazardous or difficult to recycle in products and production processes (substitution)
- Creating markets for secondary raw materials (recyclables) materials (based on standards, green public procurement, etc.)
- Designing products that are easier to maintain, repair, upgrade, remanufacture or recycle (eco-design)
- Developing the necessary services for consumers in this regard (maintenance/ repair services, etc.)
- Incentivizing and supporting waste reduction and high-quality separation by consumers
- Incentivizing separation collection systems that minimize the costs of recycling and reuse
- Facilitating the clustering of activities to prevent by-products from becoming wastes (by-product exchange through industrial symbiosis)

In Denmark, circular economy is all about making growth more sustainable. It means using their natural resources and designing their products in a way that extracted raw materials are used as sensibly and as many times as possible⁷. They should not end up in a dump, but in a new product. The Danish policy makers believe that the transition to a more circular economy holds major potential, not only for the environment, but also for the competitiveness of Danish enterprises. By using less materials and increasing recycling rates, enterprises can get more value out of less. Some of the Danish Government's Initiative Strategies for a Circular Economy that provide useful insights for Kenya includes:

- a. Promoting circular business development in SMEs
- b. Setting up a single point of entry to the authorities for enterprises with circular business models
- c. Expanding the access to financing of circular business models
- d. Supporting digital circular options by commercial use of data and challenges
- e. Incorporating circular economy into product policy
- f. Boosting Danish participation in European work on circular standards
- g. Promoting circular procurement
- h. Increasing focus on total cost of ownership in public procurement
- i. Promoting more harmonized collection of household waste
- j. Creating a level playing field on the market for waste and recycled raw materials
- k. Liberalizing WEEE management
- l. Establishing a fund for the handling of regulatory barriers to circular economy
- m. Developing a voluntary sustainability class
- n. Propagating selective demolition
- o. Getting more value out of biomass

Although Denmark is internationally recognized for innovative initiatives in circular economy and sustainability, the pilot study executed by the Ellen MacArthur Foundation identified significant opportunities for furthering the transition towards a circular economy⁸.

Modelling conducted in this study suggests that by 2035 it could lead to an increase in GDP by 0.8–1.4%, the creation of an additional 7,000–13,000 job equivalents, a 3–7% reduction in carbon footprint, 5–50% reduction in virgin resource consumption for selected materials and an increase in net exports by 3–6 % (Ellen MacArthur Foundation, 2015). Ten circular economy opportunities were identified in five focus sectors, and the largest economic potential was found in Construction & Real Estate and in Food & Beverage.

Greening Supply Chains in the USA

⁷ Ministry of Environment and Food and Ministry of Industry, Business and Financial Affairs, 2018. The Danish Government Strategy for Circular Economy: More value and better environment through design, consumption, and recycling

⁸ Ellen MacArthur Foundation, 2015. Delivering the Circular Economy – A Toolkit for Policymakers: Denmark Case Study

The US Department of Commerce, along with the US Environmental Protection Agency have produced a joint venture known as the Green Suppliers Network⁹. This is a promising incentive, which targets small to medium businesses and seeks to improve the sustainability of their manufacturing processes through changing behaviour rather than large capital investment. Large manufacturers join the program and in turn nominate small to medium suppliers in their supply chain. If these manufacturers choose to join the programme, a local Green Supply Chain (GSC) Review team will help conduct an on site 'lean and clean assessment' to help determine how the company can improve on its efficiency and manufacture in cleaner ways, in particular how to make full use of raw materials, conserve water, increase energy efficiency and eliminate toxic materials. Importantly, the programme aims to train employees to identify environmental opportunities within the manufacturing process. The principal incentive behind the programme is the all-round benefits it provides. For the small/medium manufacturer costs are reduced and their competitiveness in the market increased.

From Export Oriented Policies to the Participatory Guarantee System in India

In 2000, the Indian Ministry of Commerce established the National Steering Committee for Organic Production (NSCOP), to promote organic products for the export market. Both the US and EU have since recognized Indian organic standards as equivalent to their own through mutual recognition. To facilitate the transition from conventional to organic farming, the government provides financial support for a period of conversion of 3 years, with the possibility of extension. This amounts to approximately US\$228 per hectare. In terms of institutional capacity building, the Indian government has been promoting organic agriculture through training programmes for producers and certification agencies, as well as setting up research institutions aimed at improving organic production and developing logistics infrastructure. An accreditation policy was approved in 2001, which set up a number of accreditation agencies. As of March 2006, the US Department of Agriculture recognized India's organic certification as equivalent to its own, such that the Indian accreditation bodies are now eligible to use the US National Organic Program label. The EU also has recognized India's standards. This opens up an international market for export to Indian farmers.

2.2. Regional Trends

Ethiopia operates with a Green Growth vision of seeking to, "Achieve middle-income status by 2025 in a climate-resilient green economy". Ethiopia's ambition is to become a "green economy front-runner" in the region. The country intends to follow a green growth path that fosters development and sustainability at the same time. The country's green economy plan is based on four pillars: Improving crop and livestock production practices for higher food security and farmer income while reducing emissions; protecting and re-establishing forests for their economic and ecosystem services, including as carbon stocks; expanding electricity generation

⁹ Green Suppliers Network. Available at <http://www.gsn.gov/about/index.html>

from renewable sources of energy for domestic and regional markets; and leapfrogging to modern and energy-efficient technologies in transport, industrialization, and building construction. As part of the strategy, the government has selected four initiatives for fast-track implementation: exploiting the vast hydropower potential; large-scale promotion of advanced rural cooking technologies; efficiency improvements to the livestock value chain; and Reducing Emissions from Deforestation and Forest Degradation (REDD).

Additionally, the Government did develop its green manufacturing strategy that was designed to increase the productivity and competitiveness of the Ethiopian industry. To achieve the desired green manufacturing vision, the following strategies have been deployed¹⁰:

- Enhance cooperation, set consensus goals and priorities, and establish a coordinated approach to green manufacturing among relevant government institutions and departments;
- Institutionalize communication channels between subsector institutes and the Ministry of Industry to enable the environmental directorates/departments to work with the Industry Ministry in solving issues together through knowledge sharing, joint financial planning and general capacity building, including contracting of external assistance;
- Create a communication platform between subsector environmental directors/department heads;
- Develop training modules to assist government entities to increase their knowledge and skills to best implement environmental duties and initiatives;
- Engage in advisory support networks to build local capacity in subsector institutions;
- Establish a common information clearinghouse accessible to all manufacturing sector stakeholders;
- Update the Ethiopian Environmental Standard for Industrial Pollution Control based on standards of strategic export markets;
- Provide infrastructure and build capacity to implement a comprehensive system for monitoring the environmental and social standards of the manufacturing sector and reporting and storing results;
- Develop infrastructure to monitor and record harmful non-GHG emissions;
- Develop an industrial park operational framework that incorporates the green manufacturing practices presented in this Green Manufacturing Strategy for Ethiopia and this accompanying Action Plan based in the IPs according to requirements stipulated in the International Framework on Eco-Industrial Parks prepared by UNIDO, WB and GIZ;
- Implement comprehensive reduce, reuse, recycle programs in manufacturing factories;
- Invest in appropriate facilities to collect, process and dispose of non-hazardous and hazardous industrial waste;
- Determine a solution for safely processing (oxidizing, neutralizing) hazardous waste;
- Conduct a study to determine feasibility of constructing a waste-to-energy facility to divert the non-reusable, non-recyclable, combustible portion of industrial waste from landfills;

¹⁰ Green Manufacturing Strategy for Ethiopia, 2019. Growing Industry Sustainably

- Establish awareness mechanisms that will be evaluated for effectiveness and continually adapted to stay abreast of global environmental concerns and trends;
- Establish infrastructure to encourage and assist manufacturing enterprises to implement/achieve RECP, EMS, ISO 50001 Energy Management Standard and other international environmental and/or social certifications;
- Monitor social compliance concurrently with environmental compliance;
- Raise awareness of the benefits to, and provide incentives for, companies measuring and recording input consumption, company waste generation and effluent discharge as well as social data and establish baseline data for environmental and social monitoring;
- Apply energy efficiency measures and alternative production processes in process and engineering industries to reduce GHG emissions and meet SDG targets by 2030;
- When Ethiopia's imminent electricity infrastructure upgrade is complete, companies will be required to substitute fossil fuel powered equipment with renewable energy-powered equipment – e.g., on-grid electricity or company-generated renewable energy (biomass, solar, wind);
- Improve companies' materials selection, storage and management practices;
- Develop a common test facility for all subsector institutes;
- Conduct capacity building of experts in the subsector institutes regarding enterprise-level environmental performance testing;
- Develop and implement a green manufacturing policy framework that will include mechanisms and instruments to create incentives and support services to green manufacturers and establish MoTI's involvement in designing appropriate green financing mechanisms targeting the manufacturing sector;
- Develop and introduce diverse forms of green funding mechanisms and types of incentives/supports to finance and promote green manufacturing practices in Ethiopia;
- Develop a clear link between business license renewal and environmental compliance based on environmental clearance letters;
- Government of Ethiopia (GoE) to offer financial incentives and green funds;
- GoE to develop eco-labeling for manufactured products;
- Support development of environmentally friendly technologies;
- Strengthen the social performance implementation framework by adopting and implementing legislation and standards that will guide occupational health and safety services;
- Strengthen and create enabling mechanisms for law enforcement and compliance with social standards;
- Strengthen institutional capacity through the provision of adequate instruments (laboratory testing equipment, re-agents, kits, etc.) and deployment of trained human resources;
- Build the implementation capacity of occupational health and safety through strengthening national collaboration and cooperation between MOLSA, MoTI and professional associations;

- Develop mechanisms/policies for enhancing the social performance of manufacturing enterprises within the workplaces, particularly in regard to vulnerable workers with respect to their physical strength, nature of vulnerability and endurance and immunological capacity against diseases of the workers;
- Encourage and motivate manufacturing enterprises to be good corporate citizens by undertaking their corporate social responsibility and adhere to rules and regulations;

2.3. Kenya Green and Circular Economy Outlook

2.3.1 Baseline Survey Findings

Overview – demographics

Number of Interviewed Businesses by County

A total number of 65 businesses were surveyed across varied sectors in Nairobi, Mombasa, Kisumu, Meru and Garissa Counties. Figure 3 indicates the number of interviewed businesses per county.

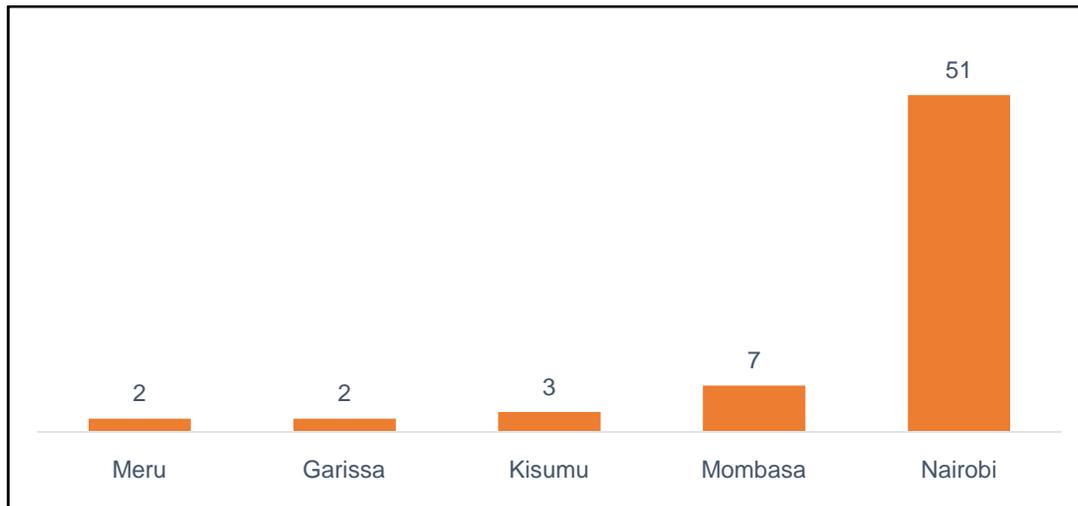


Figure 3: Number of Interviewed Businesses per County

As expected, the largest number of businesses are in Nairobi that is the country’s Administrative capital with the most enabling business environment.

Position of respondent In the Company

Over half (55%) of the respondents were in technical and operational positions while a third (34%) were top-level management. The rest (11%) were from the finance accounts and Human resource departments (Figure 4).



Figure 4: Position of Respondent in Company

Feedback from top management is key given that top management commitment is critically essential for the private sector’s successful transformation to the green and circular economy practices.

Age of the Company

Most of the companies (42%) were between 5 to 10 years old since establishment. This was followed by nearly a quarter (22%) being 11 to 15 years old, 17% over 20 years old, 11% being 16 to 20 years old and 9% under years of existence (Figure 5).

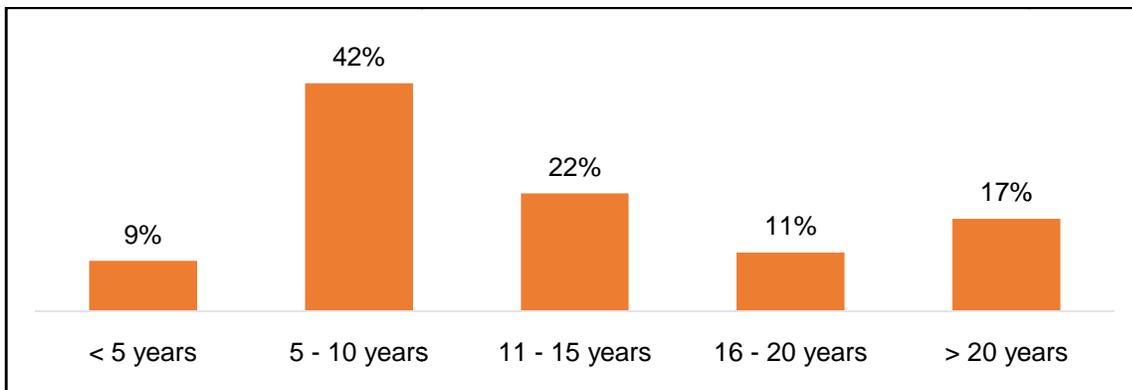


Figure 5: Age of the Company

The focus was on companies that are past the 3 year valley of death. These means that they are capable of adopting green and circular economy business models without the risk of winding up.

Main Sector of business Action

When it comes to the sector under which these companies fall, nearly a third (31%) were within the manufacturing sector, 17% within the energy sector, 12% in Agriculture and the rest within the transport, construction, financial services, food processing, trade, tourism and mining sectors (Figure 6).

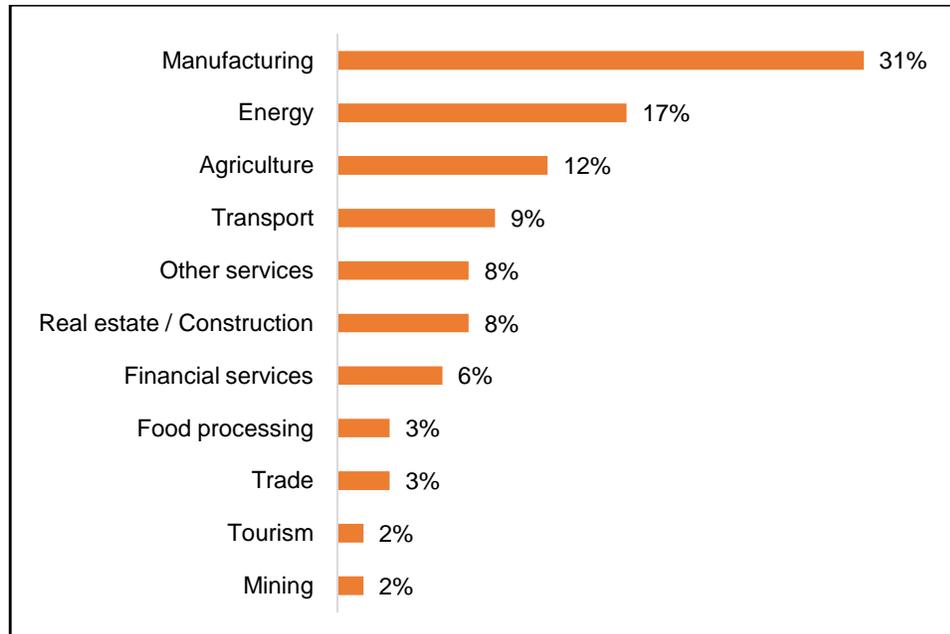


Figure 6: Main Sector of Business Action

2.3.2 Sector Focus

Waste

Waste management is one of the major challenges facing urban centers mainly in towns, cities, market places and some settlements¹¹. Waste arising from social, domestic and industrial activities is increasing in quantity and variety as a result of growing population, rising standards of living and development of technology. When basic services such as the collection and disposal of waste are inadequate, problems associated with poor waste management such as water and land pollution, blocking of access ways, reduced aesthetics of the environment, health related problems and loss of revenue among others spring up (WB, 2018).

Although circular economy is increasingly being viewed internationally as a necessity and opportunity, integrated solutions to the issue of waste are still not at the forefront in practice locally. Circular economy initiatives provide opportunities to create new value streams from materials previously discarded¹². These principles extend beyond traditional waste management enhancement practices, emphasizing improved design and production practices to eliminate the traditional concept of waste and repurposing resources from products at the end of their life cycle back as raw material inputs to create new products (UNEP, 2011).

This baseline survey assessed the waste management practices of businesses in five counties across the country. The survey focused on identifying the types of waste the businesses generate,

¹¹ World Bank, 2018. What a Waste 2.0, A Global Snapshot of Solid Waste Management to 2050

¹² UNEP, 2011. Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication

means of disposal, challenges faced during disposal, waste re-cycling and exchange, as well as what needs to be done to ensure re-cycling. From the findings, over half of the wastes were inorganic, plastic bags, hydro carbons and polymers. This was followed by metal elements and organic as well as office related waste as indicate in (Figure 7).

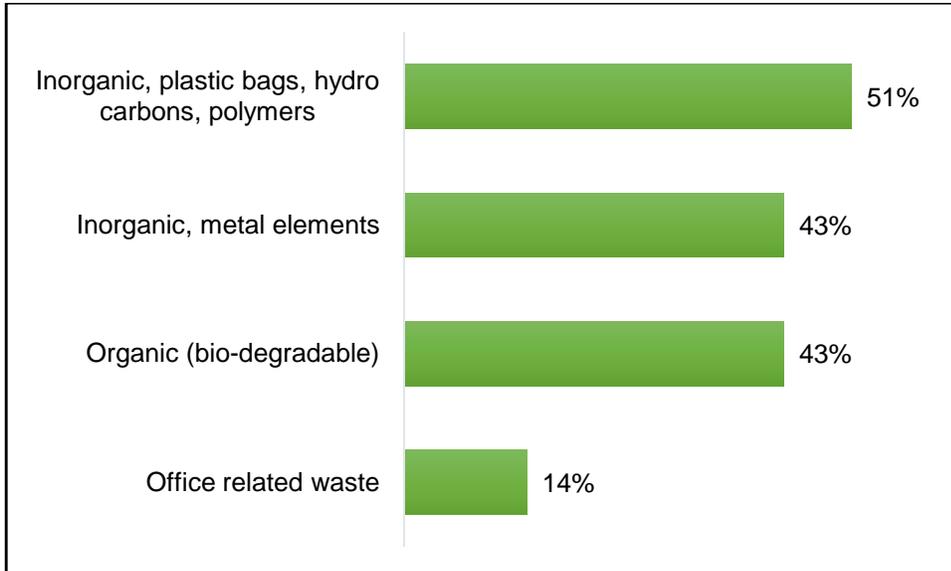


Figure 7: Types of Waste the Companies Generate

From the private sector’s perspective, the 51% plastics should be collected for recycling, 43% metal should be recovered for resale, and 43% organics should either be composted or put into a biogas digester for energy generation. All these interventions are capable of creating jobs and wealth. For this to succeed, there is need for strict waste segregation at source.

The surveyed businesses faced several challenges associated with waste disposal. The main challenge faced was the cost (74%), followed by inadequate infrastructure and technology (43%), conformance to regulations (38%), inadequate waste management mechanisms (32%), onsite storage of waste (28%), and inadequate record of waste streams (18%) (Figure 8).

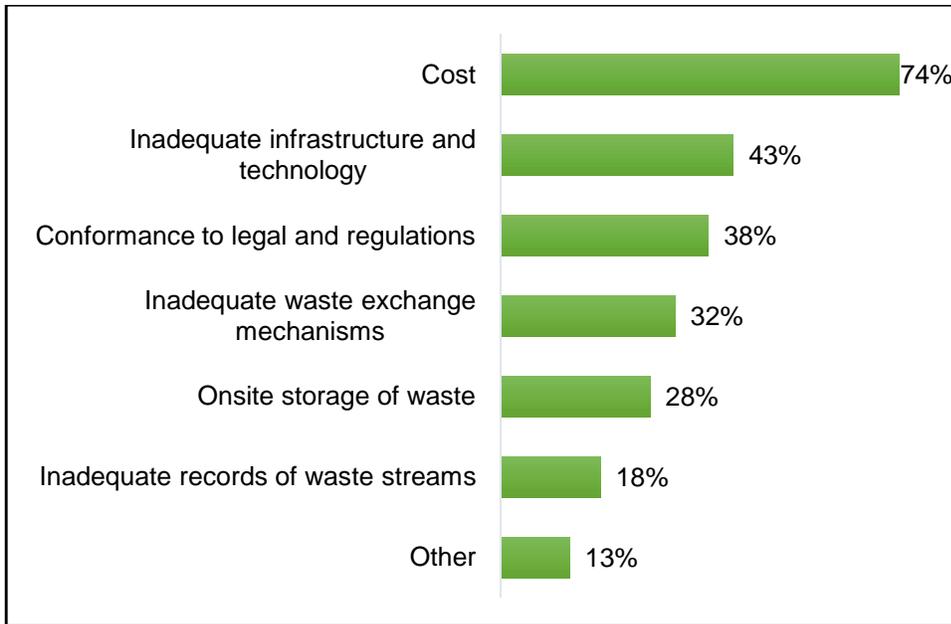


Figure 8: Challenges Faced by Companies in Waste Disposal

Waste management is costly. Deriving value from waste will help create an additional energy stream. This requires that the Government works to create incentives in terms of low interest green credit lines to enable the private sector afford the desired green transition. Additionally, the waste management infrastructure will need to be upgraded to make provision for useful materials recovery and temporary storage, review and harmonization of waste management regulations to make them facilitate and prioritize the green economy. Easy access to climate friendly technologies will also aid value recovery from waste.

When it comes to the sale of any waste generated by the companies to the community or recycling entity, only 40% of the companies managed this while nearly a quarter (23%) of the companies sold their waste to other companies. 18% of the companies exchanged the waste they generated with other companies (Figure 9).



Figure 9: Reuse/ Sell of Waste

Company sale of waste to communities and other companies is a good practice that needs to be made mainstream. It can form the basis for waste and by-product exchange among companies through industrial symbiosis. This will require the development of in-put/ out-put data bases to aid energy and material exchanges between and among the participating companies.

Most companies estimated revenue from the trade in waste per month was less than Kshs. 50,000, indicating that not so much revenue was generated from the sale of waste as indicated in Figure 10. This means that the potential is yet to be fully exploited. This can be attributed to lack of incentives and a set of barriers that need to be overcome.

	<i>Count</i>	<i>Percentage</i>
<i>Less than Ksh. 50,000</i>	22	76%
<i>50,000 – 100,000</i>	5	17%
<i>100,001 – 250,000</i>	1	3%
<i>More than 500,000</i>	1	3%
<i>Total</i>	29	100%

Figure 10: Total Estimated Revenue from Trading in Waste per Month in KShs

The survey established that cutting costs was the main motivation that drove companies towards recycling (37%), followed by improved efficiency and improved profits (17%) (Figure 11).

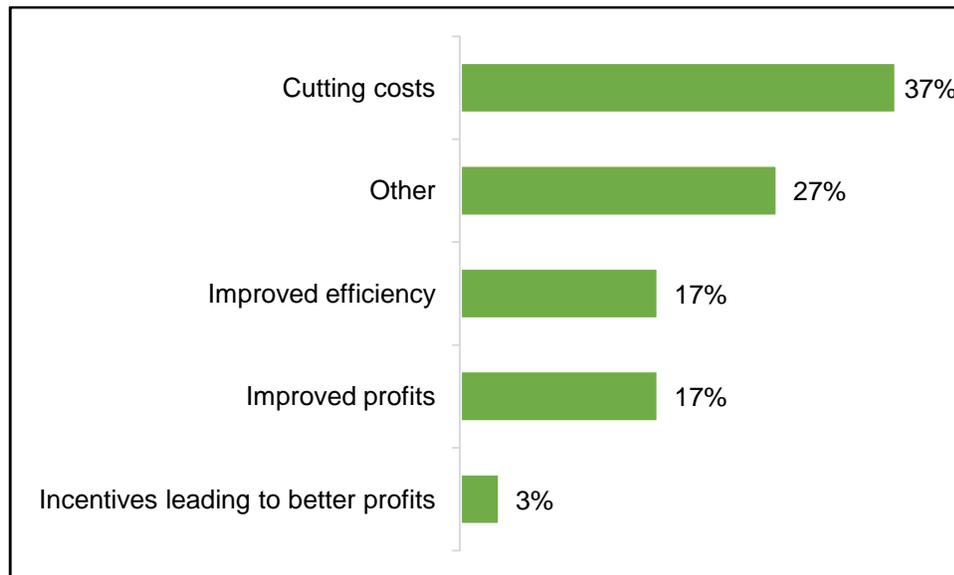


Figure 11: Motivation to Recycle (n = 30)

When it comes to those companies that did not re-use/recycle waste, the main reason was the nature of the waste, followed by the lack of incentives to carry it out (Figure 12).

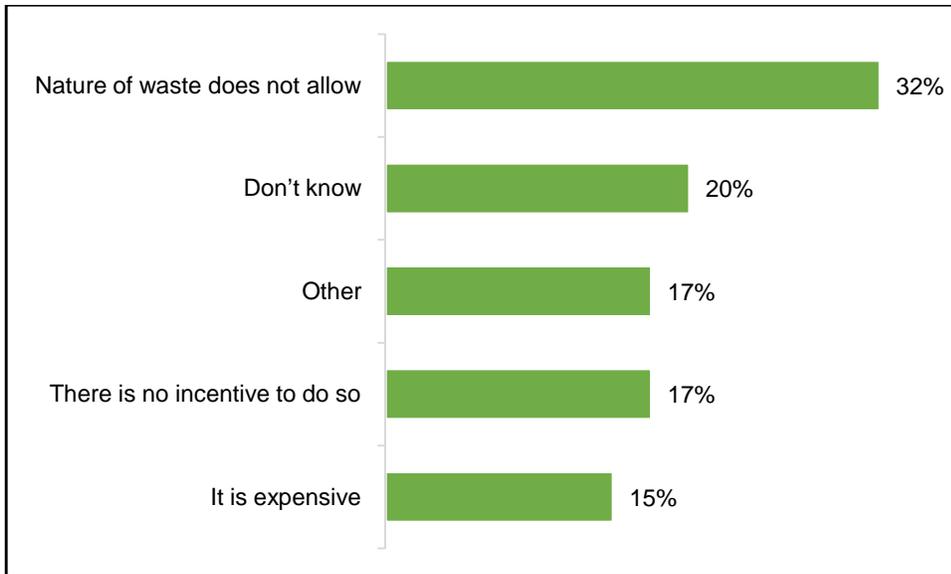


Figure 12: Why Companies re-use/ recycle waste (n = 41)

The 2018 European Commission survey entitled, “Industrial Symbiosis Cooperation Fostering, Market Potential, Good Practice and Enabling Policy Actions”, identified the following as the key barriers that hinder companies from going green (Figure 13).

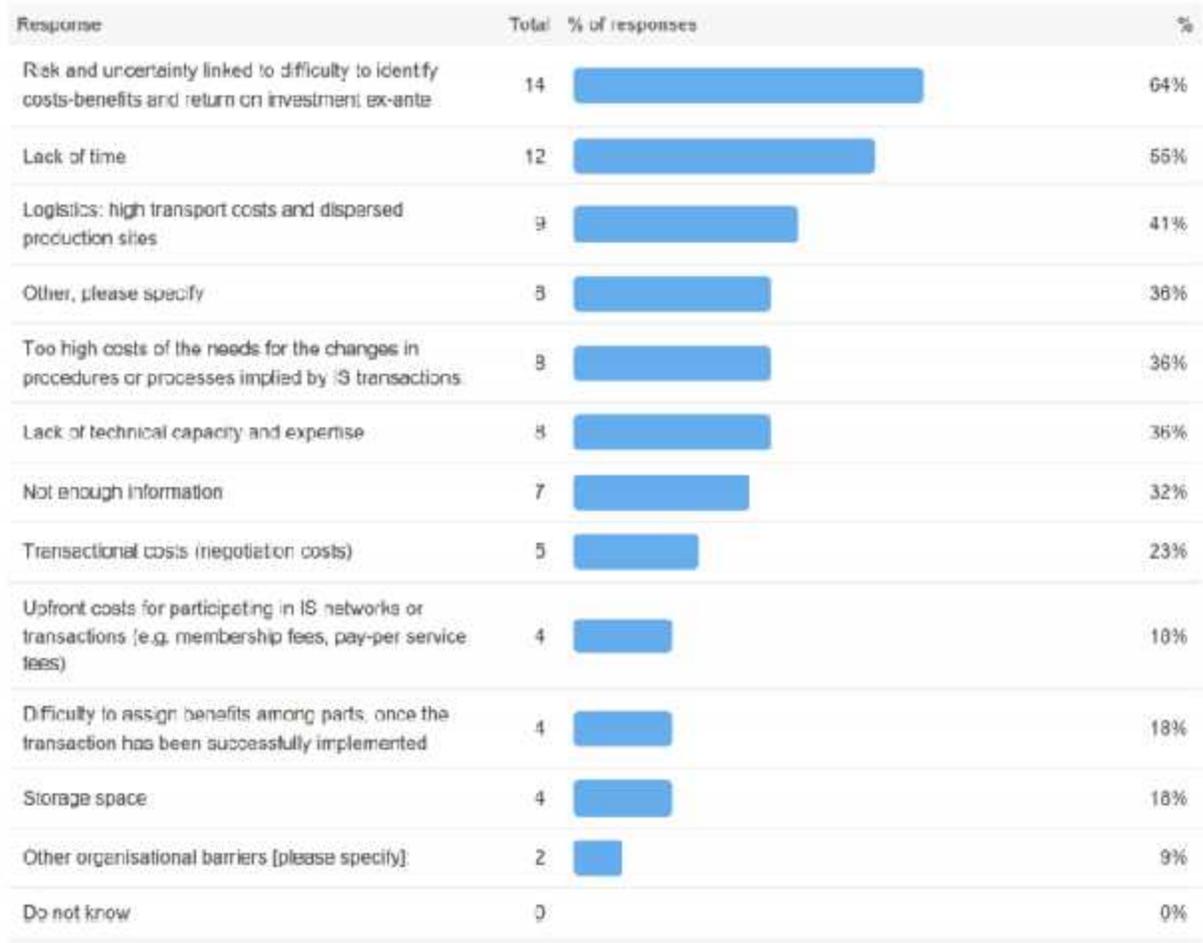


Figure 13: Barriers to Green Growth

Lack of waste segregation at source tends to render the waste materials unsuitable for direct reuse.

The findings indicated that for most companies to start recycling, there was need for training on recycling for nearly half of the companies (44%), followed by the implementation of recycling friendly policies (24%), as well as provision of incentives (22%) (Figure 14).

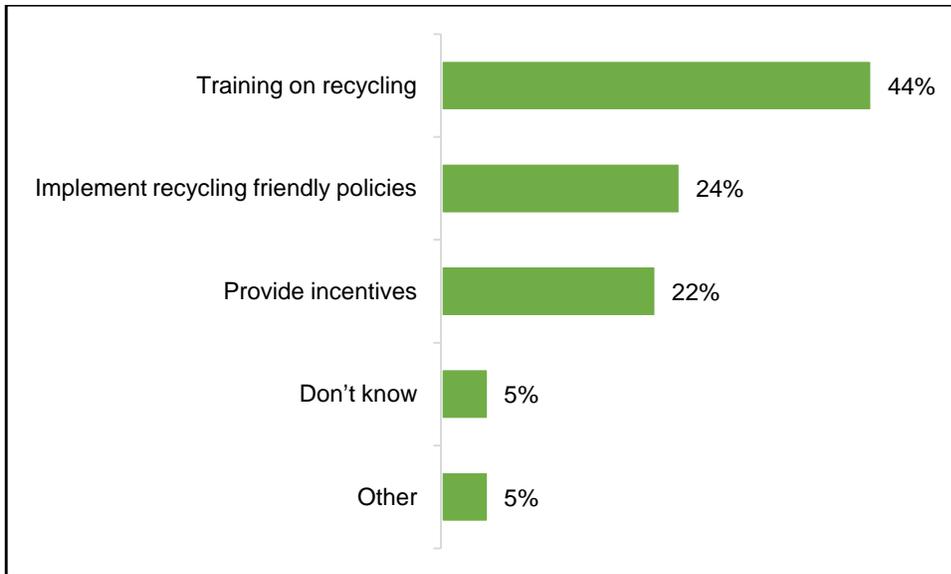


Figure 14: What can be done to encourage recycling

The 2018 European Commission survey entitled, “Industrial Symbiosis Cooperation Fostering, Market Potential, Good Practice and Enabling Policy Actions”, identified the following as the key drivers for companies that aspire to go green (Figure 15).

Response	Total	% of responses
Decrease company costs with resources (e.g. energy / raw materials / water etc.)	14	64%
Reduce the waste the company is generating	12	55%
Create new areas of revenue	11	50%
Increased turnover for the company	10	45%
Building new partnerships with other companies	10	45%
Help to achieve the environmental policy and targets of the company	9	41%
Changing the company's business model to a more sustainable one	8	38%
Help divert waste from landfill	7	32%
Access to innovation	6	27%
Acquiring new clients	6	27%
Improved quality/security of inputs	4	18%
Satisfaction of CSR requirements	4	18%
Create jobs	3	14%
Other, please specify	0	0%
Do not know	0	0%

Figure 15: Divers of Green Growth

The findings indicated that the county government had a bigger role to play in encouraging recycling, with respondents pointing out that the provision of incentives and training on recycling as key areas. The national government was tasked with the implementation of recycling friendly policies as the key role (Figure 16).

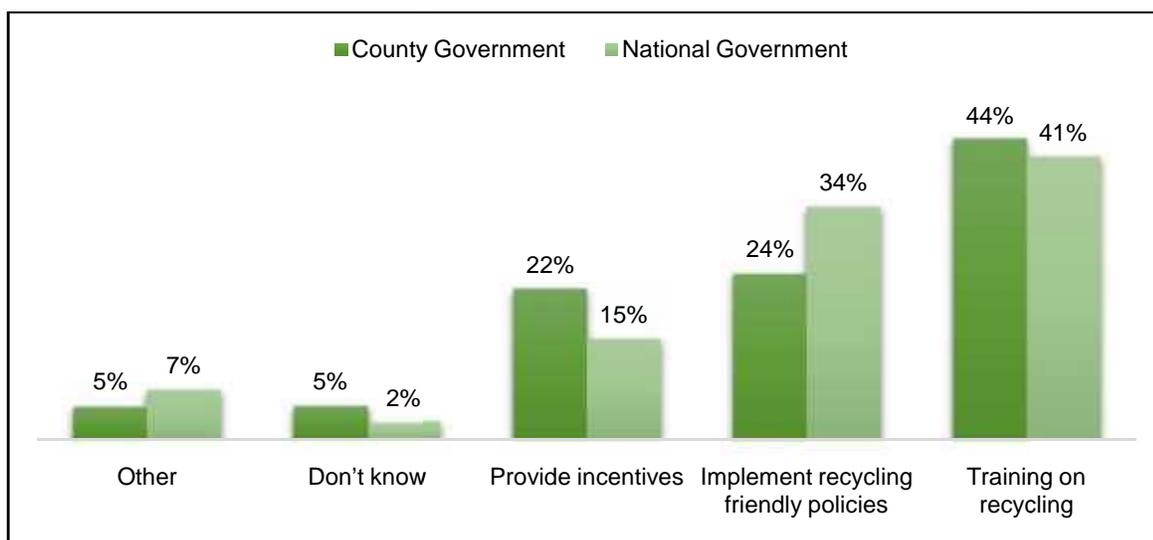


Figure 16: Role of National Government Vs County Government in Encouraging Recycling

Further findings from key informant interviews emphasized that despite the existence of laws and policies to regulate and guide waste management, weak implementation and poor practices had led to towns and cities being overwhelmed by their own waste as seen in Meru, Garissa, Kisumu, Mombasa and Nairobi, therefore affecting public health and the environment. Lack of legal enforcement, poor infrastructure and lack of sorting waste continues to be a challenge. Further insufficient funds, lack of technical and institutional capacity, lack of public awareness and knowledge, lack of adequate space for disposal and lack of political good will has accelerated poor waste management. There is poor handling of waste at the individual business levels including lack of segregation, reuse, reduce and recycling. In addition, negative attitude towards waste management and failure by the public to take individual responsibility has contributed to poor practices such as illegal dumping, littering and open burning.

Energy

Access to all forms of energy at affordable prices is an impetus for economic and social development of the society. At the same time, energy sector is responsible for approximately 75 percent of total greenhouse gases emissions, which makes it the main provocative of climate change¹³. The convergence of international concerns about climate change and energy security in the past decade has led to the increased awareness of policy-makers and general public about energy issues and creation of new energy paradigm, the focus of which is energy efficiency and use of renewable energy. Energy efficiency plays a fundamental role in promoting and supporting the development of a low carbon economy, as well as optimizing the use of energy carriers in the different sectors.

The relevance of energy efficiency in business activity has been widely investigated in economic sciences literature. There is in fact strong empirical evidence that the adoption of efficient technologies to reduce energy consumption represents an optimum for all stakeholders involved. This survey sought to identify the adoption of company-wide policies on electricity and energy management, review and tracking of energy usage, government engagement on energy, as well as existing energy partnerships.

From the findings, over two third of the companies had a policy on electricity management (65%) as seen in the table that prioritized energy efficiency (Figure 17).

¹³ UNEP, 2012. Green Economy: What do we mean by Green Economy?

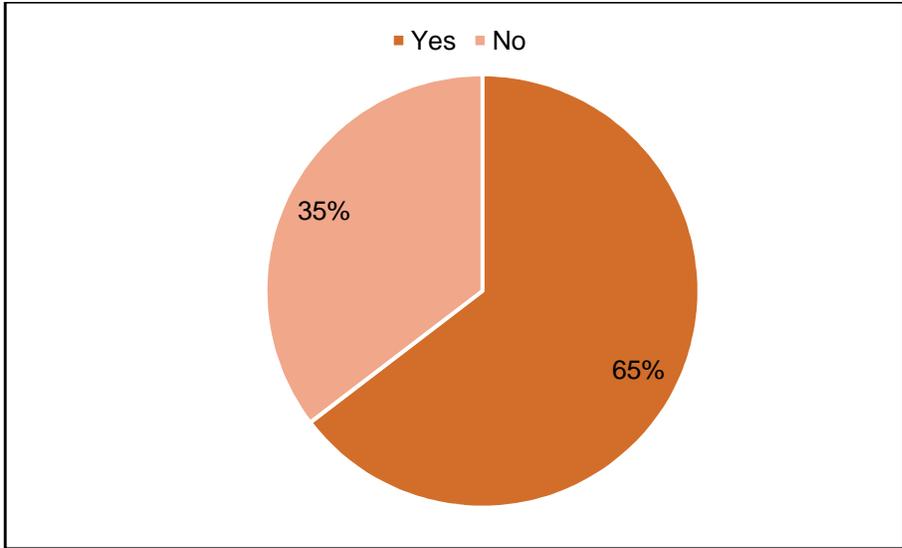


Figure 17: Organization/ Company with Policy on Electricity Management

As part of energy efficiency, it is crucial for companies to review and track the usage of energy. This helps in identifying energy consumption habits, which can be used as a basis to set new goals to become more energy efficient and save money. From the study findings, majority of the businesses kept records of energy usage, reviewed energy bills, considered energy efficiency in their decision-making, were able to identify the largest of energy-consuming utilities, review and identify energy efficiency opportunities, were able to control energy levels and had a specific member of staff responsible for business energy usage (Figure 18).

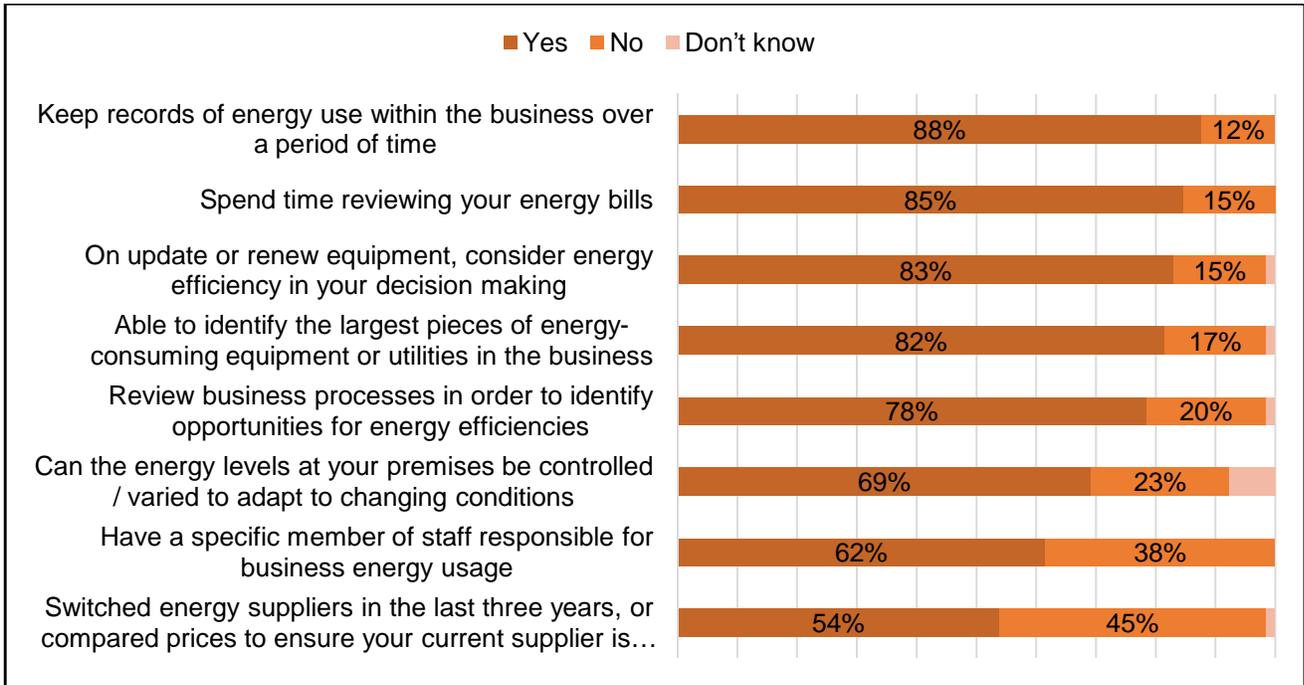


Figure 18: Review and tracking of energy use in the Company

To better understand the societal and technological transformations required to achieve secure low-carbon energy systems, decision-makers often develop different energy scenarios using expert modelling as well as stakeholder input. However, public perspectives are seldom explored, even though they matter a great deal. Citizen engagement with the government in policy making represents an increasingly popular mechanism for both civic rejuvenation and environmental policy innovation. From the survey findings, when it comes to engagement with both the County and National governments under initiatives to support clean energy generation, a majority of the respondents pointed out that they had equally engaged with both governments as shown in Table 19. Therefore a greater understanding of public views on energy change should go a long way in improving dialogue, encouraging more robust decision-making, and highlighting potential points of contention.

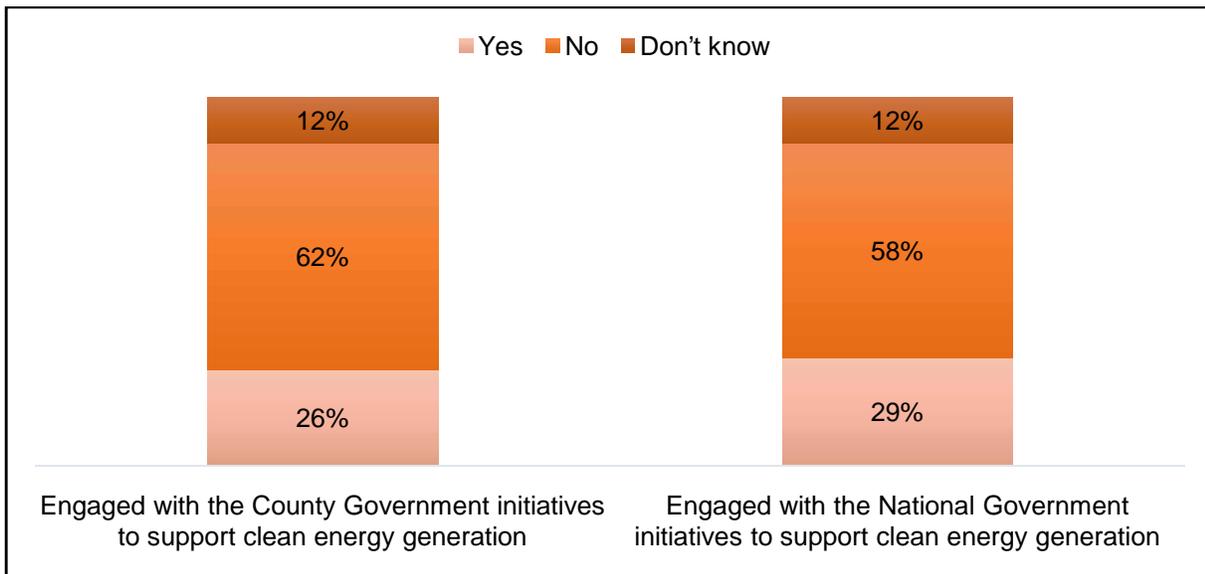


Figure 19: Government Engagement on Energy

When asked whether they were involved in any kind of business energy partnerships, nearly half of the respondents agreed to the possibility to work with neighboring businesses to build a local energy network. However, a majority of the respondents (57%) made it clear that they do not currently share energy information with other businesses in their locality or sector while nearly a third do share. Over two thirds of the respondents also indicated that they were not involved in any form of business energy partnership (Figure 20).

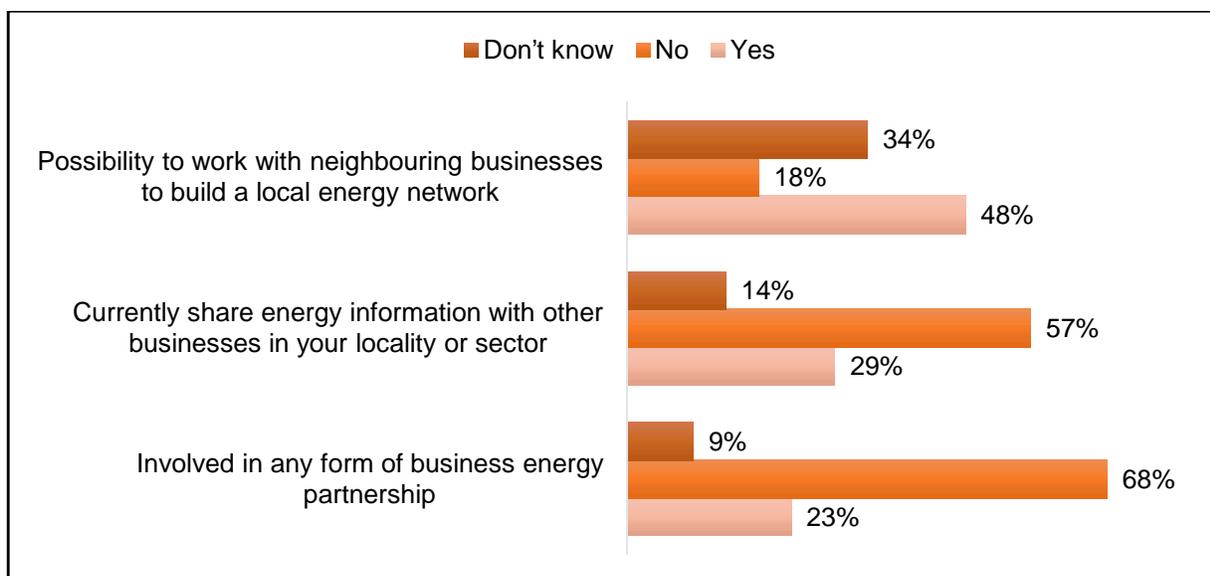


Figure 20: Energy Partnerships

Water

Water is at the core of sustainable development and is critical for socio-economic development, energy and food production as well as healthy ecosystems. Water efficiency can contribute to the circular economy by closing water loops and recovering resources from water¹⁴. Water efficiency and management covers the whole water cycle, namely; surface water management and groundwater management, drinking water production and transport, and sewerage and wastewater treatment and disposal. All of these elements offer opportunities to realize a circular economy. Water reuse closes the loop between water supply and sanitation and provides an alternative water source. Wastewater treated to the right quality can replenish water supplies and reduce the demand and availability gap. The transition to a circular economy has the potential to transform current barriers to exploitable opportunities such as water reuse. This survey examined various aspects of water efficiency, including water management policies as well as water usage and recycling. A lack of water in the most basic sense limits the amount of water a company can use and therefore the amount of goods it can produce. Water scarcity also has secondary impacts on businesses, with significant implications, for example, on the production of energy on which industry relies. Furthermore, societal expectations for corporate sustainability, including efficient and responsible water-related policies and practices, are also on the rise. Companies perceived to mismanage scarce water resources are likely to suffer damaged reputations, especially when their operations negatively affect basic human and environmental needs or contravene legal requirements.

From the survey findings, nearly two thirds of the surveyed companies had a water management policy in place (Figure 21).

¹⁴ UNEP, 2014. Green Economy Assessment Report – Kenya

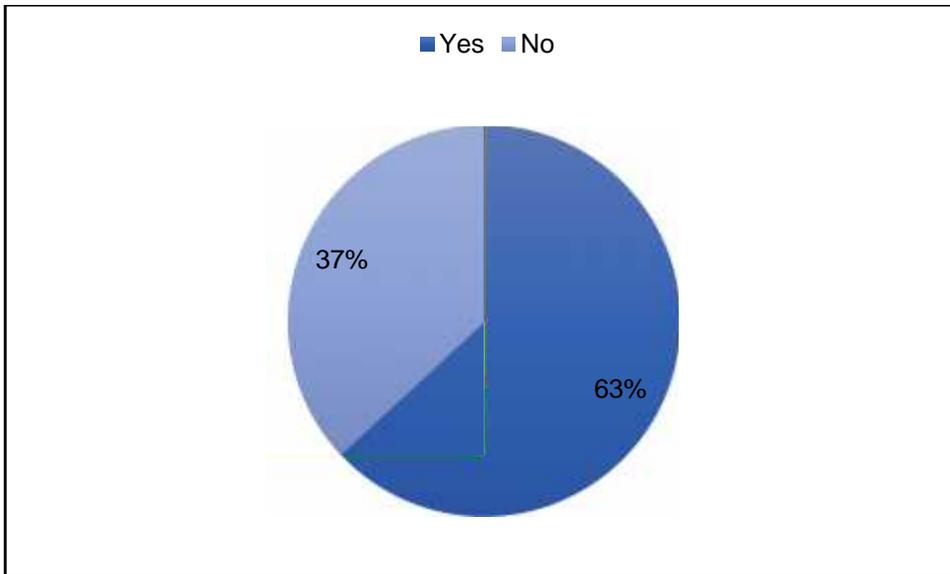


Figure 21: Organization/ Companywide Policy on Water Management

A majority of the surveyed companies kept records of water use, reviewed their water bills and business processes to identify water efficiency opportunities, while having a specific member of staff responsible for water usage. However, over three quarters (77%) of the surveyed companies did not recycle any water used (Figure 22).

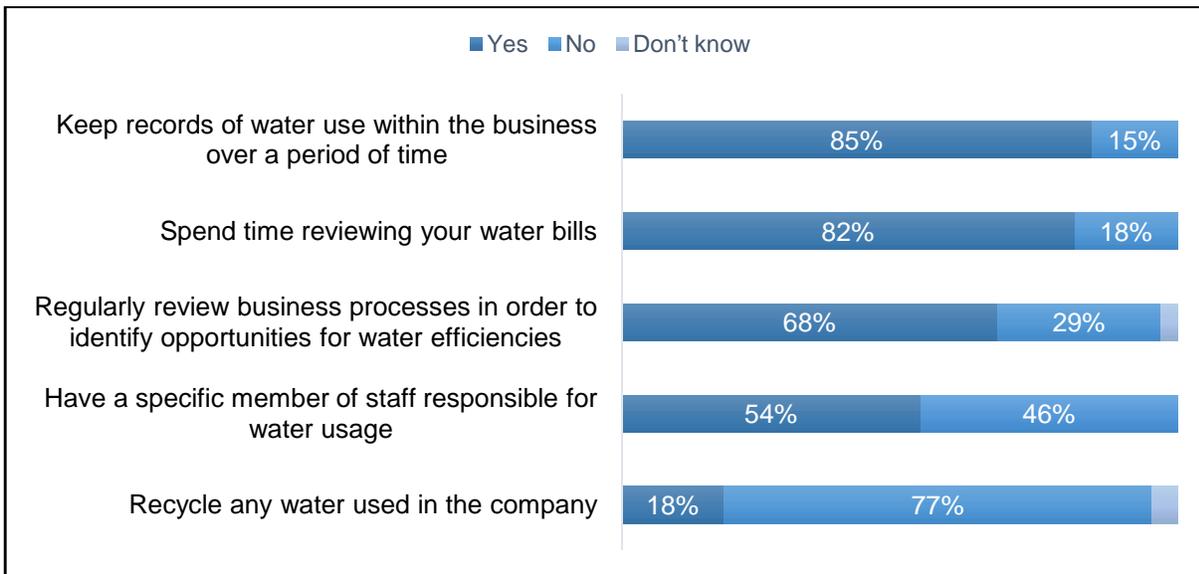


Figure 22: Water Management and Recycling

Human Welfare

The concept of Green and Circular economy offers an avenue to sustainable growth, improved human welfare while saving the environment and its natural resources. Some of the key constituents of human welfare and social equity which are associated with green and circular economy features are creation of green jobs, production of green commodities, fair distribution of total wealth, access to green energy technologies, plus availability of clean water and clean

sanitation (UNEP, 2011). This survey sought to identify from the respondents whether green and circular economy would help create more jobs for citizens and lead to a better environment. From the findings, most respondents agreed that green and circular economy will help create more jobs for citizens and a better environment as shown in Figures (23& 24).

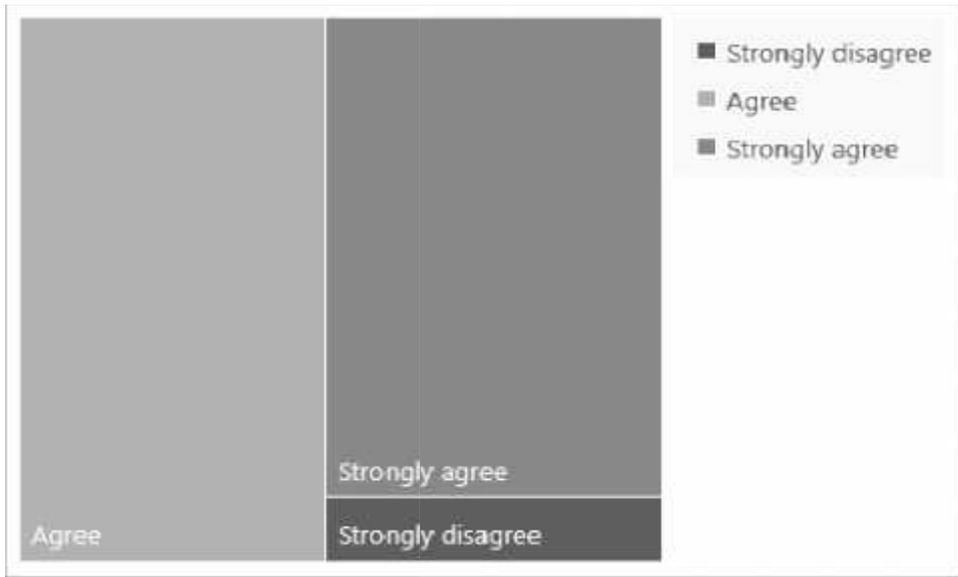


Figure 23: Green and Circular Economy will help create more jobs for Citizens

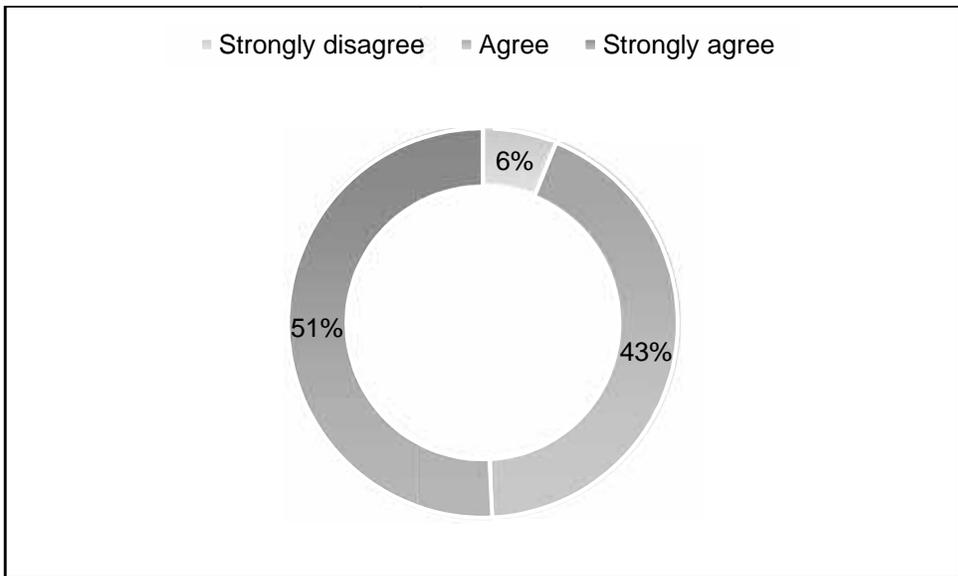


Figure 24: Green and Circular Economy will lead to a better environment

From the findings, two thirds of the respondents agreed that consumers were willing to pay slightly more for eco-friendly products and services with only 8% disagreeing. This finding is similar to the results of a study conducted by the Kenya Climate Innovation Centre (KCIC) together with the Kenya Association of Manufactures (KAM) dubbed “The State of

Environmental Performance of Firms in Kenya’ that highlighted the increasing shift among consumers towards green products. Majority of the respondents also agreed that there would be more availability of natural resources due to efficient use, a safer working environment would be promoted with minimized waste, and in general would lead to more inclusion of all in economic activities (Figure 25&26).

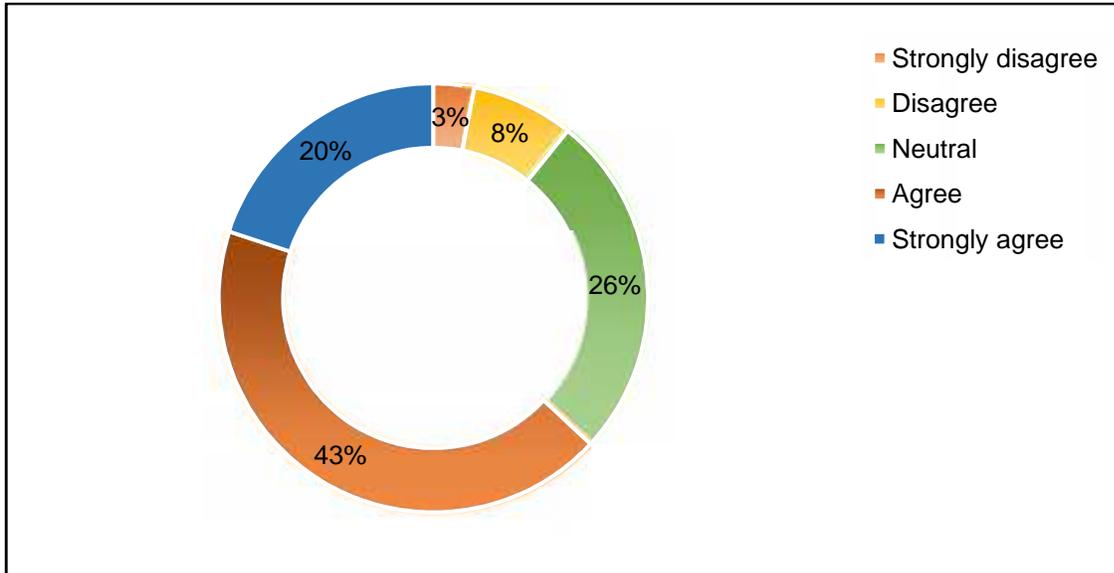


Figure 25: Consumers are willing to pay slightly more for eco-friendly products and services

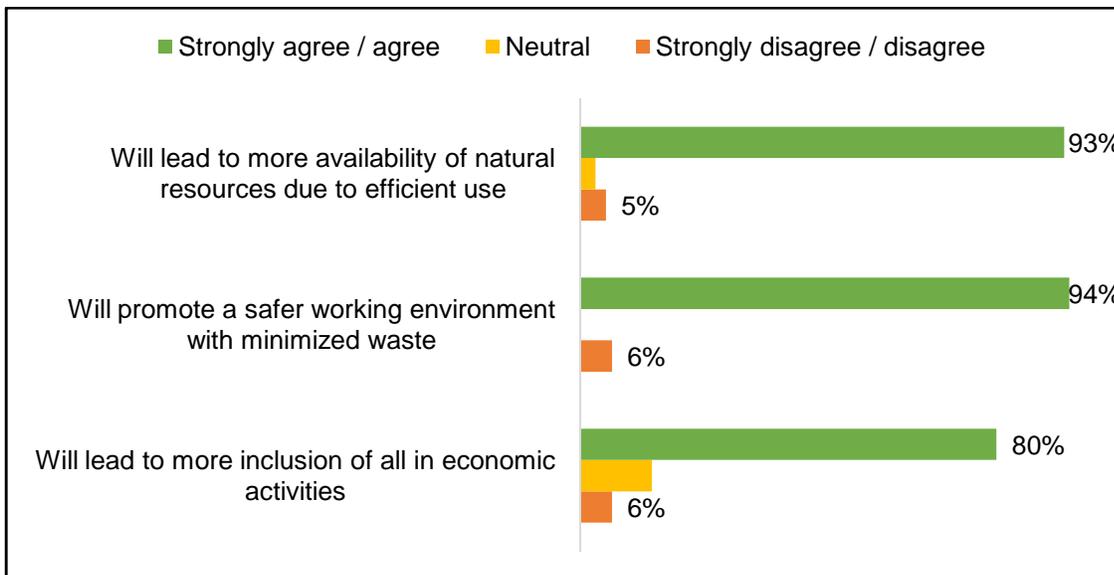


Figure 26: Resource use, safe working environment and inclusivity

Ecosystem Resilience

The application of resilience thinking to efforts to shape the circular economy transition may help to ensure this new economic paradigm creates positive value for both society and planet. A circular economy is focused on designing out waste and pollution, keeping products and

materials in use, and regenerating natural systems to ensure that the planet resources are not exhausted. To do this, concepts embedded in the circular economy warrant special attention in their relationship to resilience. From the survey findings, two thirds of the respondents made it clear that their products are developed such that longevity is considered while slightly over half of the respondents indicated that their company designs their processes so that they can re-use waste (Figure 27).

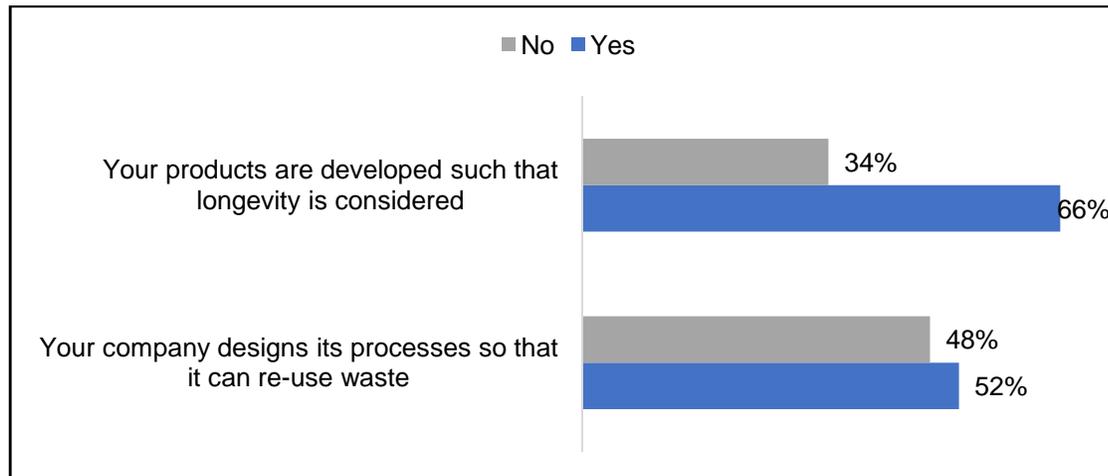


Figure 27: Product Life and Design

Key Informant Interviews

Green Growth and Circular Economy in Kenya: Policies and Strategies

While Kenya is yet to fully transform into GGCE, it has made progress in transitioning to a Green Growth and Circular Economy (GGCE). The transformation to a GGCE has to be seen in the context of the Kenyan governments GGCE strategy. The GoK has taken several steps towards a GGCE and developed a strategy that seeks to consolidate, scale up and embed green growth initiatives in national development goals. The Green Economy Strategy and Implementation Plan (GESIP) provides the overall policy framework to facilitate a transition to a GGCE and outlines the need to mainstream and align GGCE initiatives across the economic, social and environmental spheres. It is expected that a GGCE will protect the country’s natural capital, reduce environment and climate footprint, improves competitiveness and spurs economic growth which in turn would create green and decent jobs. The Green Economy Strategy is geared towards enabling Kenya to attain a higher economic growth rate consistent with the Vision 2030, which firmly embeds the principles of sustainable development in the overall national growth strategy.

The policy framework for GGCE is designed to support a globally competitive low-carbon development path through promoting economic resilience and resource efficiency, sustainable management of natural resources, development of sustainable infrastructure and providing support for social inclusion (Government of Kenya, 2016). It is spearheaded by the Ministry of Environment and Natural Resources, through an inter-agency steering committee that comprise of experts representing key government sectors, civil society and development partners. Some of the other key policy and regulations include the ban on single-use plastic bags (2015) that made Kenya the second African country to completely ban the use of single-use plastic carrier bags. In

addition to the general ban on the use of single-use plastic carrier bags, there is also the ban on the use of single-use plastics in natural areas (2020). These natural areas include national parks, beaches, forests and conservation areas. Through this policy, the Kenyan government hopes to reduce plastic pollution in the country's most vulnerable areas, which are also a valuable source of income for the country's tourism sector (UNEP, 2020). Other key policies and regulations include the Revised National Building Regulations (2020) and the Sustainable Waste Management bill (2020), which is currently under review by the parliament. The Sustainable Waste Management bill (2020) reforms the waste management sector through the lens of CE principles. The bill also includes provisions for the development of a new Extended Producer Responsibility (EPR) policy. In the current design of the EPR policy, private sector associates will be involved in the development, implementation and enforcement of the new policy as the ministry of Environment lacks the required enforcement capacity.

Most of these policies have been primarily driven by the Ministry of Environment and Forestry, which is one of the weaknesses of Kenya's CE policy up to now. Circular economy is an inherently horizontal and cross-cutting concept that touches upon many aspects of the economy and society. Therefore, for CE policy to be successful it is important that a holistic CE policy is developed, that has an integrated approach across economic sectors and that is supported by all relevant national ministries and appropriate intergovernmental structures. Setting up a national circular economy action plan could be a valuable step to give direction to CE development in Kenya.

The adoption of green and circular economy practices by Kenyan businesses is still at its infancy (just beginning to take shape and currently associated with a limited market share control by the green and circular business models). The concept is relatively new and incentives are required to enable companies successfully adopt circular principles.

Although remarkable progress has been made as regards the creation of an enabling legal and regulatory framework, a lot more still remains to be done if the much-anticipated green transition is to become mainstream. The current legislative framework is mostly based on linear thinking and seeks to maintain business-as-usual. The Kenyan Government needs to take the following measures so as to help accelerate the adoption of green and circular business practices in the country (i) incentivize circular business models through policy instruments that help to improve access to finance, the provision of tax incentives and subsidies, integration of resource efficiency criteria in procurement policies and practices, and enabling industrial symbiosis exchanges; (ii) developing voluntary and/or binding mechanisms to help mainstream circularity in business models through the promotion of eco-design and material re-use standards, certification schemes, eco labeling requirements, and extended producer responsibility; (iii) provision of institutional support to circular business models through the development of indicators and targets for resource use efficiency, harmonization of waste and material use regulations, and facilitation of partnerships between key resource users; and (iv) enabling behavioral shift among consumers through consumer awareness and education programmes, with a view to seeking to embrace the emerging culture of green consumerism.

There are many reasons why the implementation of the CE models has been limited in Kenya. Among them, is the lack of CE know-how of political decision-makers. Related to this are the recognized barriers for CE implementation: the lack of clear incentives, complex, conflicting and

overlapping regulations as well as the lack of adequate governmental support (EEA, 2019). In order to overcome the barriers of CE, it is essential that the knowledge of policy instruments and incentives are available and that their effects are fully described. Additionally, knowledge on how to implement such policy instruments and incentives that boost CE is needed. The importance of incentives for boosting CE has been emphasized by the European Commission (2019):

- *“In every aspect of the systemic transition, the default still is a linear business-as-usual approach. But in the end, the core driver for the transition can be reduced to incentives. These are the formal and informal rules that influence behaviour and decisions. Within each of the elements, we should look for incentives to make the circular business approach the preferred one.”*

The institutional framework for green growth promotion at both national and county levels is generally weak and needs strengthening. The baseline survey has found that there is need to provide policies and incentives in waste and material use, implement recycling of waste and provide training and awareness on GCE opportunities. Switching from linear to circular is a dramatic policy shift that needs to be subjected to a strategic environmental assessment. This will help us understand how many jobs will be created and how many will be lost so that we are in a position of maximizing the positives while minimizing the negatives. The private sector needs to take action so as to integrate climate change adaptation into its core strategic business planning and management processes (such as operations, supply chain management, and market strategies); align business goals and performance indicators to help reflect climate-resilient priorities, risks and opportunities; build a portfolio of climate resilient goods and services; and develop robust climate information platforms and communication channels.

A forward looking macro-economic assessment that analyzed the impacts of implementing a limited set of circular economy actions between 2020 and 2030 in selected priority sectors of Agri-foods, plastics, construction, e-waste, and general waste concluded that the adopted circular measures will lead to an increase of economic activity while creating additional jobs (positive economic impact). By 2030, Kenya’s GDP is projected to be around 0.5% higher in the circular economy scenario compared to the baseline scenario, meaning that the Kenyan economy would be slightly larger as a result of increased circular economy activity than it would be in a “business-as-usual” scenario. It will also register 46,000 additional jobs over and above the business-as-usual scenario, which is equivalent to an increase of 0.15%.

The private sector needs to take action so as to integrate climate change adaptation into its core strategic business planning and management processes (such as operations, green supply chain management, and green market strategies); align business goals and performance indicators so as to help reflect climate-resilient priorities, risks and opportunities; while building a portfolio of climate resilient goods and services; and developing robust climate information platforms and communication channels.

2.4. National and County Governments Arrangements for Green and Circular Economy

The institutional framework for green growth promotion at both national and county levels is generally weak and needs strengthening. There is also need to review and harmonize all the legal and regulatory provisions at county and national levels to avoid areas of conflict. Climate Change units need to be established at all County levels and their operations synchronized with those of the national institutions. The two levels of government should work with stakeholders to create fiscal incentives that will help accelerate the green and circular economy uptake. The circular economy is attractive in the sense that it is restorative by design - using and reusing natural capital as efficiently as possible and finding value throughout the life cycles of finished products. The three major principles that govern the circular economy are: preserving and enhancing natural capital by controlling finite stocks and balancing the flow of renewable resources; optimizing resource yields by circulating products, components, and materials in use at the highest possible levels at all times; and making the system more effective by eliminating negative externalities. Private sector circular economy proponents argued that it increases the productivity of resources, decrease dependence on them (as well as waste), and raises employment and growth. They maintained that a circular system would improve competitiveness and unleash eco-innovation. Resource productivity remains hugely underexploited as a source of wealth, competitiveness, and renewal.

The critical enabling factors for the green transition include the adoption of green public procurement practices to create and sustain demand for environmentally friendly products; building of green skill sets through training and re-training; making it easy to access green technologies; advancing green economy research and development; assuring easy access to green funds; as well as protection of intellectual property rights (IPRs). There is need for Tax incentives. For circularity to be achieved, it is important to create financial incentives for circular business models to be chosen over linear business models. Focus should be placed on lowering tax on labour and value-added tax on recycled products, increasing tax on virgin raw materials in favour of secondary raw materials, and on externalities.

Agriculture Sector Employment status and social well being

The 2020 UNECA study Report on unleashing the potential of the private sector to drive green growth and job creation pointed out that, the wage employment of the agriculture sector stands at 12 percent of the total wage employment and has been steady since 2017¹⁵. The report indicated that the private sector is the largest wage employer within the agriculture sector by 88 percent (KNBS, 2020a). The sector's output is largely represented by smallholder farmers with approximately 62 percent of Kenya's total employable population, about 28 million, either directly or indirectly depend on agriculture for their livelihood. This includes farmers and off-farm employment related to agriculture such as agri-businesses (UNECA, 2020). Out of the 28 million, about 32 percent are said to be farmers with informal employment taking up a larger percentage of the share, about eight times the share of the formal employment. Despite all these, agriculture employment growth rate has been low, averaging 2.3 percent (GoK, 2018b). Therefore, to be able to transform the sector to create green jobs, there is a need to transform the sustained behavior of the smallholder segment of the sector.

¹⁵ Kenya National Bureau of Statistics (KNBS)

Energy Sector Employment status and social well being

With respect to energy, the 2020 UNECA report revealed that the wage employment of the energy sector has been relatively steady at one percent of the total economy, with employment in the public sector steadily standing at 5 percent of total energy labor force. However, decentralized renewable energies have created 10,000 direct jobs and 15,000 indirect jobs in 2017/2018 with women and youth accounting for 23 percent and 41 percent respectively of direct jobs (UNECA, 2020). This is estimated to grow to 17,000 direct jobs and 30,000 indirect jobs by the year 2023 depending on mini-grid penetration, a 70 percent increase. The top three skills from 10,000 direct jobs were sales and distribution at 41 percent, management and business administration at 22 percent and after-sale services at 15 percent. This trend is expected to change by 2023 with sales and distribution dropping to 38 percent, management and administration increasing to 24 percent and after-sale service remaining the same at 15 percent (Power4All, 2019).

Manufacturing Sector Employment status and social well being

With respect to manufacturing, the 2020 UNECA report noted that the wage employment of the manufacturing sector stands at 11 percent of the total economy, a slight drop from 2014 period's figure of 12 percent with employment in the private sector steadily at 91 percent of total manufacturing labor. As at 2017, the UNECA 2020 report further stated that informal employment in manufacturing was 2.8 million, which is about 8.2 times more than total manufacturing wage employment for the same period. This clearly outlines the reliance of the sector on the informal economy for purposes of driving its growth (KNSB, 2020). Informal employment in the sector has been growing at 3X the rate of formal employment. However, there is an overall drop in labor productivity from an overall two percent annually to three percent since 2013 (UNIDO, 2010). This can be attributed to the sector's skill mismatch from poor linkages between training institutions and the sector.

Waste Sector Employment status and social well being

With respect to waste management, the 2020 UNECA report noted that the wage employment of the waste sector was relatively steady at one percent of the total economy with a peak from 0.4 percent in 2014. The employment in the private sector is approximately 13 percent of total waste management labor. This is because of the informal nature of the sector's private businesses and the majority of the waste pickers, where the bulk of employment features (UNECA, 2020). More so, these informal waste pickers are grossly underpaid and work under dangerous conditions without much, if any, legal protection, health or safety equipment. The lack of training and learning opportunities make innovations and improvement difficult in this sector.

2.5 Policy and Legal Pillars of Circular Economy in Kenya

Kenya Vision 2030 – the country's development blueprint – recognized climate change as a risk that could slow down the country's development agenda. To be able to respond, the country must embrace climate change mitigation and adaptation. Adoption of green and circular economy business practices is one of the proven ways of adapting and mitigating the climate change challenges. The country's 3rd Medium Term Plan MTP III (2018-2022) recognizes climate

change as across-cutting thematic area and should be mainstreamed into climate change actions of different economic sector plans. MTP III recognizes opportunities for public-private partnerships (PPPs) to help stimulate the growth for purposes of delivering on the vision as well as the MTP itself¹⁶.

Kenya's NDC under the Paris Agreement of UNFCCC includes mitigation and adaptation contributions. In regard to adaptation, "Kenya will ensure enhanced resilience to climate change towards the attainment of Vision 2030 by mainstreaming climate change into the Medium Term Plans (MTPs) and implementing adaptation actions." The mitigation contribution "seeks to abate its GHG emissions by 30% by 2030 relative to the BAU scenario of 143 MtCO₂eq." Achievement of Kenya's NDC requires investments both from public and private sector.

Kenya's National Climate Change Policy Framework (NCCPF) aims to ensure the full integration of climate change considerations into planning, budgeting, implementation as well as decision-making at the National and County levels and across all economic sectors. NCCPF aims to promote private sector involvement in climate change responses through specific policy interventions, among them, the development of targeted policy and fiscal incentives to help promote private sector involvement in low carbon and climate resilient development pathways.

Kenya's National Climate Finance Policy (NCFP) promotes the establishment of legal, institutional and reporting frameworks to help access and manage climate finance. The goal of this policy is to further Kenya's national development goals through enhanced mobilization of climate finance that contributes to low carbon climate resilient development goals. One of the objectives of the policy is to encourage private sector participation in climate relevant financing opportunities. The Policy recognizes the critical role of the private sector in implementing green actions and in investing in low carbon and climate resilient development pathways. Additionally, the policy aims to identify legal and regulatory barriers for private sector and financial sector low-carbon and climate resilient investment, and promotes solutions designed to address them. The policy aims to develop a strategy to monitor and track uses of climate finance by various actors including private sector so as to enhance integrity while also eliminating corrupt practices.

The Climate Change Fund (CCF) established under the Climate Change Act, 2016 aims to provide financing mechanisms to priority climate change actions and interventions by both public and private sector. The draft Fund regulations aim to operationalize the Fund. The private sector is expected to play an active role in the Fund including provision of resources as well as accessing the resources from the Fund. The operationalization of the fund is yet to be actualized.

Kenya's National Climate Change Action Plan (NCCAP) is a five-year plan that aims to further Kenya's development goals in a low carbon climate resilient manner. The plan sets out adaptation, mitigation and enabling actions with a vision for low carbon and climate resilient

¹⁶UNDP, 2019. Private Sector Engagement and Coordination Framework for the Implementation of the National Climate Change Action Plan for Kenya

development. The NCCAP also serves as the implementation framework for Kenya's nationally determined contributions (NDCs). The First NCCAP was for the period 2013-2017 and the second NCCAP for the period 2018-2022. The NCCAP recognizes that support and action of the private sector is needed so as to achieve climate change goals and implement the action plan. This recognition included prominent role for Private sector in the development of the NCCAP.

The objectives of the *Kenya Climate Smart Agriculture Strategy (KCSAS)* are to adapt to climate change and build resilience of agricultural systems while minimizing greenhouse gas emissions. The actions will lead to enhanced food and nutritional security and improved livelihoods. The Green Economy Strategy and Implementation Plan (GESIP) 2016 – 2030 seeks to enable Kenya achieve a low carbon, resource efficient, equitable and inclusive socio-economic transformation.

The *Climate Change Act (No. 11 of 2016)* is the first comprehensive legal framework for climate change governance for Kenya. It therefore opens opportunities for innovative green and circular economy business models. The objective of the Act is to “Enhance climate change resilience and low carbon development for sustainable development of Kenya.” The Act establishes institutional framework including a high level Climate Change Council (CCC) where the private sector is represented in climate change coordination. It also establishes the Climate Change Directorate (CCD) to be solely responsible for climate change issues in the country.

The Act sets out provisions for public consultation, and provides incentives and obligations for the private sector's contribution to low carbon climate resilient development. The Act provides for the setting up of greenhouse gas emission reduction targets, and sets out obligations for measuring reporting and verification of the same emissions.

CHAPTER THREE: CIRCULAR ECONOMY ACTION AND INTERVENTION AREAS

3. The Circular Economy Action Areas

The Key areas for Circular Action are as shown in Figure 28 below.

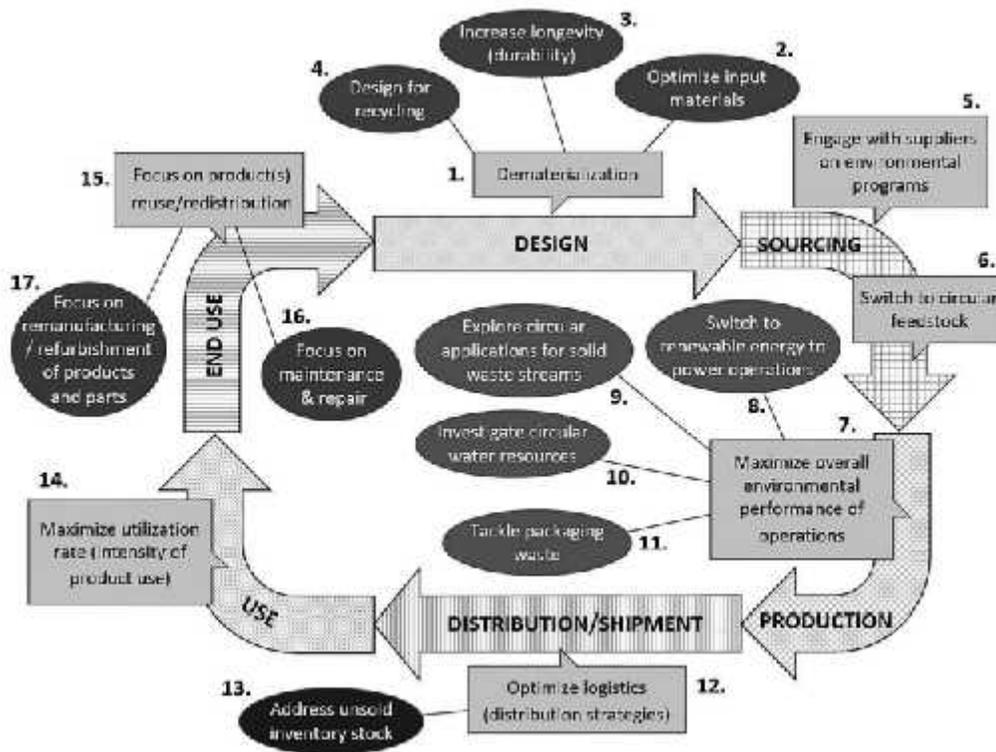


Figure 28: The Key Areas of Circular Economy
Source: Tonelli & Cristoni, 2019

The CE Action Areas include:

Material Flows. An in-depth understanding of the flows of all substances and materials entering the company is crucial to fully assess the consequences of implementing circular material management in business operations. For example, there might be resources whose global reserves are predicted to be depleted soon and thus need to be preserved through closed-loop operations¹⁷. Or, the company might realize that there are a high number of toxic substances used in production and therefore the best strategy would be to focus on identifying suitable bio-based alternatives.

Waste Flows. Apart from the typical waste generated at the site level (resource waste), a comprehensive waste flow analysis can be intended to look at the broader picture and include at least two additional categories (Lacy and Rutqvist 2015): wasted lifecycle and capacity waste.

¹⁷Winkler, H. 2011. "Closed-Loop Production Systems—A Sustainable SupplyChain Approach." CIRP Journal of Manufacturing Science and Technology 4: 243–46.

The former occurs when the lifecycle of a product is not maximized to its full potential through, for example, design for durability or product life extension interventions. Capacity waste arises if the physical utilization rate of a product is not 100%, which occurs, for example, when a car carries only one passenger or if it remains parked for long periods of time.

3.1. Key areas of intervention for a Circular Business

Where should a company need to intervene in order to make this green and circular transition possible. Given that there is no one-size-fits-all mode of intervention, each of these different interventions are likely to be addressed differently depending on the prevailing local context (Tonelli & Cristoni, 2019).

- **Innovative Circular Product Designs**

Innovative, groundbreaking design principles stand at the root of the CE system. With the realization that the intrinsic value of today's products is not being properly exploited and that customers demand greener solutions that lower the pressure on the natural environment, innovative approaches to product design are rapidly emerging as valid alternatives to old-fashioned ideas. There are at least three broad approaches to circular design that a firm can pursue: green design, design for durability, and design for reverse cycles.

- **Eco-design/Green design** is an umbrella term comprising different approaches to product design¹⁸ that seek a reduction in environmental and health impacts associated with product manufacturing. Because of its broad definition, green design can occur at various levels and lead to the following:
- **Reduced or replaced highly toxic substances:** Phasing out toxic substances is the key to a CE as they cause harm to both the natural environment and the human health. Today, a considerable number of bio based substitutes and Internet-dedicated portals exist, thereby making it easier for companies to address toxicity of their products. Replace technical inputs with environmentally neutral biological alternatives that can be safely returned to the biosphere. An example of this is replacing plastic packaging with biodegradable
- **Substitutes.** Reduce demand or replace natural inputs and/or scarce earth resources, possibly by applying light weighting or dematerialization design principles. Both approaches aim at using as little resources as possible in the production of an item, thereby reducing its material intensity. To achieve this, designers look at ways to produce smaller and lighter products or replace goods with non-material substitutes (e.g. MP3 technology superseding CDs). Evidently, these design strategies work best when materials play a key role in the overall environmental impact of a product or when there is major transportation involved (e.g. heavier vehicles produce more emissions).

18 Waste Management (WM). 2014. "Design with Intent: Sustainability in Product Design."

- ***Design for durability*** is particularly important for the increasing number of businesses switching from selling products to offering services (i.e. servitization), as they need to devise goods that can last the longest possible and remain attractive to customers over time. The key principles of design for durability are:
 - i. Understanding the appropriate product lifetime, also by considering how repair and recycling fit within the overall product life cycle(s);
 - ii. Devise parts, components, and connections that are robust, wear-resistant, and durable by deploying high-quality materials and by reinforcing those parts that are most weak;
 - iii. Promote maintenance by striving to create products that can be easily maintained and preserved by providing clear instructions, tools, and spare parts and by offering low-cost repairing services;
 - iv. Stay ahead of the fashion curve by choosing classic/timeless designs and by enabling customers to make use of the products in different settings and occasions.

- ***Design for reverse cycles***. According to linear thinking, products are devised – at times purposively – to last for a very limited time. Additionally, no emphasis at all is placed on how the intrinsic value of an outdated or discarded good can be harnessed and kept within the economic system. In this way, the value creation process is abruptly interrupted with the destruction of the item through incineration or its disposal in landfills.

On the other hand, a circular mentality allows us to see the advantages of making product recovery solutions accessible and more efficient. This means, for example, designing product components that can be dismantled and re-assembled more easily, which, in turn, has to do with minimizing the number of connections and using simple tools, decreasing the overall number of a product's parts, simplifying its structure, and finally using materials that are more suitable for sorting and disassembly – such as ferromagnetic materials. Ink cartridges returned to HP facilities now get disassembled and separated into different materials. The plastics are then processed and mixed with plastics from other sources to create the inputs for new cartridges. Another way to embrace design for reverse cycles is to develop products whose materials can be recycled more easily. Autodesk Sustainability Workshop provides key insights into the core pillars of design for recycling: reducing at a minimum the number of materials used, trying not to combine materials that cannot be separated easily, simplifying the removal of toxic and dangerous components, and choosing materials that are universally recyclable.

- **Reverse Cycles:** This entails establishing and managing one or multiple flows of materials, components, and/or products from the moment they get damaged, broken, or discarded to their re-valorization and further re-introduction into the economic system through repair, re-use, refurbishing, remanufacturing, or recycling. Thus, a company focusing on reverse cycles will be implementing actions aimed at collecting its used products and then establishing effective post-value channels whereby items get processed

according to the new function they will serve. The key circular activities linked to this specific area of intervention are presented below:

- **Repairing** is the practice of getting damaged or broken product's components back to a useful state. Instead of seeing repair programmes as a threat to bottom line profits, circular-oriented companies allow customers to get damaged goods repaired within 30 business days. Such companies can team up with iFixit apps to help provide easy-to-follow online guidelines for self-repairing of damaged items. CE firms focusing on repair activities are able to continue being profitable by exploiting their marketing and branding knowledge to increase market share and generate customer loyalty in the face of premium pricing (Bocken and Short 2015).
- **Re-using** is about giving a second life to a product, which invariably means finding a second market for it or using it for a different purpose (e.g. input to produce another item). Leveraging innovative trading platforms is a simple way for businesses to start tackling their excess inventory stocks and unused items. In the U.S., General Motors backed the creation of the "Reuse Opportunity Collaboratory Detroit (ROC Detroit)" programme in which one organization's unused materials and products are advertised on a dedicated data base and traded according to the needs of other members. The programme helps Detroit businesses unlock the potential behind re-using: costs are reduced as cheaper feedstocks are available, disposal fees decrease, the overall impact of procurement on climate change lessens, and local development is fostered, as well as the reputation of member organizations (Tonelli & Cristoni, 2019).
- **Refurbishing**, as defined by the Ellen MacArthur Foundation, consists in "returning a product to good working condition by replacing or repairing major components that are faulty or close to failure and making cosmetic changes to update the appearance of a product, such as changing fabric or painting". Because of the steps and costs involved, refurbishment is generally an activity best suited for complex goods and machinery. In the Netherlands, for example, Philips runs a refurbishment facility where a variety of pre-owned healthcare systems – magnetic resonance imaging, interventional X-ray technologies, surgery, and computed tomography equipment – undergo a series of repair processes, renewed components, and latest software updates, before being resold with full warranty (Tonelli & Cristoni, 2019).
- **Re-manufacturing** differs from refurbishing for it focuses on the disassembly of discarded assets and the re-valorization of their functioning parts. Reusable components are removed from the used product and assembled into a new one. Changes or improvements can also take place during this phase, and the full process is usually performed according to specific quality assurance criteria. Re-manufacturing activities are usually carried out in dedicated re-processing centres only after products have been inspected, triaged, tested, and graded (Diallo et al. 2016). Caterpillar's re-manufacturing programme, Reman, for example, is highly specialized in processing parts and

components of engines, drivetrains, hydraulics, and undercarriages, assuring customers that its re-manufactured substitutes deliver the same performance of new products at a fraction of the costs.

- **Recycling** is the process of breaking down discarded products into their base materials and convert them into new products. Historically, recycling has been mainly associated with **consumer and household materials like paper, glass, and plastic**. More recently, the development of newer and more efficient technologies and the enhanced focus on re-capturing the residual value of products have contributed to expand recycling activities into previously unexplored settings, like chemicals and clinical waste. When leveraging reverse cycles as a preferred area of intervention, it is paramount to establish an effective customer engagement programme for the take-back of used products, particularly with respect to those products that consumers are not accustomed to recycling when they brake or become old-fashioned. There are a variety of strategies that companies can employ to help trigger collaboration from their customers:

3.2. Green Internal Operations

When the environmental impact of a company is largely dependent on the performance of its own sites and internal operations, principles of circularity can be leveraged to gradually reduce environmental externalities like:

- **Greenhouse gas emissions** often directly or indirectly (i.e. electricity) caused by the burning of fossil fuels. Google, for example, in 2016 announced that it would have acquired enough renewable energy to match 100% of its operations by the end of 2017. Looking ahead, Google is now raising the bar of its sustainability commitment as it intends to power its operations on a region-specific, 24×7 basis with clean zero-carbon energy (Tonelli & Cristoni, 2019).
- **Water use and pollution**. Several alternatives allowing the re-use of both storm water and greywater exist today: industrial re-use of reclaimed water derived from treated municipal effluent; individual on-site re-use systems and greywater re-use; LEED-driven on-site storage and use of rainwater and greywater through water harvesting; and storm water harvesting and use (Tonelli & Cristoni, 2019).

3.3. Supplier Engagement

The supply chain is where most opportunities exist to leverage circular solutions and re-investment processes. Some forward-looking multinationals like Ford are already taking steps to support their suppliers in addressing environmental issues while introducing CE practices. Ford created the “Partnership for A Cleaner Environment” programme (PACE) to help business partners address energy, water, air pollution, and waste challenges, by providing a toolkit of practical solutions and best practices already internally tested and proven at Ford’s plants (Tonelli & Cristoni, 2019). In the UK, following its commitment to eradicate food waste surplus in the country, grocery and merchandise multinational retailer Tesco announced in March 2017

the launch of “Food Waste Hotline”, an online portal that business partners can use to report surplus stocks of food to Tesco Product teams and work with them to take appropriate actions. It is important to note that acting at the supply chain level can also imply a broader re-structuring of both internal operations and relationships with business partners, most notably if reverse cycles for product recovery are established. To effectively invert flows of materials and/ or goods, companies might be required to expand the boundaries and scope of their sourcing activities, going well beyond business-as-usual.

CHAPTER FOUR: DESIGNING GREEN AND CIRCULAR BUSINESS MODELS

The shift to a circular economy requires companies to rethink not only their use of resources but also to redesign and adopt new business models based on dematerialization, longevity, refurbishment, remanufacturing, capacity sharing, and increased reuse and recycling¹⁹. These different business models can be illustrated in what is popularly referred to as “Value Hill”, Figure 29.

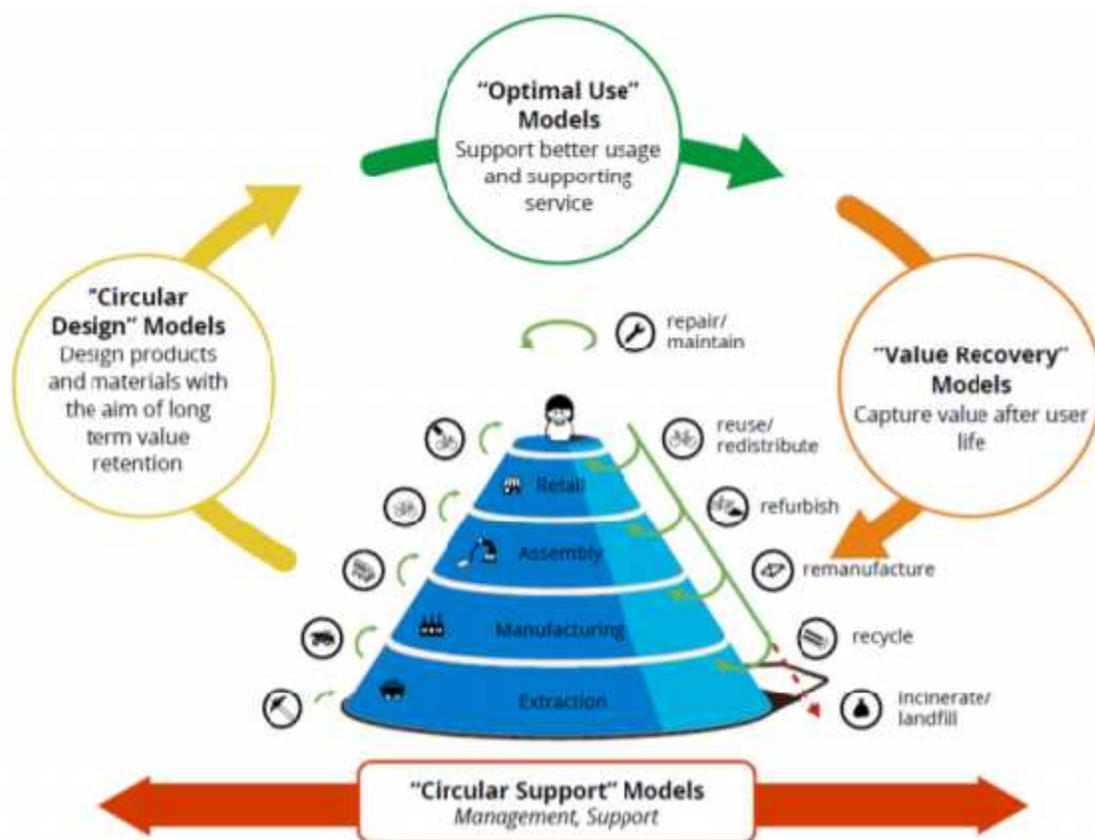


Figure 29: Circular Business Model in the Value Hill

Source: EIB, 2020

19 European Investment Bank (EIB), 2020. The EIB Circular Economy Guide – Supporting the Circular Transition

Source: Elisa Achterberg, Jeroen Hinfelaar, Nancy Bocken, “The Value Hill Business Model Tool: identifying gaps and opportunities in a circular network” (2016)

Circular design models focus on the development of existing or new products and processes that seek to optimize circularity. Products are designed to last longer and/or be easy to maintain, repair, upgrade, refurbish, remanufacture or recycle (EIB, 2020). Further, new materials can be developed and/or sourced, e.g., bio-based, less resource-intensive, or fully recyclable products.

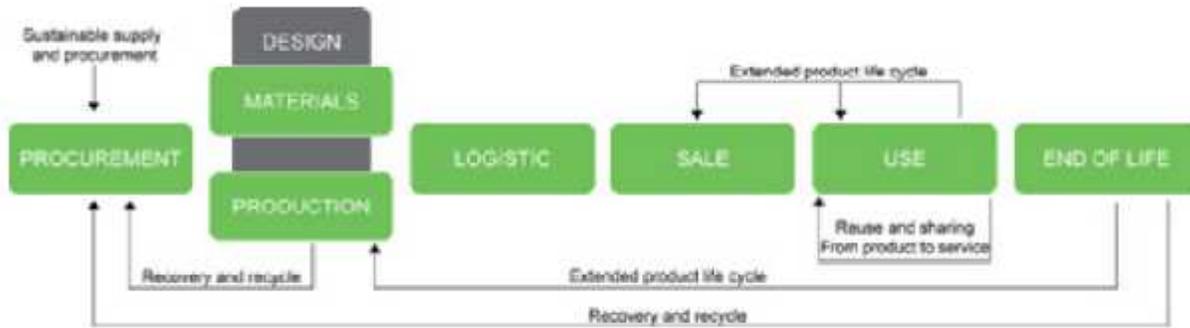


Figure 30: The design process for circular products development
Source: Italian Ministry of Economic Development, 2017

Optimal use models aim to increase the value and use of a product during an extended life. These business models often build on retained ownership of a product, e.g. by providing a service rather than selling a product, and/or taking responsibility for the product throughout its useful life, e.g. through maintenance services, or add-ons to extend the life of a product (EIB, 2020). Such product-to-service models have financial implications coming from, for instance, the changing nature of cash flows, with increasing working capital to pre-finance clients, balance sheet extension, and re-evaluation of residual value (EIB, 2020). Related challenges lie in product tracking and legal issues surrounding ownership of collateral and its value (EIB, 2020). Such risks may be difficult to assess or value, and could lead to difficulties in financing this type of projects.

Value recovery models focus on maximizing recovery and recycling of products and materials after use into new products or useful resources in order to reduce wastage and conserve resources (EIB, 2020). The development of reverse logistics, i.e. the return from point of consumption to point of production, is essential for this model (EIB, 2020). It needs to be considered that for some materials, recycling involves a loss of quality and for products also loss of design, and technical and energy inputs. By acknowledging this, a difference can be made between down cycling, which results in lesser quality and reduced functionality, and upcycling, which involves transforming by-products and waste into new materials or products of higher quality or better environmental value (EIB, 2020).

Circular support models focus on the management and coordination of circular value networks and resource flows, and optimizing incentives and other supporting activities in a circular network (EIB, 2020). Circular support models also include the development or deployment of key enabling technologies supporting, enabling and facilitating the other business models (EIB, 2020).

All 14 circular categories listed below contribute to increasing resource efficiency, and they decrease environmental impacts throughout value chains (EIB, 2020). A project is considered to be substantially contributing to the circular economy if it falls under the circular economy categories (EIB, 2020) described below:

Group 1 - Circular design and production models

- 1.a Design and production of products and assets that enable circular economy strategies, through e.g. (i) increased resource efficiency, durability, functionality, modularity, upgradability, easy disassembly and repair; (ii) use of materials that are recyclable or compostable*
- 1.b Development and deployment of process technologies that enable circular economy strategies*
- 1.c Development and sustainable production of new materials (including bio-based materials) that are reusable, recyclable or compostable*
- 1.d Substitution or substantial reduction of substances of concern in materials, products and assets to enable circular economy strategies*
- 1.e Substitution of virgin materials with secondary raw materials and by-products*

Group 2 - Circular use models

- 2.a Reuse, repair, refurbishing and remanufacturing of end-of-life or redundant products, movable assets and their components that would otherwise be discarded*
- 2.b Refurbishment and repurposing of end of design life or redundant immovable assets (buildings/infrastructure/facilities)*
- 2.c Product-as-a-service, reuse and sharing models based on, inter alia, leasing, pay-per-use, subscription or deposit return schemes, that enable circular economy strategies*
- 2.d Rehabilitation of degraded land to return to useful state and remediation of abandoned or underutilized brownfield sites in preparation for redevelopment*

Group 3 - Circular value recovery models

- 3.a Separate collection and reverse logistics of wastes as well as redundant products, parts and materials enabling circular value retention and recovery strategies*
- 3.b Recovery of materials from separately collected waste in preparation for circular value retention and recovery strategies (excluding feedstock covered under 3.c)*

- 3.c *Recovery and valorisation of separately collected biomass waste and residues as food, feed, nutrients, fertilizers, bio-based materials or chemical feedstock*
- 3.d *Reuse/recycling of wastewater*

Group 4 - Circular support

- 4.a *Development/deployment of tools, applications and services enabling circular economy strategies*

New Models to Accelerate Green and Circular Economy

Pursuing the principles of circular economy represents an opportunity to create new business models (Figure 14). In order to evaluate the possible solutions, it is necessary to move from a linear approach to a circular approach, sometimes questioning the business models pursued up to now and confronting the new market demands.

4. Designing Out Negative Externalities

4.1. Life Cycle Assessment (LCA)-

LCA is a methodological approach used to identify and measure all the environmental impacts (resource and energy consumption, emissions, and waste) associated with a product or service along its entire life cycle (i.e. from cradle – raw material extraction – to grave – the disposal stage) (Tonelli & Cristoni, 2019). As such, LCA is useful to compare different alternatives, as well as evaluate what is already on the market. Since 1997, the LCA method has been formalized by the International Organization for Standardization through a series of documents (the so-called “ISO 14040 family of LCA standards”) that have played a central role in consolidating the procedural processes, generating widespread acceptance by the international community. Roll out of the LCA is achieved through four iterative phases.

It commences with a definition of the aim and boundaries of the study (Phase 1: Scope and goals definition), aspects that will guide the development of the assessment process until results can be drawn and communicated to all interested parties. This stage also determines “the functional unit” of analysis, i.e. the product reference to which inputs/outputs and impacts will be related to. Phase 2 is about identifying relevant inputs and outputs (Phase 2: Inventory analysis). Inputs will include all natural resources (water, energy, and raw materials) consumed to produce, use, and dispose of the functional unit. Outputs refer to emissions generated throughout the product/service life cycle and absorbed by air, water, and soil. The third phase is about evaluating the potential environmental and health implications linked to those emissions as well as resource use (Phase 3: Impact assessment). This is accomplished by translating the results of the previous phase into a set of indicators linked to selected impact categories (e.g. global warming, ozone depletion, etc.). Finally, results are interpreted to derive conclusions, limitations, and recommendations that will form a solid base for discussion about ways in which the product’s ecological footprint can be mitigated through direct interventions along the value chain, or by choosing alternative solutions (Phase 4: Interpretation) (Tonelli & Cristoni, 2019).

But the application of LCA is not limited to products. It can also help compare standard business operations with circular alternatives, thus enabling a company to innovate quicker and allocate investments more effectively (Tonelli & Cristoni, 2019). With specific regard to wastemanagement, studies have recently attempted to examine the potential benefits of implementing waste biorefinery solutions in developing countries²⁰, given their capacity to use biomass waste from a variety of industries (like forestry, agriculture, pulp and paper, and food) to produce transportation biofuels, power, and chemicals. In such a context, LCA has been proposed as a valuable decision support tool to identify the most suitable biorefinery technology (e.g. fermentation, anaerobic digestion, pyrolysis, incineration, or gasification)(Nizami et al. 2017).

4.2. Life Cycle Costing (LCC)

LCC helps to calculate the total costs of a product or service along its entire life cycle. Although it originated as a tool for financial analysis, more recently LCC has proved a valuable resource to support the integration of green solutions at the design stage of product development (Bradley et al. 2018) as well as during procurement. Environmental LCC can in fact be used to calculate the whole spectrum of costs associated with managing the ecological impact of a product, from the acquisition of licences and permits to waste management costs, from charges for product/material disposal to even the investments made to set up a dedicated environmental management system (EMS) or conduct LCA studies. The real value of LCC consists in its ability to include the widest possible range of environment-related costs, including those not directly bore by the manufacturer. Total Costs of Ownership (TCO) – consisting of purchase price, operating costs (including energy and water use), and end-of-life expenses – can be accounted for, as well the societal costs (e.g. pollution, waste, health damages, etc.) linked to the environmental externalities produced by the product or service (ISO 20400:2017).

4.3 Eco-design

The EU defines Eco-design as, “The integration of environmental aspects into the product development process, by balancing ecological and economic requirements. Eco-design considers environmental aspects at all stages of the product development process, striving for products which make the lowest possible environmental impact throughout their entire product life cycle”. It has been estimated that 80 percent of the environmental impact of a product over its life cycle is determined before that product leaves the drawing board. This gives the designer a huge opportunity to design out environmental problems before they even exist. Eco-design strategies are multiple and encompass various interventions throughout the life cycles of a product/service. Strategies such as design for environment, design for modularity, design for recycling (design for material recovery), design for reuse, design for reliability, design for maintainability, and design for end-of-life allow companies to increase the sustainability and circularity of their products to limit their impact on the environment in the various life-cycle phases (Design4Circle, 2019). Seen from the circular economy perspective, eco-design can take any of the forms described below:

²⁰ Nizami, A. S., M. Rehan, M. Waqas, M. Naqvi, O. K. M. Ouda, K. Shahzad, R. Miandad, et al. 2017. “Waste Biorefineries: Enabling Circular Economies in Developing Countries.” *Bioresource Technology* 241: 1101–17

4.4 *Design out waste /Design for Zero Waste*

A circular economy aims to design out the negative impacts of economic activity that cause damage to human health and natural systems. This includes the release of greenhouse gases and hazardous substances, the pollution of air, land, and water, as well as structural waste such as traffic congestion. In a circular economy, waste is regarded as a product of bad design²¹. Traditionally, waste has always been considered a necessary evil of production. Today, we are seeing a shift from this point of view to, cradle-to-cradle thinking, in which waste is designed out and everything that was ever made has to return either to nature or to the industry without damaging the environment (Design4Circle, 2019). For the textile industry, this strategy encourages designers to minimize and even eliminate the waste that is created, both pre and post-consumer. It includes zero waste pattern cutting, recycling or reusing leftovers, on demand design or 3D virtual prototyping (Design4Circle, 2019).

- ***Design for Circularity.*** In a circular economy, all products should be designed so as to be either biodegradable, recyclable or a combination of both (by separating individual parts). Through recycling, all materials and components in a product are recovered for use in new products or processes (Design4Circle, 2019). Design for recycling, Design for mono-materiality or Design for disassembly are necessary approaches to allow for future cycling of the materials.
- ***Design for zero toxicity.*** In order to minimize the risk for any harmful compounds to be released into our environment, it is crucial to design products that are 100 percent safe and effective to both biodegrade or incinerate (Design4Circle, 2019).

4.5 *Design for energy and resource efficiency.*

Energy consumption and water usage for example in the textile industry is extremely high and occurs at each stage of the lifecycle of textiles – at the production stage, in the use phase (where consumers use and care for textiles and garments) and at the end stage (which covers either disposal and/or re use of the material). In this strategy, design choices are made to reduce energy and resource consumption. Production phase examples include in the use of dry patterning systems, Air-dyeing. In the use phase, alternatives such as design for no/low laundering, or technical coatings to reduce washing could be adopted (Design4Circle, 2019).

Additionally, we need to also develop standards for the design of products. Such Standards for recycled materials do exist in several countries. However, there are opportunities to expand the use of standards at the design phase of products. This implies developing standards that require designing products that are durable, make use of secondary materials, and are easy to repair and/or recycle. For example, the European Union's (EU) Eco-design Directive sets minimum mandatory energy efficiency requirements for products such as household appliances. It outlines outcomes to be achieved while allowing EU member states to choose implementation

²¹ Design4Circle, 2019. Circular Economy in the Textile and Footwear Industry: Skills and Competences for a Sector Renewal

measures²² (European Parliament, 2009). Products that are designed to facilitate reuse and recycling become the starting point of an effective secondary materials recovery. The need to use resources more efficiently calls for a change in the traditional development of our current economic model, which is based on the linear approach of “take, make, consume, dispose” (EU, 2017). This model relies on highly available and cheap resources, which, with those resources disappearing quickly, is no longer valid. A circular economy keeps the value of products, materials and resources in the economy for as long as possible and eliminates waste (EU, 2017). The following actions have helped the EU successfully embrace the circular Economy (EU, 2017):

- Reducing the quantity of materials required to deliver a particular service (light weighting)
- Lengthening products’ useful life (durability)
- Reducing the wasteful use of energy and materials in production and use phases (resource use efficiency)
- Reducing the use of materials that are hazardous or difficult to recycle in products and production processes (substitution)
- Creating markets for secondary raw materials (recyclables) materials (based on standards, green public procurement, etc.)
- Designing products that are easier to maintain, repair, upgrade, remanufacture or recycle (eco-design)
- Developing the necessary services for consumers in this regard (maintenance/ repair services, etc.)
- Incentivizing and supporting waste reduction and high-quality separation by consumers
- Incentivizing separation collection systems that minimize the costs of recycling and reuse
- Facilitating the clustering of activities to prevent by-products from becoming wastes (by-product exchange through industrial symbiosis)
- Encouraging wider and better consumer choice through renting, lending or sharing services as an alternative to owning products, while safeguarding consumer interests (in terms of costs, protection, information, contract terms, insurance aspects, etc.)

4.6 Green Standards and Certifications

The lack of credible information and standards about the quality of the recycled materials can also hinder their use in the production processes. Consumers too may not be confident to purchase refurbished and remanufactured products in the absence of credible information on their quality and performance. Strict adherence to standards will assure this. There is therefore need to develop standards that will guide the use of secondary materials. They should be developed to guide the reuse of secondary raw materials so as to address concerns regarding

²² European Parliament (2009) Directive 2009/125/EC of the European Parliament and of The Council of 21 October 2009: Establishing a framework for the setting of ecodesign requirements for energy-related products

quality, ensure safety and enable greater uptake by prospecting industries²³. In the absence of formal standards, industry-wide benchmarks can play a similar role. Industry associations can play a key role in developing and propagating the adoption of such standards and benchmarks. Governments can collaborate to help harmonize quality standards so as to enable cross-border secondary material flows (Ghose & Kapur, 2019). Along with standards, credible certification schemes should be designed for secondary raw materials and resource efficient products to help improve confidence among potential users of these materials and/or products (Ghose & Kapur, 2019). Certification schemes can also ensure that the recycling facilities apply relevant health, safety and environmental standards.

4.7 Eco-Labels

There is need to increase information about environmentally benign products through the use of green labels. Such green labels have been shown in the developed world to influence consumer choices. A credible regime of green certification can help engender greater trust in the claims of the green product (Ghose & Kapur, 2019). Environmentally friendly labels called eco-labels are normally used to guide the consumer in making informed choices as regards the purchasing of environmentally friendly products. There are several types of green labels. The most preferred is the one that requires third party verification as a sign of guarantee. Green marketing based on the use of eco-labels requires massive consumer awareness raising sessions. It will also be important to guard against the proliferation of false claims, a concept popularly referred to as green washing.

4.8 Sustainable Supplies or Purchases

The ability to provide supplies of resources totally coming from renewable sources, from re-use, and from recycled, recyclable or biodegradable materials and which are themselves based on circular production chains for the production and consumption aspects. This model allows to push the market demand towards a lesser use of non-renewable and sometimes scarce resources, as well as reducing waste quantities by removing system inefficiencies. It is a model that already enjoys advantages for suppliers to Government institutions, thanks to the green public procurement (GPP) framework as well as the Minimum Environmental Criteria (MEC) that can be introduced for some commodity sectors.

4.9 Resource Recovery Lifecycle Extension of Resources

This model is based on the ability of a company to withdraw a product at the end of its life cycle in order to re-use it. The re-use can involve some components or the whole product as a result of a maintenance phase (if necessary). This is a business model that promotes the return of resource flows and transforms potential waste into value through innovative reuse and / or recycling services.

²³Ghose, J., & Kapur, S., 2019. Policies and Practices to enable Business Models for Resource Efficiency and a Circular Economy

4.10 Industrial Symbiosis

Circular economy requires actions throughout the life cycle of materials aiming at closing material cycles and at resource use efficiency. It is no longer just “recycling economy”, but the focus is on the whole value chain involving a plurality of public and private actors and stimulating virtuous processes of cooperation and new business models. There is need for geo-referenced and shared data platform that aids in identifying potential matches among SMEs. The circular economy, involves connecting traditionally disconnected industries into an integrated system that aims to promote their competitive advantages through the exchange of materials, energy, water, and / or by-products. The benefits are economic, environmental, and social for the whole territory involved.

Industrial symbiosis is a tool for eco-innovation of the system, for the efficient use of resources, and involves dissimilar companies through the creation of green networks of resource sharing. The networks are also based on appropriate platforms for meeting demand and offers and to make known the characteristics of residues, in order to carry out evaluations and investigations on the possibilities of their use in new production processes, addressing the problems related to the exchange of confidential information and technical know-how. With regard to industrial symbiosis, it is necessary to set up an organic and systematic portfolio of economic instruments in support of companies in their development processes, with specific emphasis to overcoming critical factors and fully exploiting new opportunities.

4.11 Extension of Product Life

This business model is based on the marketing of products designed for longevity. The design phase of the product, even applying the principles of modularity, is essential to provide for and facilitate maintenance and replacement of its components, the updating of its functions and in some cases its aesthetic restyling. Several cases of companies at international level demonstrate how this model, when applied to certain types of products, is appreciated on the market because it also offers the possibility of additional free services such as maintenance / updating during use or replacement of the damaged product.

4.12 Sharing Platforms

Thanks to more advanced digitalization, in recent years there has been a multiplication of collaboration platforms between users of product groups, specific products, or ideas/proposals. A sharing that sees the active participation of individuals, public bodies, organizations, and businesses, which also create value through the dissemination of information.

4.13 From Product to Service Based Systems

A business model that in recent years has been adopted for cars, IT equipment, music and film streaming, sports equipment, etc. and is taking hold in other sectors such as clothing, furniture, gadgets, toys, and packaging. With this model, the products are not purchased but used by one or more users through the “pay-per-use” contract.

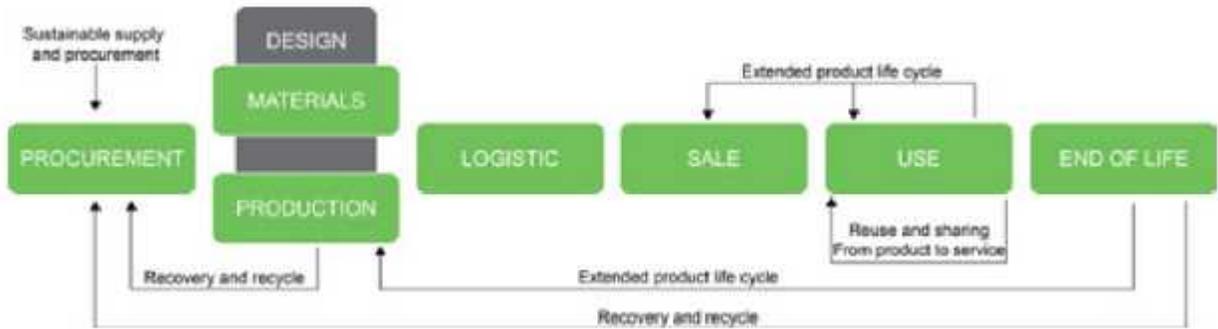


Figure 31: Circular approach for products and services development
 Source: Italian Ministry of Economic Development, 2017

4.14 Extended Producer Responsibility (EPR)

The Extended Producer Responsibility (EPR) is a strategy of environmental protection, adopted at the community level, to encourage the collection, recovery and recycling of some types of products, through the empowerment of communities by company product producers. The basic principle is precisely the extension of the manufacturer’s responsibility to take charge of the product once it has reached the end of its life, with the obligation to achieve specific percentages of recovery and recycling of its materials. The purpose of EPR is also to encourage producers to apply eco-design strategies during the product design phase, preventing the formation of waste and encouraging the recycling and reintegration of materials back into the outlet markets.

CHAPTER FIVE: MODELLING KENYA’S GREEN AND CIRCULAR ECONOMY PRIORITIES

5. Modeling Kenya’s Circular Economy

This framework adopts the modelling results of the 2020 EU sponsored country report for Kenya²⁴ on the socio-economic impacts of the country’s green and circular economy transformation. The aim of the exercise was not to forecast the future in 2030, but to explore the impacts that more increased circularity would have by 2030, were this to become a reality. The modelling of the macro-economic impacts of the circular economy (CE) transition in Kenya was carried out using the Cambridge’s Econometrics FRAME model that is an advanced input – output model, designed to enable the assessment of socio-economic and environmental effects of energy, environment, and other important economic sectors. A conventional difference-to-baseline approach was followed. The CE scenario is compared against a baseline (E3ME’s

24 Karcher, S.Y.; Wekesa, Z.W.; Waweru, J.K.; Käsner, S.; Desmond, P., K.; Smit, T.A.B; Hemkhaus, M.; Ahlers, J.; Van Hummelen, S.; Chewpreecha, U.; Smith, A. & McGovern, M. (2020) Circular economy in the Africa-EU cooperation - Country report for Kenya. Country report under EC Contract ENV.F.2./ETU/2018/004 Project: “Circular Economy in Africa-Eu cooperation”, Trinomics B.V., Tomorrow Matters Now Ltd., adelphi Consult GmbH and Cambridge Econometrics Ltd

standard projection up to 2030 for the Kenyan economy)²⁵, based on official published economic and energy forecasts in which no explicit assumptions are made about circular economy activity (i.e. ‘business-as-usual’ scenario), in order to compare outcomes between the two.

5.1. Scenario Design

FRAMES is designed for use in scenario analysis, evaluating the impacts of an input shock to a reference scenario. An input shock may be either a change in policy, a change in economic assumptions or change to a model variable. By comparing different scenarios, it is possible to assess the impact of a change in policies and/or economic assumptions. The following scenarios were modelled: a baseline (based on official published economic and energy-sector projections) – which does not explicitly assume a certain level of circular economy activities and a circular economy scenario that (assumes an ambitious uptake of the circular economy, in addition to the baseline scenario with the base year for the modelling being 2020 and the target year 2030). Five priority sectors were chosen for investigation namely waste, electronics, manufacturing, plastics, agri-food, and construction as expounded in Table 1 below:

Table 1: Circular economy activities and corresponding modelling inputs

Category	Circular economy activity	Modelling input	Input size
Waste Management	Improved waste collection rate	Increase in waste sector output	Increase from 50% to 95%
E-waste	Improved enforcement of e-waste trade restrictions Improved recycling of valuable materials in e-waste	Reduction in e-waste (i.e. electronics) imports	
		Investment in recycling sector to improve health & safety standards (50% funded by industry, 50% funded through public/ODA financing)	€20,000
		Share of recycling investment paid for by private and public sectors	50:50
		Exports of materials recovered from e-waste recycling	€2.2m
Agriculture	Prevention of food loss in agricultural supply chain through improved storage and logistic	Substitution of agricultural imports by domestic agricultural production	€309m
		Investment in storage and logistical capabilities	€85m
		Share of investment paid for by private and public sectors (50% funded by industry, 50% funded through public/ODA financing)	50:50
Circular Production	Increased use of recycled materials in industrial production	Electronics production: shift from virgin metals and plastics inputs to recycled inputs	20% of virgin inputs replaced by recycled inputs
		Plastics production: shift from virgin feedstock to recycled feedstock	25% of virgin inputs replaced by recycled inputs
		Construction: shift from virgin non-metallic minerals (glass, cement, sands, ceramics) to recycled minerals	10% of virgin inputs replaced by recycled inputs
		Agricultural production: shift from mineral	20% of mineral

25 Energy-Environment-Economy Global Macro-Economic (E3ME) is a global sectoral econometric model used to analyze long-term energy and environment interactions within the global economy and to assess short and long-term impacts of climate change policy

		fertilizers to organic fertilizers	fertilizer replaced by organic fertilizer
Plastics packaging	Increased use of recycled feedstock in plastics production, replacing virgin feedstock	Shift in plastics' intermediate demand: reduced purchases from chemicals sector, replaced by purchases from recycling sector	
Construction	Increased use of recycled minerals in construction, replacing virgin minerals (glass, cement, sands, ceramics)	Shift in plastics' intermediate demand: reduced purchases from non-metallic minerals sector, replaced by purchases from recycling sector	

Source: Karcher et al 2020

5.2. Economic impacts and benefits

The presented modelling results reflects differences between the CE scenario and the baseline by 2030, rather than the net effect of economic developments occurring between 2020 and 2030. The EU modelling suggests that circular economy activities in Kenya would have a positive impact on the Kenyan economy. By 2030, Kenya's GDP is projected to be around 0.5% higher in 2030 in the circular economy scenario compared to the baseline scenario (Table 2). In other words, this suggests that the Kenyan economy would be slightly larger as a result of increased circular economy activity than it would be in a 'business-as-usual' situation.

Variable	Absolute difference from baseline scenario by 2030 (€2019)	Relative difference from baseline scenario by 2030 (%)
GDP	+ €619m	+ 0.5%
Consumer	+ €77m	+ 0.1%
Investment	+ €226m	+ 1.0%
Exports	+ €34m	+ 0.2%
Imports	- €82m	- 0.8%
Price Level	-	- 0.1%

Table 2: Macro-economic impacts of the CE scenario

Source: Karcher et al 2020

5.3. Social impacts and benefits

Apart from the positive economic effects, the circular economy in Kenya would also have positive employment effects. Overall, a net increase in employment relative to the baseline scenario of around **0.15%** is projected, or approximately **46,000 additional jobs** compared to the baseline. Nearly all the additional employment seen in the CE scenario would be generated in the agricultural sector, which accounts for over a third of the net employment impacts seen in the modelling results. However, these impacts on agricultural employment should be interpreted with caution, due to a limitation in the modelling methodology. The employment impacts observed in the CE scenario reflect an implicit assumption that the additional output in domestic agriculture due to prevention of food losses is as labour-intensive as other forms of agricultural production, when in reality it is likely that this circular economy activity would be much less labour intensive than most agricultural production (Karcher et al 2020) (Figure 14).

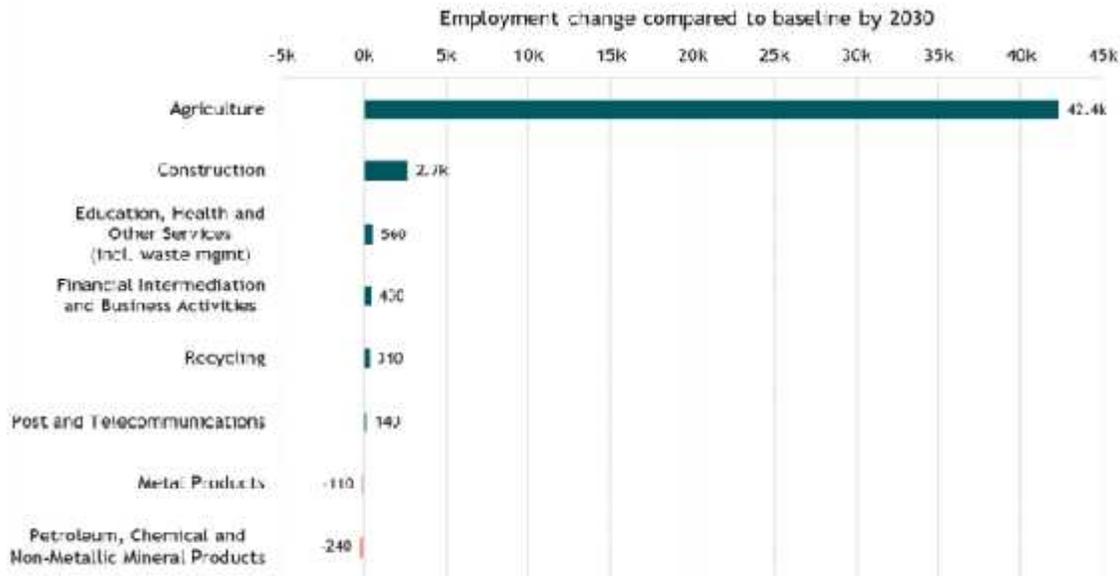


Figure 32: Absolute employment changes in selected sectors in CE Scenario (relative to the baseline scenario)
 Source: Karcher et al 2020

5.4. Environmental impacts and benefits

The modeling suggests that the economic growth seen as a result of circular economy activity in Kenya would produce higher carbon emissions than in the baseline, with CO₂ emissions forecast to be 0.16% higher than baseline levels by 2030. These results include only emissions of CO₂ from energy use (such as burning of fossil fuels in transport). They therefore do not take account of emissions of other greenhouse gases (such as methane), nor of emissions of CO₂ from other sources (including emissions from industrial processes, from changes in land use and from landfill). This is due to a lack of reliable data for these emissions at the sectoral level required in this study. As a result, the CE scenario emissions results do not fully capture the climate impacts of CE activities, in particular in the agricultural and waste sectors (Karcher et al 2020).

The recycling sector would see the largest rise in emissions as a result of CE activities, it sees greater demand for secondary products as inputs into construction and the production of electronics and plastics. This rise in emissions from the recycling sector would be offset, however, by a corresponding fall in emissions from the metals and petrochemical sectors that will shrink. The modelling results suggest that the net effect of this sectoral shift in output on CO₂ emissions would be fairly neutral (Karcher et al 2020). A smaller rise in emissions would be seen from the transport and power generation sectors, among the most energy- and carbon-intensive sectors of the Kenyan economy. As circular economy activities generate economic benefits that spread throughout the economy, business and consumer demand for transportation and electricity would increase, leading to greater consumption of fossil fuels for energy. For the impacts of circular economy activities to be fully carbon neutral, Kenya would likely need to take separate measures to ensure that the transport sector sees higher uptake of renewable energy sources (Karcher et al 2020).

The figures below shows the detailed modelled results of the employment spread per sector for the most promising job creation sectors of Agriculture (Figure 33), Construction (Figure 34) and Recycling (Figure 35).

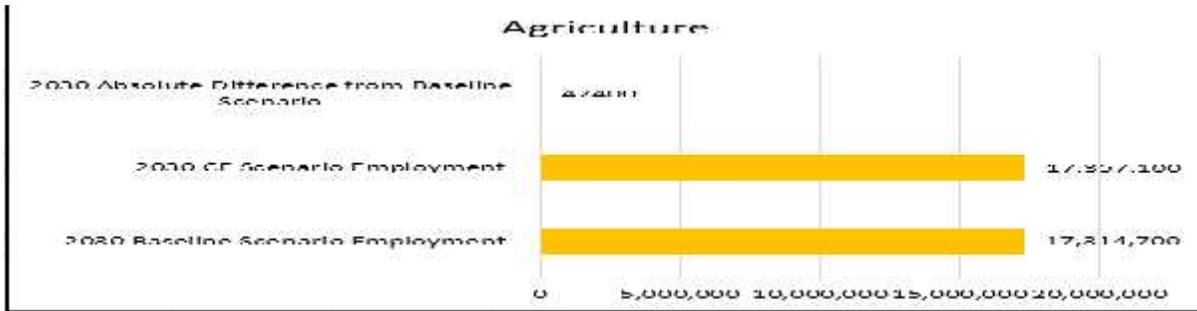


Figure 33: Detailed Employment Results for Agriculture
Source: Karcher et al 2020

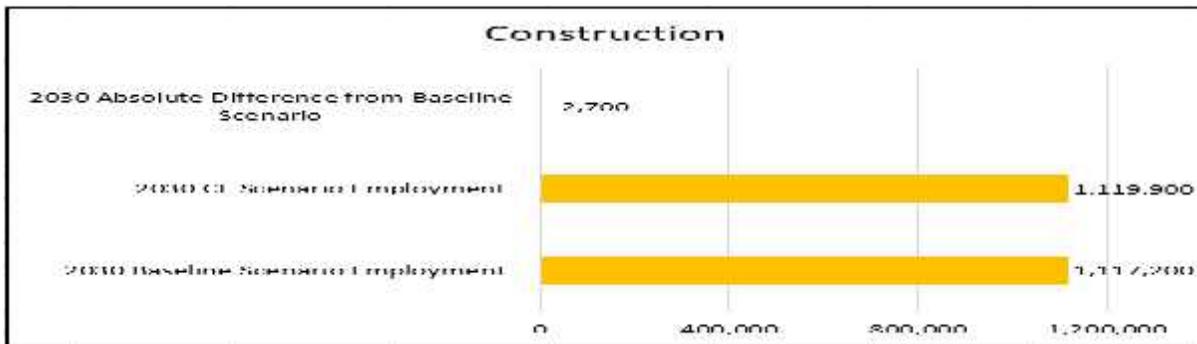


Figure 34: Detailed Employment Results for Construction
Source: Karcher et al 2020

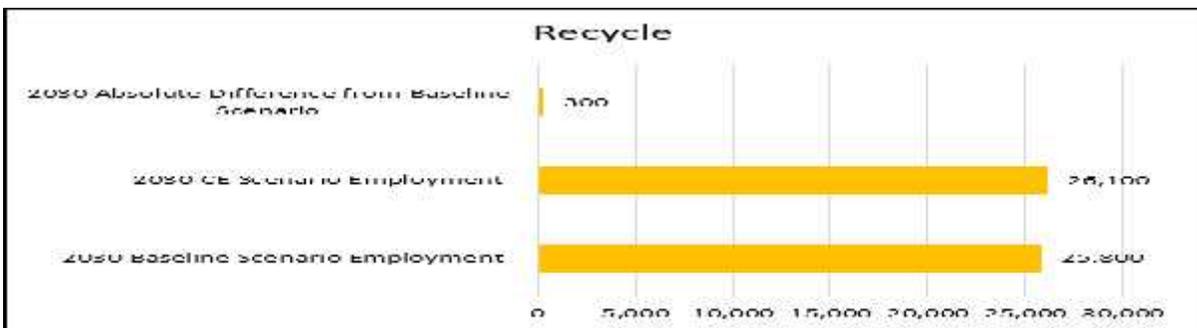


Figure 35: Detailed Employment Results for Recycling
Source: Karcher et al 2020

5.5. Sectorial Opportunities For Green And Circular Economy In Kenya

5.5.1. Green Industrial Parks and Special Economic Zone (SEZ) Investments

According to UNIDO, a national green manufacturing strategy requires an integrated approach: first, the greening of existing industries and enterprises, whereby a government ensures that all industries, regardless of sector, size or location, continuously improve their environmental performance and commits to, taking actions toward, reducing the environmental impacts of processes and products; second, the creation of new green industries, in which a government stimulates the development of industries and enterprises that provide environmental goods and services necessary to responsibly manage products throughout their life cycle (UNIDO, 2011). This symbiotic approach implies that a national green manufacturing strategy should look not only toward improving the manufacturing processes of key subsectors, but also consider new industries that can support and benefit “greening” efforts of manufacturing and other sectors²⁶. A summary of the integrated approach to a green manufacturing Strategy is as shown in Figure 36.

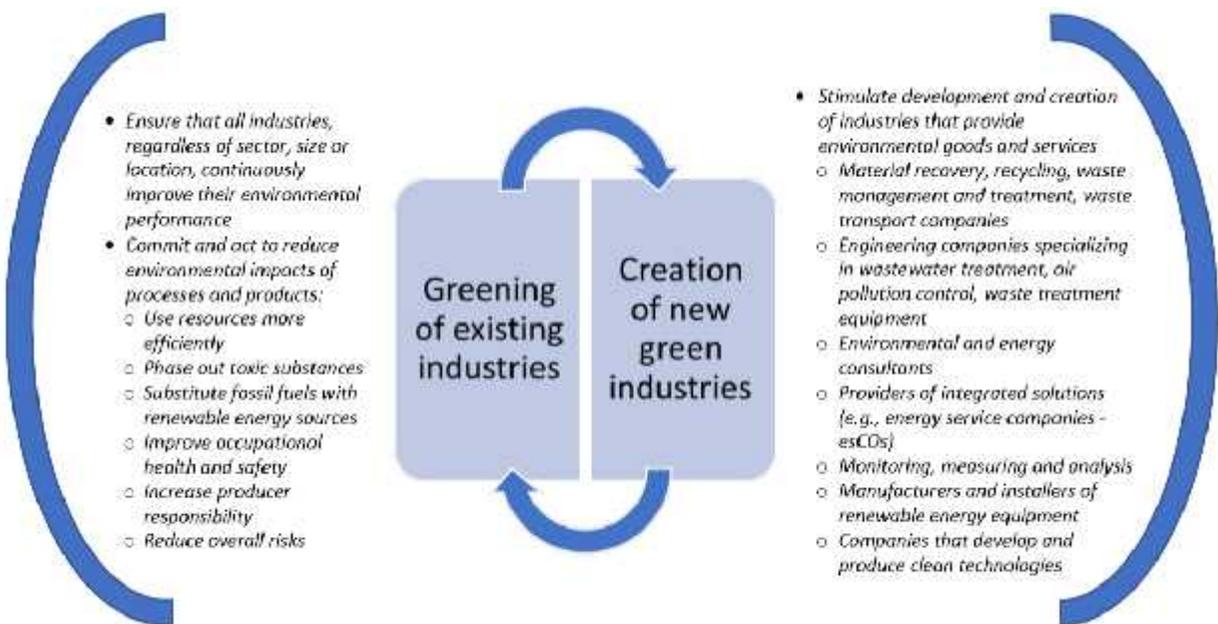


Figure 36: Green Manufacturing Strategy

Source: Modified from UNIDO, 2011

Although green manufacturing is widely discussed globally, there is up to now, no generally accepted definition of this concept²⁷. Early interpretations described green manufacturing as

²⁶ Government of Ethiopia (GoE), 2019. Green Manufacturing Strategy: Growing Industry Sustainably

²⁷ Eco-innovation in industry: Enabling green growth, OECD, 2010, as cited in N Hami et al, The Impact of Sustainable Manufacturing Practices and Innovation Performance on Economic Sustainability, 12th Global Conference on Sustainable Manufacturing

merely being environmentally friendly, and were later refined to focus on three fundamental goals: (1) minimization of emissions, effluents, and accidents; (2) minimization of the use of virgin materials and non-renewable forms of energy; and (3) minimization of the life-cycle cost (from cradle to grave) of products or services²⁸. More recently, green manufacturing is defined within an ecosystem, as the creation of manufacturing products that use processes that are non-polluting, conserve energy and natural resources, and are economically sound and safe for employees, communities and consumers (UNIDO, 2011).

The culture of manufacturing through industrial zones is gathering momentum in the developing world. These industrial zones manifest themselves mostly in form of Export Processing Zones (EPZs), Special Economic Zones (SEZs), and Industrial Parks (IPs). Due to the challenges caused by climate change, countries have been forced to abandon the wasteful and highly polluting traditional industrial zones and instead replace them with resource efficient and low-carbon eco-industrial parks (EIPs). Governments of China and India have developed guidelines and policies that promote green industrial zones, while the Republic of Korea and Thailand have gone ahead to focus on the systematic development of eco-industrial parks (Farole & Akinci, 2011). In the developing world context, EIPs should first embrace resource efficient cleaner production to minimize waste at source with the inevitable residual waste and by-products being exchanged through industrial symbiosis. Industrial zone based companies should work towards increasing their energy efficiency; improving their water use efficiency as well as harvesting; promoting industrial symbiosis through the establishment of input/output, waste and by-product exchange data bases to aid matchmaking as well as the setting up of zone-wide waste exchange clearing houses; industrial process optimization; and promotion of eco-innovation through strengthened Academia-Industry-Government-Civil Society (quadruple helix) collaboration for improved productivity and competitiveness.

The Eco-industrial Park Handbook developed by Ernest 2001 in 2001 for the Asian Development Bank (ADB) defines “[a]n Eco-Industrial Park as a community of manufacturing and service businesses located together on a common property. Members seek enhanced environmental, economic, and social performance through collaboration in managing environmental and resource issues”. By working together, the community of businesses seeks a collective benefit that is greater than the sum of individual benefits each company would realize by only optimizing its individual performance. As a result, EIPs reuse and recycle resources within industrial zones as well as in clustered or chained industries, so that resources circulate in the production system for as long as it is practically possible. Also known as industrial symbiosis, green zone networks are established between companies in the zone to help exchange wastes from one company to the other. Resource use efficiency, carbon footprint determination and industrial symbiosis are important ingredients of a low-carbon green zone. For companies located in designated industrial zones, their close proximity makes it easier and economical for

28 U.S. Department of Commerce. Promoting competitiveness: Partnerships and progress of the office of manufacturing and services. International Trade Administration; 2007, as cited in N Hami et al, The Impact of Sustainable Manufacturing Practices and Innovation Performance on Economic Sustainability, 12th Global Conference on Sustainable Manufacturing

them to embrace waste and by-product exchanges through industrial symbiosis. By doing this, they are able to not only boost their productivity and competitiveness but also create decent green jobs through spin off companies.

Low-carbon, green industrial zones are defined as those that are designed, developed, and operated in a low-carbon, green, sustainable way, and hence they reduce the carbon footprint and effectively addresses climate change mitigation in the process of their economic and industrial activities (Farole & Akinci, 2011). Some of the main attributes of low-carbon, green industrial zones include energy supply in part using renewable energy sources; energy-efficiency measures, including use of energy-efficient production methods for industries; construction of buildings and factories using “green building codes”; waste-reuse and recycling systems inside and outside the zone; promotion of climate-friendly green investments in the zone and clean technology research and deployment; and carbon finance mechanisms that can be utilized in building the zone (Farole & Akinci, 2011). Industrial Zones are good places for pioneering and piloting many GHG emission reduction efforts (WBG, 2014). Global buyers are increasingly focused on the sustainability of their supply chains, often driven by concerns raised by consumers who are increasingly embracing the culture of green consumerism. Increasingly, these buyers are imposing threshold standards and criteria on their suppliers related to higher resource use efficiency, lower GHG emissions, lower local pollution, and waste minimization and recycling (WBG, 2014). To ensure compliance with these basic standards, many companies have launched supply chain performance standards and now pre-assess both direct and indirect suppliers on their adherence to these standards with a view to promoting Green Supply Chain Requirements (WBG, 2014).

A typical low-carbon zone will routinely be involved in the execution of energy audits that allows zone enterprises to comprehensively map their energy consumption patterns across equipment and processes so as to reveal inefficiencies and leakages; undertaking of enterprise level greenhouse gas (GHG) accounting that will enable zone enterprises to continually monitor performance against the emission reduction targets; embrace minimum energy performance standards for equipment’s and enterprises with a view to establishing energy performance benchmarks for each type of equipment in use and also establish clear targets for specific energy consumption at enterprise level; adopt renewable energy through the installation of say solar powered street lighting and installation of rooftop solar panels; assure minimum energy losses through waste heat recovery; promotion of waste reduction, recovery, reuse, and recycling; harvesting of rainwater to help reduce water abstraction from external sources (metering and sub-metering of water consumption, mapping of water consumption across all zone businesses, treating wastewater for onsite reuse, exploring opportunities for rooftop and storm water rainwater harvesting); adoption of a zero-waste zone wide vision; and adoption of the green building code principles for its go- downs, warehouses, residential buildings and offices (WBG, 2014).

5.5.2. Sector Strategies and Investment Opportunities

The following Green Economy Options, Strategies and Investments present investment opportunities for both Government and the Private sector in the priority sectors of Energy, Manufacturing, Waste, Agriculture, Water, Forestry and Biodiversity, Tourism, and Fisheries²⁹ (Tables 3 - 10).

5.5.2.1. Energy Sector Green Economy Strategies and Investment Opportunities

Table 3: Energy Sector Green Economy Strategies and Investment opportunities

	Strategies	Investment Options
E1	Support the use of renewable energy	E1.1. Reinforce the institutional and policy frameworks for renewable energy, through the establishment of County Centres for Renewable Energy across the country;
		E1.2. Provide financial and fiscal incentives to facilitate the development of the renewable energy market, including incentives for the household use of renewable energy (i.e. solar panels) and for the development of new private businesses in this sector
		E1.3. Organize specialized training courses on the building and maintenance of renewable energy infrastructure, installation of renewable energy technologies (e.g., solar water heaters, solar PV).
		E1.4. Promote use of local biomass materials e.g. biogas for electricity production and for biofuel.
		E1.5. Organize awareness raising events on the positive impacts of renewable energy, especially in the context of climate change adaptation and mitigation.
		E1.6. Support the reform of fossil fuel subsidies at the country level, and the reallocation of resources to renewable energy development and pro-poor energy programmes.
		E1.7. Promote the removal of regional market distortions that impede the development, importation and trade in renewable energy technologies (e.g. customs).
		E1.8. Promote development of local green energy industries across the country
E2	Promote energy efficiency	E2.1. Establish national standards and regulations on energy efficiency, in particular in energy intensive sectors such as manufacturing, oil extraction, mining etc.
		E2.2. Support energy efficiency in households through promotional initiatives (i.e. provision of energy efficient cook stoves and light bulbs etc.) and incentives (i.e. custom tax rebates on energy efficient technology) to help encourage the use of innovative technologies.
		E2.3. Promote and incentivize green energy and energy efficiency in industries
E3	Improve energy infrastructure and accessibility to electricity	E3.1. Enhance the implementation of the Energy Master Plan and the National Infrastructure Development Master Plan.
		E3.2. Enhance the implementation of the National Energy Access Strategy and Action Plan.
		E3.3. Conduct national studies and provide guidance on the construction and maintenance of climate resilient energy infrastructure.
E4	Reduce	E4.1. Invest in the development of renewable energy infrastructure in rural areas

29 UNDP, WBG, & GIZ, 2015. Green Economy Strategy and Action Plan for Sustainable Development for the Southern African Development Community (SADC)

Deforestation for energy purposes.	(e.g. mini-grids) in order to increase access to clean energy
	E4.2. Support incentive programmes for the purchase and local production of improved cook stoves.
	E4.3. Promote agroforestry, afforestation and forestation programmes
	E 4.4. Promote alternative clean energy sources and technologies

5.5.2.2. Green Manufacturing Strategies and Investment Opportunities

Table 4: Green Manufacturing/ Mining Economy strategies and investment opportunities

	Strategies	Investment Options
M1	Embrace Resource Efficient Cleaner Production (RECP)	M1.1. Good Housekeeping – preventing leaks, spills, overflows, instituting preventive maintenance schedules, regularly checking equipment, making sure employees work as a team and are following the official work and machine use instructions
		M1.2. Input substitution – substituting one or more less expensive, less dangerous, or more efficient input material for an existing input material that is toxic and dangerous
		M1.3. Better process control – changing work procedures, machine use instructions, and process record keeping to increase throughput, reduce waste, and/or improve product quality
		M1.4. Equipment modification – changing the existing process equipment to increase throughput, reduce waste, and/or improve product quality
		M1.5. Technology change and upgrading – replacing and upgrading the existing technology with one that is more efficient, changing the order of process steps to increase throughput, reduce waste, and/or improve product quality
		M1.6. Product modification – changing the characteristics of the product so as to increase throughput, reduce waste, and/or improve product quality
		M1.7. Energy and Water Use Efficiency – making changes in any aspect of business operations to help reduce energy and water consumption or operational costs
		M1.7. Onsite recovery and reuse – capturing and reusing onsite materials that were previously going to waste
		M1.8. Waste to product – identifying an end market and marketing a material that was formally considered as waste. This might involve changes in the processing of original product or new processing steps to help transform waste
M2	Promote the reduction of the amount of natural resources needed to produce finished goods.	M2.1. Incentivize the introduction of low carbon and resource efficient technology innovations (i.e. water conservation measures, energy efficient machinery)
		M2.2. Promote closed-loop manufacturing
		M2.3. Harmonize manufacturing energy efficiency standards at the national and regional levels
M3	Reduce negative externalities associated with waste and pollution.	M3.1. Harmonize national regulations on effluent limitation and pollution abatement in industries
		M3.2. Promote the location/relocation of industrial parks in less environmentally sensitive areas
		M3.3. Reinforce national regulatory and control mechanisms to help reduce waste and pollution, in particular the dumping of waste at sea and in the general environment
M4	Reduce climate change impacts on manufacturing infrastructure	M4.1. Conduct risk assessment and mapping of risk areas for industry
		M4.2. Establish capacity building programmes on climate change adaptation for the manufacturing sector
		M4.3. Develop climate resilient and climate proofed industries to reduce the impacts of climate change

M5	Support the development of green manufacturing sectors.	M5.1. Promote national endorsement of the East African Community (EAC) Industrial Development Policy Framework
		M5.2. Establish national incentive schemes for the development of green manufacturing sectors, especially renewable energy and energy efficient technologies
		M5.3. Improve access to credit for small and medium enterprises willing to invest in green industrial sectors
M6	Promote the adoption of Sustainable mining practices	M6.1. Support national efforts to enforce mineral extraction sustainability standards
		M6.2. Promote the establishment of Payment for Ecosystem Services (PES) and Polluter Pays Principle schemes in the areas surrounding mining sites.
		M6.3. Enhance the implementation of the Harmonization of Mining Policies, Standards, Legislative and Regulatory Framework in the EAC
M7	Promote Industrial Symbiosis	To increase the valorization of by-products and residual streams, thereby turning the waste of one company/industry into a resource for another. This requires a collaborative (often site-specific) approach and good coordination, sometimes by an experienced third-party (for instance a public agency) to facilitate the implementation. International cooperation can be sought with a focus on best practice sharing, peer-to-peer learning. Pilot projects in given regions (within a country), led by public agencies can be implemented as a means to understand the advantages and constraints, to determine the possibilities of optimizing the local use of material and waste flows and also the possibilities of pooling existing resources to demonstrate the advantages of the sharing economy.

5.5.2.3. Waste Green and Circular Economy Strategies and Investment Opportunities

Table 5: Waste Sector Green and Circular Economy strategies and investment opportunities

	Strategies	Investment Options
W1	Support the building and maintenance of wastewater and solid waste management facilities	W1.1. Establish national investment plans on wastewater and solid waste management facilities
		W1.2. Introduce national and regional waste-tracking and mapping technology
		W1.3. Attract national and foreign investments for the introduction of Waste to Energy (WtE) innovative technology
		W1.4. Engage the communities in wastewater and waste management initiatives
W2	Strengthen control on hazardous and e-waste disposal	W2.1. Define regional standards, targets and regulations for the management of hazardous waste and e-waste.
		W2.3. Establish regional capacity building programmes on hazardous waste and e-waste management
		W2.4. Adopt a national regional protocol on hazardous waste and e-waste management and disposal
W3	Support the improvement and national harmonization of county solid waste management schemes	W3.1. Support the establishment of public-private partnerships (PPPs) for municipal solid waste management, with the involvement of community-based organizations and informal waste collectors
		W3.2. Promote the allocation of investments to the expansion of waste management facilities in urban settings
		W3.3. Promote the enforcement of national regulations on illegal landfills
W4	Promote waste recycling, reuse and reduction.	W4.1. Support the introduction of incentive schemes for waste reduction, reuse and recycling
		W4.2. Promote the adoption of “Pay-as-you-throw” taxes to incentivize waste reduction in households
		W4.3. Establish capacity building programmes on waste recycling and

	waste composting
	W4.4 Promote sustainable production and consumption patterns
	W4.5 Promote the adoption of the “Polluter Pays Principle” to incentivize sustainable management of waste and pollution reduction and prevention

5.5.2.4. Agriculture Sector Green Economy **Strategies’** and **Investment** Opportunities

Table 6: Agriculture Green Economy Strategies and Investment opportunities

	Strategies	Investment Opportunities
A1	Support water supply, conservation and related infrastructure development	<p>A1.1. Water conservation incentives – incentivize water pricing systems that reward conservation, accounting for differences between ecological zones with regards to growing conditions, crops, and other agronomic needs</p> <p>A1.2. Development and promotion of the use of appropriate infrastructure for water use efficiency and water harvesting (e.g. drip, micro, earth dams etc.)</p> <p>A.1.3. Water harvesting</p>
A2	Promote the use of adaptive agricultural technologies and techniques and provide incentives for the development of green agribusiness.	<p>A2.1. Promote and disseminate information about conservation agriculture to help improve soil fertility and soil moisture retention and reduce soil erosion</p> <p>A2.2. Inform and train farmers on cover crops cultivation and diversified crop rotation techniques that help improving soil physical conditions to reduce erosion and increase fertility and Productivity</p> <p>A2.3. Up-scale locally proven Integrated Pest Management (IPM) technologies, especially for important cash crops</p> <p>A2.4. Promote and incentivize use of sustainable nutrient inputs</p> <p>A.2.5. Promote composting and support the use of compost as a substitute to traditional fertilizers in order to enrich soils</p>
A3	Promote land use planning practices	<p>A3.1. Provide training and educational courses on land use planning at the community level, especially for the development of sustainable urban agriculture</p> <p>A3.2. Facilitate the introduction of carbon trading in the agriculture sector, as incentive for improving farming practices</p> <p>A3.3. Promote the use of Geographic Information Systems (GIS) and remote sensing</p> <p>A3.4. Promote land and resource rights</p>

5.5.2.5. Water **Sector** Green **and** Circular Economy Strategies and Investment Opportunities

Table 7: Water Sector Green and Circular Economy Strategies and Investment opportunities

	Strategies	Investment Opportunities
WA 1	Enhance integrated development and management of shared water courses	<p>WA1.1. Formulate a National Integrated Water Resources Management Policy, which should address rural and urban water supply concerns, water efficiency, watershed management, flood management, adaptation to climate change impacts such as sea level rise, floods, droughts, shifts in rainfall patterns etc. (Integrate the GE principles in the National Strategic Action Plan for Integrated Water Resources Management)</p> <p>WA1.2. Develop hydrological models</p> <p>WA1.3. Identify strategies that can improve the coordination of local groundwater storage and banking with local surface storage along with other water supplies including recycled municipal water, surface runoff, flood flows, urban runoff, storm water, imported water, water transfers and possibly desalinated groundwater and seawater.</p> <p>WA1.4. Strengthen the river basin organizations to integrate the GES in</p>

		their programmes.
WA2	Increase water use Efficiency	WA2.1. Build capacity on Efficient Water Management Practices across key sectors of the Economy.
		WA2.2. Promote and invest in technologies to safely recover and reuse wastewater for agricultural irrigation, industrial processes and replenishing of groundwater aquifers etc.
		WA2.3. Approve new incentives and regulations (combined with information and training) to ensure water conservation and water use efficiency by water users.
WA3	Enhance and sustain ecosystems	WA3.1. Enhance and/or introduce environmental flows in river basins.
		WA3.2. Identify and protect lands that will provide habitat for tidal wetlands to adapt to sea level rise
		WA3.3 Introduce and promote and promote payment for ecosystems services
WA4	Preserve, upgrade and increase monitoring, data analysis and management	WA4.1. Invest in modern technologies for water data gathering and monitoring
		WA4.2. Prioritize training and courses on water data analysis, demand management and water balance for the projection of future rain patterns and a better understanding of current and future climate change challenges
WA5	Strengthen capacity in disaster risk Reduction	WA5.1. Strengthen the early warning systems
		WA5.2. Consider climate change projections (sea level rise projections) into national planning processes, including adaptation measures in the various sectors.

5.5.2.6. Forestry and Biodiversity Green Economy Strategies and Investment Opportunities

Table 8: Forestry and Biodiversity green economy strategies and investment opportunities

	Strategies	Investment Opportunities
FO1	Sustainable Forest Management	FO1.1. Support and provide incentives for forest management, including reforestation and afforestation for production purposes
		FO1.2. Conduct national training programmes on sustainable forest harvesting practices.
		FO1.3. Support the establishment of a national inventory through forest measurements, assessments, and mapping
FO2	Expansion of protected areas	FO2.1. Promote the expansion and development of existing protected areas and regulate timber extraction and trade, thereby protecting ecosystems
		FO2.2. Support the establishment of new protected areas, especially in zones affected by recurrent droughts
		FO2.3. Harmonize national laws on control and sanctions for illegal logging
FO3	Investment in agroforestry	FO3.1 Intensify and improve silvo-pastoral practices
		FO3.2. Support the production of tree crops and their integration with other crops, to increase resilience to droughts and soil erosion
FO4	Support the development of Bio Trade	FO4.1. Support capacity building programmes on sustainable extraction and processing of biodiversity products
		FO4.2. Support credit mechanisms and fiscal incentives for the establishment of community-based Bio Trade cooperatives, giving central role to vulnerable groups including women.
		FO4.3. Establish regional institutions to support research and the development of Bio Trade value chains

5.5.2.7 Tourism Green Economy Strategies and investment Opportunities

Table 9: Tourism Green economy strategies and investment opportunities

	Strategies	Investment Opportunities
T1	Promote the reduction of resource intensity in the tourism sector	T1.1. Establish incentive schemes for renewable energy deployment in tourism facilities
		T1.2. Devise and operationalize regional campaigns for the promotion of eco-tourism
		T1.3. Improve access to credit for small tourism businesses willing to invest in sustainable tourism
		T1.4. Establish national and regional sustainability certification programme for hotels and resorts
T2	Support the protection of natural habitats and ecosystems	T2.1. Harmonize laws on natural resource management in the tourism sector
		T2.2. Support investments in the expansion and creation of protected areas
		T2.3. Assist the economic valuation of ecosystem services (e.g. coastal, marine, forest ecosystems)
		T2.4. Encourage the involvement of local communities in development projects that would help preserve the ecosystem
		T2.5. Harmonize regional laws on ecosystem protection (especially coasts and high biodiversity transboundary areas)
T3	Adapt the tourism sector to current and expected climatic changes	T3.1. Create investment and capacity building programmes on disaster risk reduction in the tourism sector
		T3.2. Support the diversification of tourism activities, especially to reduce dependency on climate sensitive resources, such as wildlife
		T3.3. Promote climate change resilient tourism initiatives and establishments
T4	Strengthen the cross border management of natural resources.	T4.1. Enhance the implementation of the Regional Infrastructure Development Master Plan, especially the provisions on the sustainable development of Transfrontier Conservation Areas (TFCA)
		T4.2. Increase tourism employment and income of local communities in Transfrontier Conservation Areas (TFCA)
		T4.3. Establish regional institutional frameworks for the management of TFCA

5.5.2.8 Fisheries Green Economy strategies and investment opportunities

Table 10: Fisheries Green economy strategies and investment opportunities

	Strategies	Investment Opportunities
F1	Promote sustainable utilization of fisheries resources	F1.1. Support the expansion and development of existing marine protected areas
		F1.2. Promote the harmonization of national laws on fisheries to include stricter regulations on the exploitation of fish resources in line with international conventions (i.e. FAO Code of Conduct for Responsible Fisheries and the United Nations Convention on the Law of the Sea - UNCLOS)
		F1.3. Determine the frequency of stock assessments and other necessary research at the national and regional levels, with support from international bodies
		F1.4. Conduct national and regional studies to assess the impact of fishery subsidy reallocation to other sectors (e.g., green aquaculture) as a means to preserve fish stocks, at the same time creating alternative income and employment opportunities for fishing communities.
		F1.5. Establish regional capacity building programmes on sustainable fishing practices.

F2	Promote green Aquaculture	F2.1. Develop reliable management systems for green aquaculture practices, in particular to reduce impacts on lagoon ecosystems
		F2.2. Provide technical advice and assessment for the selection of resilient fish species
		F2.3. Incentivize the greening of small-scale fish farms and promote the creation of cooperatives committed to sustainability
3	Data collection and information sharing	F3.1. Develop and implement stock assessment programmes
		F3.2. Support the constant update of the National Fishing Vessels Register
		F3.3. Develop an effective monitoring, control and surveillance (MCS) system for marine fisheries, building on past experiences
		F3.4. Organize awareness raising events, trainings and media campaigns to share relevant information on existing laws, fish stocks, climate change threats to marine resources and ecosystems, adaptive techniques etc.

CHAPTER SIX: ENABLING CONDITIONS FOR GREEN AND CIRCULAR ECONOMY

6. Sector Specific Enabling Conditions for the Green Transition

This report uses the Agriculture, Water, Energy, and Solid Waste Management sectors to explain the sector specific enabling conditions for a successful green economy transition. These enabling conditions have been modified from the Green Economy Scoping Study for Egypt³⁰.

6.1. Agriculture – Sector Specific Enabling Conditions

Table 11: Sector specific enabling conditions for Agriculture

Enabling condition	Rationale: How it enables	Policy tools that can create the enabling condition
Good governance and institutional set up	There is need for Institutions that function in a transparent, accountable, and in a participatory manner promotes efficiency and optimum use of resources.	<ul style="list-style-type: none"> – Long-term national strategies for sustainable agricultural practices and resource conservation translated into actionable policies with a practical implementation mechanisms. – Adopting a targeted integrated policy approach to reform that adds value to each stage of the agricultural supply chain, from on farm production to sales, distribution, marketing and exporting. – Mainstreaming sustainable agricultural practices, measures, and policies into the macroeconomic and the decision-making processes. – Promote community-based agricultural related activities and the role of private sector and voluntary work.
Regulatory Framework	Ensure through the design of relevant laws and regulations the integrity of the ecosystem and conservation of natural resources and agricultural biodiversity, waste avoidance, reduction, and improved environment and health.	<ul style="list-style-type: none"> – Introduce regulations, land tenure reform, and adequate property rights regime, and farmers’ cooperatives laws that prevent the loss of agricultural land, prohibit the use of harmful chemical pesticides and fertilizers. And finally promote the efficient use of water and other inputs, and ban the burning of agricultural residues. – Introduces legislations that facilitate land ownership through concessional terms to be devoted to organic and sustainable agriculture.

30 United Nations Environment Program (UNEP), Ministry of State for Environmental Affairs, Egyptian Environmental Affairs Agency, and Centre for Environment and Development for the Arab Region and Europe (CEDARE), 2014. Green Economy Scoping Study Report for Egypt.

		<ul style="list-style-type: none"> – Prohibit and enforce through a strict monitoring and penalty system the use of agricultural land for other purposes. – Prohibit the burning of agricultural residues. – Encourage the use of treated wastewater primarily for the irrigation of tree plantations and fodder crops. – Encourage the use of properly treated sludge (free from metals and harmful substances) as a fertilizer.
Market Tools & fiscal support	Provide incentives to encourage: Investment in green agricultural businesses; Efficient use of natural resources and other factor inputs; Green agricultural technologies; and adoption of Organic and sustainably grown agricultural products.	<ul style="list-style-type: none"> – Provide farmers with tax rebates and cuts and targeted subsidies for innovative and resource efficient irrigation and farming techniques. – Facilitate access to modern and innovative equipment and technologies by lowering trade tariffs and custom barriers. – Phasing out subsidies on chemical fertilizers and shifting it to organic fertilizers can attract investment and lower market entry barriers. – Reform the subsidy system to target environmentally negative agricultural practices and encourage positive ones. – Provide disincentives for the wasteful use of water resources through inefficient irrigation systems, energy, and fertilizers. – Provide incentive measure to promote trade in organic and sustainable agricultural products. – Provide incentives and subsidies to encourage the production of compost and fodder from agricultural residues. – Provide incentives for the introduction and expansion of hydroponic cultivation. – Provide incentives for research in innovative agricultural technologies, practices, and breeds.
Public Procurement and expenditure	Public procurement of sustainably grown products contributes to creating markets and increasing demand on organic and sustainably grown products. Public expenditure upgrades utilities and infrastructure of the sector	<ul style="list-style-type: none"> – Prioritization of public expenditure for land reclamation projects, investing in modern irrigation systems, and equipment, and water efficient and post-harvest practices and techniques. – Investment in storage and processing facilities. – Investment in physical infrastructure such as roads, schools, public clubs, and sewerage and electricity networks as a necessary prerequisite for developing and upgrading the agricultural sector. – Invest in much needed social infrastructural services in rural areas in the form of health, sanitation, and education to raise the standard of living of the rural population, their productivity, and sense of belonging. – Investment in urban agriculture and the greening of roofs. – Empower poor local communities by establishing technical agricultural schools in rural areas, providing technical assistance to cooperatives. – Overhauling public agricultural extension services to train farmers and disseminate information, knowledge, and expertise regarding seed, fertilizers, pesticides selection, irrigation techniques, recycling of agricultural residues and other practices.
Capacity Building and Education	– Provide the necessary skills and professional human power to support organic and sustainable agricultural	<ul style="list-style-type: none"> – Provide extension and training services to rural communities. – Empower poor local communities by establishing technical agricultural schools in rural areas, providing

	practices. – Develop the necessary research capabilities for research and development in green technologies and practices in the sector.	technical assistance to cooperatives. – Overhauling public agricultural extension services to train farmers and disseminate information, knowledge, and expertise regarding seed, fertilizers, pesticides selection, irrigation techniques, recycling of agricultural residues and other practices.
Research and Development	Encourage the development of cost effective environmentally sound agricultural technologies and make it accessible to rural communities.	Overall allocation of funding for R&D could be increased to at least 2 per cent of GDP, with a large share allocated to agricultural research in efficient irrigation systems, composting, water saving and draught and insect resistant breeds, organic pesticides and fertilizers.
Access to Finance	Encourage investment in organic and sustainable agriculture infrastructure and activities, innovative technologies, and trade.	Provide micro finance for small farmers, farmers' organizations, and small businesses to encourage environmentally sound agricultural practices such as organic farming.

6.2. Water - Sector Specific Enabling Conditions

Table 12: Sector specific enabling conditions for water

Enabling condition	Rationale: How it enables	Policy tools that can create the enabling condition
Good governance and institutional set up	<ul style="list-style-type: none"> – Institutions that function in a transparent, accountable, and in a participatory manner promotes efficiency and optimum use of resources. – Optimum solutions and options for providing water and energy saving measures should be considered when designing water policies. – Provide water through the network piping system, pumping of underground water, and through wastewater and water treatment plants, and desalination. 	<ul style="list-style-type: none"> – A long-term national strategy and action plan should be developed. The strategy should oversee an action plan for supplying water from non-conventional resources, replenish water ecosystems and conserve water. – Harmonization of existing water policies under the national strategy. This should lead to an overarching integrated water management framework. – Creation of an agency/ authority or departments for water generation from non-conventional resources development – An institutional capacity building program to strengthen the management side of public governance. – The issue of virtual water should also be taken into account as a means of enhancing the potential of water availability in Kenya. The selection of crops to be grown locally should be strategically selected based on the water content of the crop, weighed against food security considerations. – Increase the percentage of recycled wastewater and its use in agriculture and Introduce water-harvesting techniques to capture water, coastal rain and floods.
Regulatory Framework	<ul style="list-style-type: none"> – Ensure through the design of relevant laws and regulations the integrity of the ecosystem and conservation of natural resources especially water biodiversity, and improved environment and health. – The need to develop legislations and maintain actions to ensure conservation and efficient use of water. – Promote, mainstream and 	<ul style="list-style-type: none"> – Enforce related existing legislation and ensure environmental compliance. – Introduce new legislations and standards for wastewater treatments and water desalination. – Introducing water contamination and pollution penalties and related compliance laws and promote the strict use of permits and access certifications as well as efficient metering – Introduce building codes and standards that require the installation of water saving equipment and installations. – Introduce water efficiency minimum standards for the industry and tourism sectors

	enforce non-conventional water supply	
Market tools and fiscal support	<ul style="list-style-type: none"> – Encouraging environmental compliance and the efficient use of natural resources and other factor inputs. – Encourage investment in innovative technologies. – Support the emergence and expansion of green businesses. – Prompt water conservation and influence consumption behaviour. 	<ul style="list-style-type: none"> – Removal of flat rate water tariffs and a new tariff system strategy for consumption to reflect cost recovery of generation, coverage, maintenance and environmental externalities, while cross subsidizing the poor. – Water subsidy reform and introduce tariff system to charge the various economic sectors differently and households according to different income brackets. – Incentives in the form of tax rebates and exemptions for private sector investments. – Facilitate access to modern and innovative equipment and technologies by lowering of trade tariffs and custom barriers. – Provide disincentives for the wasteful use of water resources through inefficient irrigation systems, energy, and fertilizers. – Provide incentives for research in innovative water management research
Public procurement and expenditure	<ul style="list-style-type: none"> – Public procurement of sustainably grown products contributes to creating markets and increasing demand on organic and sustainably grown products. – Public expenditure to upgrade utilities and infrastructure of the sector. – Invest in new infrastructure for treatment and wastewater reuse. – Government setting an example for water efficiency practices and measures 	<ul style="list-style-type: none"> – Prioritization of public expenditure while coordinating between sectors and integrated planning to upgrade water distribution and sewerage networks to reduce wastage in supplying water by proper maintenance, repair, and upgrading of the water network system. Investment in storage and processing facilities. – Invest in non-conventional methods of water generation through desalination and treatment infrastructure.
Capacity Building and Education	<ul style="list-style-type: none"> – Provide the necessary skills and professional human power to support water efficiency management and introduction of non-conventional water generation. – Develop the necessary research capabilities for research and development in green technologies and practices in the sector. 	<ul style="list-style-type: none"> – Provide extension and training services to rural communities. – Provide training and on field learning for experts, local scientists and professionals of the sector. – Introduce trainings to Government officials and decision makers to optimize efficient water management. – Upgrade the skills pool regarding water infrastructure maintenance and operation. – Introduce water management related degrees in universities, vocational schools and graduate studies.
Research and Development	<ul style="list-style-type: none"> – Encourage the development of cost effective environmentally sound water efficiency polices and solutions. – Encourage research and development, and innovation in water saving technologies and equipment. 	<ul style="list-style-type: none"> – Overall allocation of funding for R&D should be increased to at least 2 per cent of GDP, with a large share allocated to water research in efficient irrigation systems, water desalination technologies and integrating the use of solar energy, and water saving among other things
Access to Finance	<ul style="list-style-type: none"> – Promote cost effectiveness of water resource development 	<ul style="list-style-type: none"> – Facilitate access to finance in order to encourage investment in water infrastructure, water conservation, and

	and use. – Facilitate access to finance for investors	water saving measures
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6.3. Energy - Sector Specific Enabling Conditions

Table 13: Sector specific enabling conditions for Energy

Enabling condition	Rationale: How it enables	Policy tools that can create the enabling condition
Good governance and institutional set up	<ul style="list-style-type: none"> – Institutions that function in a transparent, accountable, and in a participatory manner promotes efficiency and optimum use of resources. – A long-term strategy, vision and action plan for sustainable energy – Optimum solutions and options for providing energy efficient and saving measures and solutions 	<ul style="list-style-type: none"> – A long-term national strategy and action should be developed. The strategy should oversee action plans for supplying renewable energy from wind and solar. – An institutional capacity building program to strengthen the management side of public governance. – Harmonizing existing renewable energy policy targets with other energy related laws that account for electricity and conventional energy sources under a uniformed national energy policy framework. – Encourage waste to energy practices. – Replace traditional bulbs with energy saving bulbs in streets, Government buildings and residential homes.
Regulatory Framework	<ul style="list-style-type: none"> – Ensures through the design of relevant laws and regulations the efficient use and allocation of energy. – Promotes CO2 reduction hence improved environment and health. – Address climate change concerns and their potential negative environmental, social, and economic impacts. 	<ul style="list-style-type: none"> – Monitor, enforce related legislation and ensure environmental compliance. – Introduce energy efficient codes and regulations for the different sectors (building and construction sector, industry, tourism, and agriculture). – Introduce strict penalties for non-compliance. – Introduce regulations that encourage the use of renewable energy, including solar, wind, and biofuel.
Market tools and fiscal support	<ul style="list-style-type: none"> – Encourage environmental compliance and the efficient use of natural resources and other factor inputs. – Encourage investment in innovative technologies and green businesses. – Encouraging environmental compliance and the switching to renewable energy sources. – Encourage sustainable patterns of production and consumption of energy 	<ul style="list-style-type: none"> – Remove tariffs on renewable energy technologies to facilitate their importation and use. – Introduce feed-in-tariff system. – Energy subsidy reform should be gradually introduced and designed to account for equity considerations and the poor segments of the population. – Replacing energy subsidies with cash payments to household based on average family size. – Energy pricing should be designed to reflect the purchasing power of different income groups of the population as well as different categories of users (agriculture, industry, tourism, public sector). – Introduce polluter pays schemes internalizing costs and encouraging a shift to cleaner and green energy practices and technologies. – Increase taxes on CO2 emitting industries and other economic activities based on the level of emissions. – Introduce incentive measures, including tax cuts, rebates, and other incentives to encourage efficient and energy saving measures and the use of renewable energy by household and different economic sectors.
Public procurement	<ul style="list-style-type: none"> – Set an example for others sectors to pursue energy 	<ul style="list-style-type: none"> – Prioritization of public expenditure to support and provide infrastructure for renewable energy.

and expenditure	<p>efficient technologies and practices and the use of renewable energy as opposed to fossil fuel.</p> <ul style="list-style-type: none"> – Creates a demand for energy efficient equipment and appliances. – Public expenditure upgrades utilities and infrastructure with emphasis on renewable sources of energy, thus promoting private sector investment 	<ul style="list-style-type: none"> – Integrating energy efficiency measures in designing, constructing and functioning of public buildings. – Gradually replace existing public transport system with an efficient hybrid and electric run fleet. – Encourage private sector investments through private public partnership and long term purchasing contracts for renewable energy generated by private sector projects.
Capacity Building and Education	<ul style="list-style-type: none"> – Provide the necessary skills and professional human power to support water efficiency management and introduction of non-conventional water generation. – Develop the necessary research capabilities for research and development in green technologies and practices in the sector. 	<ul style="list-style-type: none"> – Provide extension and training services to rural communities for efficient uses of energy and use of renewables – Provide formal and on the field training for practitioner, local scientists and professionals. – Provide trainings to Government officials and decision makers to optimize efficient energy use and mainstream renewable energy. – Upgrade skills for energy infrastructure maintenance and operation. – Introduce renewable and efficient energy related degrees and certifications in universities, vocational schools and graduate studies.
Research and Development	<ul style="list-style-type: none"> – Encourage the development of cost effective environmentally sound. Energy efficiency policies and solutions – Encourage research and development, and innovation in renewable energy technologies. 	<ul style="list-style-type: none"> – Overall allocation of funding for R&D should be increased to at least 2 per cent of GDP, with a large share targeting innovative, efficient and renewable energy generating technologies and lower the cost of current related applications
Access to Finance	<ul style="list-style-type: none"> – Encourage commercial renewable energy applications for households and consumer markets. – Promote cost effectiveness of renewable energy production and facilitate access to finance to investors – Facilitate access of private sector, including SMEs 	<ul style="list-style-type: none"> – Micro-finance for small and medium size enterprises, and local communities. – Create a renewable energy fund supported by international donors and Government.

6.4. Solid Waste Management - Sector Specific Enabling Conditions

Table 14: Sector specific enabling conditions for Solid Waste

Enabling condition	Rationale: How it enables	Policy tools that can create the enabling condition
Good governance and	– Institutions that function in a transparent, accountable, and	– Develop a long-term vision, strategy, guidelines, action plan with clear timeframe and responsibilities for

institutional set up	<p>in a participatory manner promotes efficiency and optimum use of resources.</p> <ul style="list-style-type: none"> – Optimum solutions and options for mainstreaming an integrated waste management system when designing national policies. 	<p>implementation.</p> <ul style="list-style-type: none"> – Encourage community-based SWM approaches and practices through the engagement of local NGOs and small and medium size enterprises. – Promote sustainable integrated solid waste management (ISWM) practices with emphasis on 4Rs; waste avoidance in the first place, reduce, reuse, recycling, and recovery. – Promote producer responsibility to reduce the generation of waste in the manufacturing process. – Encourage on-site sorting and separation of waste streams by different actors. – Build institutional capacities on the municipality level targeting waste efficient budgeting, monitoring and planning. – Encourage waste to energy practices.
Regulatory Framework	<ul style="list-style-type: none"> – Provide the necessary legal framework that promotes the integrity of the ecosystem and the efficient use of natural resources, biodiversity, and improved environment, health, and human welfare. – Encourage private sector engagement and investment in SWM activities. – Encourage sustainable production and consumption patterns. – Identify responsibilities and role of different Government entities in SWM. 	<ul style="list-style-type: none"> – Enforce related existing legislation and ensure environmental compliance. – Introduce specific waste related compliance laws with strong penalties against irresponsible behaviour and illegal dumping, strict land use permits and access certifications. – Introduce penalties for the burning of solid waste, dumping in open dumpsites and waterways. – Introduce laws that facilitate the engagement of private sector in SWM activities.
Market tools and fiscal support	<ul style="list-style-type: none"> – Encourage environmental compliance and the efficient use of natural resources and other factor inputs. – Support the emergence and expansion of green businesses. – Support the mainstreaming of an integrated solid waste management system in public policy 	<ul style="list-style-type: none"> – Develop a recycling market through market-based instruments such as recycling credits, tax reductions, market driven certification, and performance bonds. – Facilitate and provide incentives for the export of locally produced waste technologies and products. – Reflect full cost recovery through user pay and polluter-pays principles accompanied. However any cost recovery policies should not impose extra burdens on poor and low-income families and communities. – Incentive measures including tax cuts, rebates, and other incentive. – Introduce incentive measures including tax cuts, rebates, for private sector involvement. – Provide incentives for R&D and human resource development
Public procurement and expenditure	<ul style="list-style-type: none"> – Public procurement of sustainable products contributes to creating markets and increasing demand of green and recycled products. – Public expenditure upgrades utilities and infrastructure needed to support sector development. – Provide necessary space for 	<ul style="list-style-type: none"> – Prioritization of public expenditure to support and provide infrastructure, and equipment for an ISWM system. – Encourage private sector investments through private public partnership and long term purchasing contracts for renewable energy generated by private sector projects. – Give priority to the purchase of recycled products and material for use by Government entities and as an input in production processes and building and construction. – Allocate sufficient funding for human resource development and R&D.

	SWM facilities, transfer stations, and sanitary landfills.	
Capacity Building and Education	<ul style="list-style-type: none"> – Provide the necessary skills and professional human power to support water efficiency management and introduction of non-conventional water generation. – Develop the necessary research capabilities for research and development in green technologies and practices in the sector. 	<ul style="list-style-type: none"> – Provide extension and training services to rural communities. – Provide training and on field learning for experts, local scientists and professionals of the sector. – Introduce trainings to Government officials and decision makers to optimize efficient water management. – Introduce waste management related degrees in universities, vocational schools and graduate studies.
Research and Development	<ul style="list-style-type: none"> – Provide the necessary know-how and technologies needed for the development of the sector, including supporting waste to energy and waste to compost investment. 	<ul style="list-style-type: none"> – Allocate sufficient funding for R &D and innovation in SWM equipment, products, and processes
Access to Finance	<ul style="list-style-type: none"> – Encourage commercialization of solid waste management solutions and applications. 	<ul style="list-style-type: none"> – Develop financial frameworks to facilitate access to finance, through credits, long-term low interest loans, micro funding for entrepreneurs and SMEs in addition to promoting public private partnerships.

6.5. Green Manufacturing – Sector Specific Enabling Conditions

Table 15: Sector specific enabling conditions for green manufacturing

Enabling condition	Rationale: How it enables	Policy tools that can create the enabling condition
Good governance and institutional set up	<ul style="list-style-type: none"> – Institutions that function in a transparent, accountable, and in a participatory manner promotes efficiency and optimum use of resources. – A long-term strategy, vision and action plan for sustainable green manufacturing – Optimum solutions and options for providing green manufacturing, associated savings and solutions 	<ul style="list-style-type: none"> – A long-term national green strategy and action plan should be developed. Such a strategy should emphasize action plans that assure an accelerated uptake of green manufacturing practices by Kenyan businesses - An institutional Green Manufacturing capacity-building program to support businesses in Kenya support should be established - There is need to enhance cooperation, set consensus goals and priorities, and establish a coordinated approach to green manufacturing among relevant government institutions - There is need to institutionalize communication channels between subsector institutes and Ministry of Industry (MoI) for purposes of enabling the environmental directorates/departments to work with the MoI in solving issues together through knowledge sharing, financial planning and general capacity building, including contracting of external assistance - There is need for the creation of a communication platform between subsector environmental directors/department heads - There is need to engage in advisory support networks so as to build local capacity of the subsector institutions - There is need to develop an industrial park operational framework that incorporates green manufacturing practices for Kenya and the accompanying Action Plans based on the industrial parks (IPs) requirements stipulated in the International Framework on Eco-Industrial Parks prepared

		by UNIDO, WB and GIZ
Regulatory Framework	<ul style="list-style-type: none"> – Ensures through the design of relevant laws and regulations an accelerated adoption of green manufacturing practices 	<ul style="list-style-type: none"> - Strengthen and create enabling mechanisms for effective law enforcement and compliance with social standards - Voluntary subscription to voluntary codes of practice should be encouraged to lessen the enforcement burden
Market tools and fiscal support	<ul style="list-style-type: none"> – Encourage environmental compliance and the efficient use of natural resources and other factor inputs. – Encourage investment in innovative technologies and green businesses. – Encouraging environmental compliance and the switching to renewable energy sources. – Encourage sustainable patterns of production and consumption 	<ul style="list-style-type: none"> – Remove tariffs on green manufacturing technologies to help facilitate their importation and use.
Public procurement and expenditure	<ul style="list-style-type: none"> – Set an example for others sectors to pursue green manufacturing technologies and practices. – Creates a demand for green manufacturing enabling equipment and appliances. – Public expenditure upgrades utilities and infrastructure with emphasis on green manufacturing, thus promoting private sector investment 	<ul style="list-style-type: none"> – Prioritization of public expenditure to support and provide infrastructure for green manufacturing. – Integrating resource efficiency measures in designing, constructing and functioning of public buildings. – Gradually replace existing public transport system with an efficient hybrid and electric run fleet. – Encourage private sector investments through private public partnership and long term purchasing contracts for green manufacturing technologies
Capacity Building and Education	<ul style="list-style-type: none"> – Provide the necessary skills and professional human power to support Green Manufacturing – Develop the necessary research capabilities for research and development in green technologies and practices in the sector. 	<ul style="list-style-type: none"> - Incentivize the introduction of low carbon and resource efficient technology innovations (i.e. water conservation measures, energy efficient machinery) - Promote closed-loop manufacturing - Establish capacity building programmes on climate change adaptation for the manufacturing sector - Develop training modules to assist government entities to increase their knowledge and skills to best implement environmental duties and initiatives - Establish a common information clearinghouse accessible to all manufacturing sector stakeholders - Update the Kenyan Environmental Standard for Industrial Pollution Prevention based on standards of the country's strategic export markets - Provide infrastructure and build capacity to implement a comprehensive system for monitoring the environmental and social standards of the manufacturing sector - Develop infrastructure to monitor and record harmful non-GHG emissions - Implement comprehensive reduce, reuse, recycle programs in manufacturing factories <p>The Kenyan Government and other stakeholders to develop</p>

		<p>and operationalize eco-labeling schemes for manufactured green products</p> <ul style="list-style-type: none"> - Develop a clear link between business license renewal and environmental compliance based on environmental clearance letters - Develop climate resilient and climate proofed industries to reduce the impacts of climate change
Research and Development	<ul style="list-style-type: none"> - Provide the necessary know-how and technologies needed for green manufacturing, including supporting resource efficient cleaner production practices. 	<ul style="list-style-type: none"> - Overall allocation of funding for R&D should be increased to at least 2 per cent of GDP, with a large share targeting the strengthening of green manufacturing capabilities
Access to Finance	<ul style="list-style-type: none"> - Encourage the adoption of green manufacturing practices 	<ul style="list-style-type: none"> - Development and implementation of a green manufacturing policy framework that incorporates mechanisms and instruments for creating incentives and support services for green manufacturers and establish MoI's involvement in designing appropriate green financing mechanisms targeting the manufacturing sector - Improve access to credit for small and medium enterprises willing to invest in green manufacturing - The Kenyan Government to operationalize green funds

6.6. Transport – Sector Specific Enabling Conditions

Table 16: Sector specific enabling conditions for green transport

Enabling condition	Rationale: How it enables	Policy tools that can create the enabling condition
Good governance and institutional set up	<ul style="list-style-type: none"> - Institutions that function in a transparent, accountable, and in a participatory manner promotes efficiency and optimum use of resources. - Optimum solutions and options for mainstreaming green transport practices in the country. 	<ul style="list-style-type: none"> - Develop a long-term green transport vision, strategy, guidelines, action plans with clear timeframes and responsibilities for implementation - Governments should work to reap benefits of sustainable transport by pushing demand away from private motorized transport, while pulling demand towards public and other forms of sustainable transport - Political leadership: Foster political champions for sustainable urban transport policies - Institutions: Establish integrated urban transport agencies, which would be tasked with overseeing the development of key policies to help manage transport demand, control expenditures, develop an integrated plan for public and non-motorized transport, and the enforcement of traffic regulations (this should be done in the pretext of a sustainable urban development plan/strategy which should cut across various government departments)
Regulatory Framework	<ul style="list-style-type: none"> - Encourage private sector engagement and investment in green transport - Encourage sustainable production and consumption patterns. 	<ul style="list-style-type: none"> - Implement regulatory measures such as vehicle efficiency standards and fuel standards - Reserving road space and giving priority to sustainable modes of transport such as public transport and non-motorized transport. - Formalization of transport services and integration of modes of transport to help improve connectivity and convenience (including non-motorized transport) - Integration of transport modes: The urban transport

		<p>authority should be responsible for integrating the various modes of public transport, so that they all form part of a single system/network</p> <ul style="list-style-type: none"> - Quality infrastructure: Infrastructure for non-motorized and public transport, such as bus/train/metro stations should enable easy access to all users, including those with mobility impairments - Technology: Combine local technologies with those from other regions. This could include south-south transfer of key technologies, such as the bus rapid transport (BRT) - Provision of information to the public: The benefits of using public transport, including financial savings to households, improved health and lower burden to the environment need to be communicated to the public, e.g. through targeted green campaigns - Shifting transportation from road to high speed rail - Affordable fares: Public transport fares should be set at rates, which allow all members of society their use. Conversely, the price of using private cars should be higher than that of using public transport, e.g. through congestion charging and parking fees
Market tools and fiscal support	<ul style="list-style-type: none"> - Encourage environmental compliance and the efficient use of natural resources and other factor inputs. - Support the emergence and expansion of green modes of transport 	<ul style="list-style-type: none"> - Promote private investments in more environmentally efficient vehicle and fuel technologies through e.g. tax cuts/rebates, and subsidies/grants for research and development - Provide national grants and loans with favorable conditions (e.g. lower interest) for sustainable urban transport - Promoting distance-based car insurance schemes: Traditional forms of car insurance ask for a flat fee for a certain amount of insured period, e.g. one year. The fee normally does not reflect the amount of driving. Linking the insurance premium to the volume of vehicle use (kilometres driven) can serve as a financial incentive for drivers to use their cars less
Public procurement and expenditure	<ul style="list-style-type: none"> - Public procurement of sustainable products contributes to creating markets and increasing demand for green transport should be encouraged - Public expenditure upgrades utilities and infrastructure needed to support the green transport sector 	<ul style="list-style-type: none"> - Award transport contracts to companies that demonstrate green transport capabilities - Prioritization of public expenditure to support and provide infrastructure, and equipment for a green transport mix - Encourage private sector investments through private public partnership and long term purchasing contracts for green transport promotion - Allocate sufficient funding for green transport R&D
Capacity Building and Education	<ul style="list-style-type: none"> - Provide the necessary skills and professional human power to support the switch to green modes of transport - Develop the necessary research capabilities for research and development in green transport capabilities 	<ul style="list-style-type: none"> - Provide professional training on green transport modes - Promote green innovations in green transport - Provide training and on field learning for experts, local scientists and professionals of the sector in green transport. - Introduce trainings to Government officials and decision makers to help optimize the accelerated adopt of green transport practices - Introduce green transport related degrees in universities, vocational schools and graduate studies.
Research and Development	<ul style="list-style-type: none"> - Provide the necessary know-how and technologies needed for the development of the 	<ul style="list-style-type: none"> - Allocate sufficient funding for R &D and innovation in green transport design, construction, and use

	green transport sector	
Access to Finance	<ul style="list-style-type: none"> – Provide affordable funding for green transport promotion 	<ul style="list-style-type: none"> – Develop financial frameworks to facilitate access to finance, through credits, long-term low interest loans, micro funding for green transport entrepreneurs and SMEs in addition to promoting public private partnerships. - Financing: Setting up an urban transport fund. The fund could draw resources from various sources, including those on car users, collected as congestion charges or parking charges to oversee investments in sustainable transport, especially public transport and non-motorized transport

6.7. Construction and Real Estate – Sector Specific Enabling Conditions

Table 17: Sector specific enabling conditions for green construction

Enabling condition	Rationale: How it enables	Policy tools that can create the enabling condition
Good governance and institutional set up	<ul style="list-style-type: none"> – Institutions that function in a transparent, accountable manner, and in a participatory manner promotes efficiency and optimum use of resources. – A long-term strategy, vision and action plan for sustainable green building promotion – Optimum solutions and options for providing resource use efficient and saving measures deriving from the adoption of green buildings 	<ul style="list-style-type: none"> – A long-term national green building strategy and action plan should be developed. The strategy should oversee action plans for embracing green building practices – An institutional green building capacity building program to help strengthen and accelerate the adoption of the green buildings culture - Development of green building codes - Collect and disseminate best practices on green buildings and sustainable urban planning for reduced resource consumption in cities - Harmonize national standards and guidelines on sustainable green buildings
Regulatory Framework	<ul style="list-style-type: none"> – Ensures through the design of relevant laws and regulations an accelerated adoption of green building practices – Address climate change concerns and their potential negative environmental, social, and economic impacts. 	<ul style="list-style-type: none"> - Reduce water consumption and provide alternatives to piped water supply (through rain-water harvesting and reuse and recycling of waste water) - Promote the adoption of green building rating tools - Devise incentive schemes for encouraging the use of sustainable building materials - Modernize water pipe systems to help reduce water wastage – Monitor and enforce related green building legislation so as to assure environmental compliance – Introduce water, energy and materials use efficiency codes and regulations for different sectors (building and construction sector, industry, tourism, and agriculture) - Voluntary labelling and certification of green buildings can serve as the basis for promoting green buildings - Introduce green building ratings, certification and appliance labels to enable consumers to make informed decisions while providing specifics for developers and architects – Introduce strict penalties for non-compliance to green building codes – Introduce regulations that encourage the use of renewable energy, including solar, wind, and biofuel as part of the green building practice.
Market tools and fiscal support	<ul style="list-style-type: none"> – Encourage environmental compliance and the efficient use of natural resources and 	<ul style="list-style-type: none"> - There is need for fiscal incentives, such as grants, subsidies and tax breaks, to be awarded to residential and commercial buildings applying

	<p>other factor inputs.</p> <ul style="list-style-type: none"> – Encourage investment in innovative technologies and green building promotion. – Encouraging environmental compliance and the switching to renewable energy sources. – Encourage sustainable patterns of production and consumption 	<p>energy efficiency measures or carrying out audits to cover the additional costs, especially when the market is premature</p> <ul style="list-style-type: none"> - There is need for the creation of preferential green building loans, green mortgages, revolving funds, and third party financing through the use of energy service companies (ESCOs) – Remove tariffs on renewable energy technologies to facilitate their importation and use – Introduce polluter pays schemes internalizing costs and encouraging a shift to cleaner and green energy practices and technologies. – Increase taxes on CO2 emitting industries and other economic activities based on the level of emissions. – Introduce incentive measures, including tax cuts, rebates, and other incentives to encourage efficient and energy saving measures and the use of renewable energy by household and different economic sectors.
Public procurement and expenditure	<ul style="list-style-type: none"> – Set an example for others sectors to pursue energy efficient technologies and practices and the use of renewable energy as opposed to fossil fuel. – Creates a demand for energy efficient equipment and appliances. – Public expenditure utilities and infrastructure upgrades should put emphasis on renewable adoption 	<ul style="list-style-type: none"> – Prioritization of public expenditure to support and provide enabling infrastructure for renewable energy. – Integrating energy efficiency measures in designing, constructing and functioning of public buildings. – Gradually replacing existing public transport system with an efficient hybrid and electric run fleet. – Encouraging private sector investments through private public partnership and long term purchasing contracts for renewable energy generated by private sector players.
Capacity Building and Education	<ul style="list-style-type: none"> – Provide the necessary skills and professional human power to support an accelerated adoption of green buildings – Develop the necessary research capabilities for green building promotion 	<ul style="list-style-type: none"> – Provide formal and on the field training for green building practitioners, local scientists and other professionals. – Provide trainings to Government officials and decision makers on the importance of embracing green buildings – Introduce green building related degrees and certifications in universities, vocational schools and at graduate studies level.
Research and Development	<ul style="list-style-type: none"> – Encourage the adoption of green building practices across the different sectors of the economy – Encourage research and development, as well as eco-innovation in the green buildings sector. 	<ul style="list-style-type: none"> – Overall allocation of funding for R&D should be increased to at least 2 per cent of GDP, with a large share targeting the accelerated adoption of green building practices across the country.
Access to Finance	<ul style="list-style-type: none"> – Encourage commercial renewable energy applications for households and consumer markets. – Promote cost effectiveness of renewable energy production and facilitate access to finance to investors 	<ul style="list-style-type: none"> – Micro-finance for small and medium size green building renovations and retrofits – Create a green building fund supported by international donors and Government itself.

CHAPTERSEVEN: BARRIERS TO GREEN AND CIRCULAR ECONOMY

7. *Introduction*

In order to enable a successful green transition in Kenya, action needs to be taken on strengthening education, awareness and communication capabilities of the green message; working to create an enabling green policy and regulatory framework; promoting technological innovation; strengthening stakeholder collaboration and creation of markets for green products³¹. Company culture and personal beliefs do influence the pace at which the green transition takes place. It becomes a barrier for organizations that are inhabited by uninformed and un-convinced people³². The barriers in this regard include company reluctance to collaborate in the value chain due to competitive, cultural or trust issues; the reluctance of consumers to buy 'used' products and materials or pay a reasonable price for them; and the comfort of operating in a known and trusted linear system versus the discomfort of trying a new circular world (WBCSD & CE, 2018).

³¹ARUP, 2016. The Circular Economy in the Built Environment

³²WBCSD & CE, 2018. Scaling the Circular Built Environment, Pathways for Business and Government

Legislation and regulations help create a level playing field that assures fair trade protection, protection of health and safety concerns, as well as the protection of humans and the environment. Ambitious laws can be designed to drive eco-innovation. Regulatory barriers that hinder the accelerated uptake of the circular economy includes limited commitment to circular green procurement and having laws, regulations and technical standards that do not support the innovations that are needed in the circular economy set up. Markets are key drivers for the circular economy. The prevailing market barriers in Kenya low-virgin material prices; high upfront investment costs; limited subsidies or market incentives for secondary material and products; and lack of market volumes or economies of scale for new and innovative circular products (WBCSD & CE, 2018). Policy is also needed to help remove barriers, such as altering the definition of waste to facilitate re-use and minimize landfilling.

This would also help to support new markets for secondary materials, for example, and unlock new revenue streams. Policy can support organizations seeking to train or up-skill their workforce. New policy measures can also help to drive innovation by providing incentives (to develop demonstration projects) and by creating a more secure environment for investors (Arup, 2016). Policy interventions can accelerate change and promote procurement that favours whole lifecycle approaches. Industry advocacy is also needed to facilitate and steer regulation on procurement (Arup, 2016). As digital technology spreads, governments are coming under increasing pressure to regulate public data sharing and security practices. Embedding circular economy thinking into standards will ensure that governments are better equipped for a more integrated and resilient digital future. The transition to a green and circular economy requires green technologies.

The associated technical barriers include the region's limited experience with circular designs; lack of large-scale demonstrations projects and experiences with green technologies; inability to share information about the availability, quality, and location of circular materials; and lack of data on environment footprints, technical performance, tracking and reuse planning (WBCSD & CE, 2018). The internet of things will support the databases behind materials passports, or help stakeholders find out how to reuse materials or share 3D models. There is lack of education programs in circular thinking for primary and secondary schools, vocational and higher technical education; limited communication about the economic and environmental benefits of going green; lack of knowledge-sharing, limited sharing of best practices in the green economy space; no time for market actors to follow informative courses about the benefits and the circular economy approach; and lack of consumer and investor awareness and interest in circular economy. To unlock the circular economy, stakeholders throughout the value chain need education and more awareness to shift their mindsets (Arup, 2016). Cross-industry collaboration and sector networks will provide platforms to exchange information, experiences and best practice.

Selected barriers to the green and circular transition are as explained in detail below:

7.1. Technical *barriers to the circular economy synergy*

Companies must first deal with complexity in terms of waste repurposing, materials degradation and the impurity of sub-products used in the recycling processes. The physical characteristics of waste flows can make it impossible to establish the anticipated synergies; the physical state and components of waste are sometimes incompatible with other manufacturing processes. Generally, industrial recycling degrades materials, which lose purity as early as the first stages of manufacturing by being mixed and processed along with a diversity of additives that ensure they attain the desired properties (Gallaud & Laperche, 2016). Through the recycling process, materials may be degraded, so it does not suffice to recover waste. Instead, it is necessary to also preserve its properties throughout the recycling process. Sorting and separating waste also represents technical and organizational challenges to the recycling process. Sorting plastic, scrap waste metal and all kinds of waste is very costly as it results in the combined additional cost related to collection, transportation and sorting. Ultimately, some materials were not designed to be recycled and are practically impossible to repurpose, since separating their components poses several difficulties and represents important costs for companies.

7.2. Economic *Barriers*

Creating synergy between companies essentially depends on their economic interests. Implementation decisions are based on an estimation of the ratio between price and cost, adjusted by a (technical and economic) risk estimate. The amount of waste that companies can potentially reuse is also considered an economic barrier when this amount is insufficient, since it generates additional costs. Transforming waste into raw materials requires large investments because it often involves purchasing new equipment that must be operated and maintained. For this reason, the need for qualified human resources increases and training becomes necessary to successfully implement a circular economy project. Companies' top management hesitates to invest in green and circular economy as it is only profitable in the long-term and, therefore, does not necessarily respond to short-term strategic profit priorities. To this we must add the unreliability of the undertakings, as well as lack of experience in terms of circular economy's financial and legal framework.

The economic returns of green and circular economy may also face quantitative limits. Given that waste processing is a complete production chain, the inverse relationship between the amount of waste processed and cost is the same as for any other production chain, in which cost-control essentially depends on attaining economies of scale. Raw materials to be processed cannot be found at a single "provider". This scattered offering can lead to reliable amounts from each waste producer, which must be collected until a certain profitability threshold is reached before beginning the processing process. Therefore, if there are several stakeholders in the region that all possess different quantities of the same material to be processed, it will be necessary to raise awareness of the imperative of collaborating so as to attain more optimal management of the production chain through massive material flows.

7.3. Informational barriers

The information necessary for the implementation of circular economy (especially elements describing industrial metabolism as an estimate of the energy, materials stock and flow) is not always available and needs to be pooled, translated (through the establishment of a common set of terms), coordinated and disseminated. It is also sometimes made difficult to access and the culture of industrial secrecy can slow down the circulation of information between firms. On the one hand, disseminating process information (materials used, components, quantity, etc.) is often difficult for companies. On the other hand, industrial stakeholders do not manage to negotiate, lack reciprocal trust and prefer to keep their inflow/outflow balance sheets confidential, even while these are necessary for the establishment of eco-industrial relationships. This makes it more difficult to develop the desired synergies.

7.4. Organizational barriers

The unavailability of productive devices and of technology appropriate for waste treatment within companies, the absence of a culture of partnerships, change and data confidentiality directly affects synergy implementation interests. Moreover, it is important to note that only recently have companies become aware of the environmental effects of productive activities, especially in small and medium-sized enterprises. Ultimately, transportation and logistics service providers, waste treatment services, water supply management, energy and gas flow transformation services are not always available, which leads to further organizational difficulties, especially as regards coordination between actors.

7.5. Regulatory barriers

Regulation is an essential element in the development of eco-industrial synergies. It has an impact on the attractiveness of flow exchanges between industrial stakeholders and on their motivation. Regulation and fiscal instruments can help stimulate the emergence of recycling operations, but a lack of public incentives can also negatively influence decisions that seek to develop synergies between companies.

7.6. Infrastructural barriers

The necessary infrastructure is not always available (for example, gas or water pipelines connecting two companies), which makes it difficult to establish synergies. The distance between two companies, whose synergy is considered possible technically, can increase difficulties related to the construction of the necessary infrastructure.

7.7. The human dimension

Human factors play an essential role in the success or failure of this environmental strategy, even if the establishment of synergies proves to be economically possible, top management's resistance to cooperation with other companies, lack of commitment to that kind of cooperation and resistance to data sharing are some elements of the culture of competition and industrial secrecy. Not only can these elements slow down efforts to implement the circular economy, but they can also stop the creation of synergies that could be profitable in the mid-term.

\In summary, these barriers can be listed as follows: inability to accurately measure the financial benefits of CE; lack of large-scale demonstration projects; high upfront investment costs and lack of financial capability and support for circular business models; low virgin material prices; lack of network support and partners and limited willingness to collaborate in the value chain; lack of tools and methods to help measure (long-term) benefits of CE projects; lack of social awareness and uncertainty of consumer responsiveness and demand; lack of market mechanisms for resource recovery; lack of clear incentives or policies in support of a CE transition; complex and overlapping regulations; limited governmental support; lack of CE know-how of some political decision-makers; lack of standardization; lack of information and knowledge, e.g. on unforeseen impacts; lack of technologies and technical skills related to CE; incompatibility with existing (linear) operations and development targets; conflicts with existing business culture and lack of internal cooperation; silo thinking; heavy organizational hierarchy and lack of top management support; missing exchange of information; unclear responsibility distribution; weak infrastructure and supply chain management; lack of consumer awareness and interest; limited circular procurement; hesitant company culture i.e. risk aversion; uncertainty about its financial profitability; lack of global consensus; perception of sustainability; integration into production processes; and lack of circular design in products(EIT, 2020).

SECTION TWO: MODELING KENYAS ACCELERATION

CHAPTER EIGHT: MODELS FOR ACCELERATING TRANSITION OF PRIVATE SECTOR TO GREEN AND CIRCULAR ECONOMY IN KENYA

As more business and firms begin to recognize the potential benefits of circularity, demand for a coherent and simple framework for action – to be relied upon when commencing their transition³³ – will obviously rise. CE is a vast concept that covers a conspicuous number of innovative processes and business models touching on all stages of the value chain, with no one-size-fits-all solution. Dematerialization, input materials optimization and circular feedstock, environmental performance maximization, renewable energy adoption, solid waste and water management and re-use, and servitization are just some of the many options a firm can use to exploit the economic opportunities of the CE (Tonelli & Cristoni, 2019).

A fundamental principle of the transition toward a more circular economy is one that focuses on maximizing the value of materials and resources through more “closed-loop” processes, and as a way to minimize the need for new raw materials and natural resources (Delphi, 2017). To accelerate transition to green and circular economy, business in Kenya should the the following framework to identify the best circular strategies for their businesses. (Figure 37)

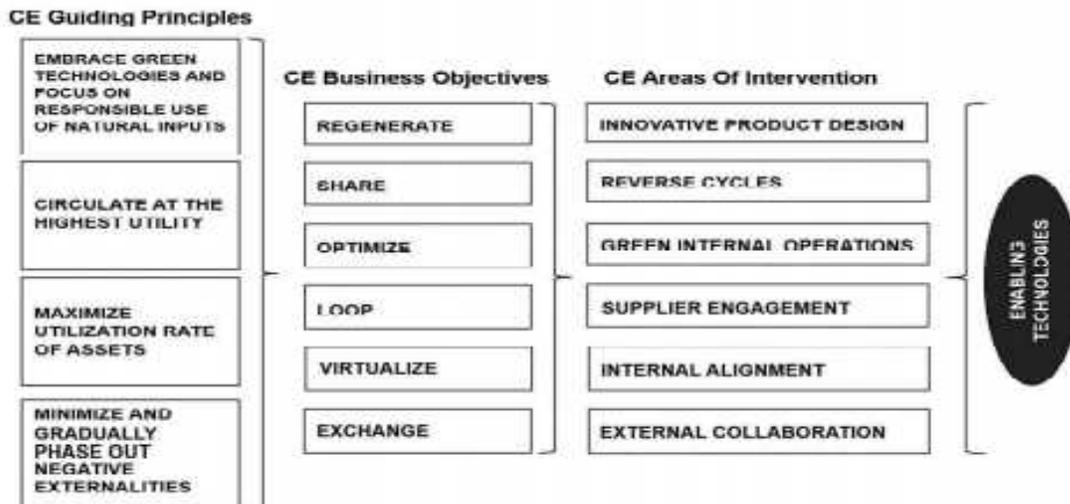


Figure 37: Framework for Circularity in Business Strategy

Source: Tonelli & Cristoni, 2019.

The strategic map outlines high-level guiding CE principles, the philosophical pillars of circular thinking; CE objectives (**ReSOLVE**) that can lead to new business opportunities; and finally, areas of intervention for operationalizing the circular opportunities identified (Cristoni and Tonelli 2019).

33 Ellen MacArthur Foundation. 2012. “Towards the Circular Economy Vol. 1: An Economic and Business Rationale for an Accelerated Transition.”

7.8. Models To Accelerate Business in Kenya To Green and Circular Economy

- **Integrate Product LifeCycle Assessment to tap into UpstreamCircular Interventions**
Industrial *production* to scale up Upstream efforts are largely focused on the prevention of waste by maximizing the value of materials and resources; minimizing the need for new raw materials and toxic inputs;³⁴Key upstream interventions include undertaking product lifecycle assessment in order to identify and maximizing the value of materials and resources; decoupling resources from negative impacts; embracing the bio-economy strategy; adopting waste prevention; focusing on repair, reuse, and remanufacturing; embracing innovation funds for R&D promotion;
- ***Circular design models:*** Kenyan private sector to embrace eco-design, select and transform their industrial processes, supply chains, materials, and products using the 4Rs and whole system assessments for purposes of optimizing the degree of closing material loops, minimizing raw material extraction and waste generation, and enabling re-integration of materials into natural biogeochemical processes at end-of-life, through continuous process nurturing, accelerated innovation and phasing out of unsustainable practices so as to assure a sustainable circular society.
- ***Sharing Business Models***
Kenyan business to adopt increased product utilization rates through their shared use, access, and ownership of shared services.
- ***Product Service Systems (PSS):*** Business in Kenya to prioritize product service systems (PSS) while retaining product ownership with a view to helping them internalize the benefits of circular resource productivity through innovative actions such as leasing, renting, and paying-for-use in a functional economy;
- ***Product Life Extension:*** *Business in Kenya to* , extend the working life cycle of their products and components (producing for durability/ longevity) through repair, upgrading, re-manufacturing, refurbishing and re-selling;
- ***Resource Recovery:*** Kenyan businesses to recover useful resources/ energy out of disposed products and by-products as a way of seeking to transform waste into valuable inputs;
- ***Regenerative Business Models:*** *Business in Kenya to* increase the use of renewable energy in business operations. scale up composting of organic materials, increase tree cover the reciprocal flow of materials between nature and society with rates of resource extraction and return to the environment being lower than the regenerative and absorptive capacity of the Earth;

34 Delphi Group, 2017. Jurisdictional Scan for the Circular Economy, Report of the Ministry of Environment, British Columbia

- ***Closing of Material and Supplier Loops:*** Business in Kenya close of material loops and establish reverse logistics of products and packaging. Extended Producer Responsibility establish schemes that hold producers responsible for the collection and waste treatment costs of their products, while incentivizing them to invest in waste prevention and reuse. Closed loops will enable Kenyan businesses remanufacture, refurbish, and reuse used products and materials upon recovery for purposes of giving them a new lease of life;
- ***Data for Closing of Material and Supplier Loops: Business in Kenya to*** develop accurate input/ output, waste and by-product data bases that will aid industrial symbiosis and closure of material and supplier loops using strengthened reverse logistics capabilities.
- ***Greening of Internal Operations: Business in Kenya to*** promote resource sufficiency; energy, waster, and materials use efficiency; as well as dematerialization along the entire life cycle of production and consumption with a view to decoupling progress from unsustainable forms of material use;
- ***Value Recovery Business Models:*** business in Kenya to re-introduce residual materials into their production processes for the re-formulation of new products as a way of reducing pressure on the use of virgin raw materials while also reducing greenhouse gas emissions;
- ***Install Virtualization and Internet of Things (IoTs):*** To empower Kenyan businesses reinvent the way they keep track of their levels of material consumption, reusability of products, interaction with different actors along the supply chain in order to support reverse loop strategies and engage with consumers beyond the point of sale using internet of things (IoT), trace and return systems, mobile apps, digital sharing platforms, big data, and digital substitutes like cloud computing;

7.9. Green Marketing Strategy

Retailers and developers of green products emphasize product offerings that are environmentally friendly³⁵. Thus, products such as organic vegetables, recycled paper, and phosphate-free detergents are referred to as green products. This definition of green marketing emphasizes product offerings that are not harmful to the environment, but it does not address the production processes employed to prepare the products (Dahlstron, 2010). Social marketing adopts a different vantage point and defines green marketing as the development and marketing of products designed to minimize negative effects on the physical environment. In contrast to the retailing perspective, the social orientation recognizes the pre- and post-consumption costs to the environment. Green marketing management is therefore defined as the process of planning and executing the marketing mix to facilitate consumption, production, distribution, promotion, packaging, and product reclamation in a manner that is sensitive or responsive to ecological concerns (Dahlstron, 2010). Initial green marketing efforts focused on the recycling of products such as aluminum cans and photocopier toner cartridges. Over time, firms have begun to

³⁵ Dahlstron, R., 2010. Green Marketing Management

consider ways to modify inputs to production that limit the influence of the products on the environment (Dahlström, 2010). Green products are recognized nationally or internationally through certification and eco-labeling.

A promising green marketing strategy should therefore be based on a functional and trusted eco-labelling scheme that is thoroughly understood by all stakeholders especially the consumers who will use it to make informed green consumer choices. Through concerted awareness raising sessions, it should be easy for the consumer to make an informed green choice with the help of the eco-label. It represents a voluntary, participatory, market-based economic instrument that provides reliable information about environmental credentials of any given good or service. For Eco-labels, changes in buying habits are what deliver the benefits. Apart from creating an enabling eco-labeling regulatory framework and subscribing to green public procurement, the Government should also therefore set up strong standards and research institutions with well-equipped laboratories to help handle product analytical aspects of eco-labeling from the life cycle perspective (need to have product environmental attributes verified against the relevant certification criteria before being awarded the right to carry the eco-label). Civil society groups should use their advocacy sessions to raise the awareness about eco-labels and also have their own independent laboratories with analytical capacity to help fight the green washing menace. Business associations can also serve as pressure groups for accelerating the culture of green consumerism.

Environmental labels work on the basis of informing buyers (private and institutional) about the environmental attributes of the related product or service, thus encouraging or persuading behaviour change; have the potential to deliver economic benefits to those companies that effectively market on environmental grounds, thus, in effect, buying behaviour change; and causes companies losing market share (because of lack of credible environmental credentials) to improve their products, thus, in effect, forcing behaviour change (EU, 2011). There is need for clear roadmaps leading to the direction of mutual recognition between eco-labelling schemes and increasing the cooperation between developed and developing countries. This should help contribute to increasing reliability of eco-labels as a marketing instrument and support efforts towards the simplification of the 'eco-labelling universe', which will eventually benefit both producers and consumers. Small-and-medium sized enterprises in emerging economies need more and better information about technical standards and marketing requirements in various export countries to meet eco-label requirements. Consumers both individual and institutional should become more aware about hidden impacts of goods and services to make their informed choices thus providing market pull for behavioural change at all levels.

Different kinds of environmental information systems are being used by a wide range of companies to promote their products. The objective here is to encourage consumers to buy the products for their environmental attributes. Eco-labels can serve as a form of environmental credential that can be used in promoting both the company, as well as the product. In this type of application, environmental labels are therefore marketing or sales tools. They work in concert with the usual purchasing decision issues of price and quality (including performance, durability,

and other features that relate to appearance, status etc.) Two of the main elements of any type of product related marketing strategy are: assessing the target audience for the marketing efforts and getting the messaging right.

The purpose of identifying the target audience is to help determine its main likes, dislikes, orientation, and any possible predisposition. This in turn helps to better craft the right green message. In terms of environmental marketing, the kinds of things that should be reviewed in terms of target audience include the likely age grouping for the product category, this group's environmental orientation in terms of knowledge, interest and probability to be swayed by environmental messaging. The right messaging should aim to inform the audience about the environmental aspects of the product; as well as identify that the product has superior environmental leadership characteristics relative to other competing products.

Regardless of the decision, the following marketing principles are useful guides: be cautious about highlighting one environmental attribute, while ignoring other potentially more significant environmental attributes; ensure that any claims are, as a bare minimum, verifiable (often the best approach is to have an independent party verify claims); avoid any claim that is non-specific or vague; ensure that claims are relevant; avoid promoting the environmental aspects of a product that is, by definition, harmful to the environment, just a bit less so than competing products; and be truthful and avoid green washing false claims (EU, 2011). Some of the well known and accepted eco-labels include the US energy star label awarded to the most efficient models of electrical goods; the EU flower that covers a wide range of products and services, the Forest Stewardship Council (FSC) that shows that wood and wood products come from sustainable sources, Marine Stewardship Council (MSC) that is the equivalent of the FSC for marine products, and Green Globe 21 for Tourism destinations.

7.10. The Status of Green Markets in Kenya

Government is the greatest buyer of goods and services in any country. If the Government therefore chooses to purchase green products through green public procurement (GPP), then the private sector will have no option but to eco-innovate so as to positively respond to the Government's move. By using its purchasing power to opt for goods and services that respects the environment the Government can make an important contribution towards sustainable development. Green Public procurement covers areas such as the purchase of energy efficient computers and buildings, office equipment made of environmentally sustainable timber, using recyclable paper, electric cars, environmental friendly public transport, consuming organic foods, using electricity stemming from renewable energy sources, and air conditioning systems complying with state of the art environmental solutions (UNEP DTIE, 2009). By promoting green procurement, public authorities can provide industry with real incentives for developing green technologies. Through GPP, Governments and Corporates will be able to offer solutions to a wide range of environmental challenges that include climate change and energy efficiency, waste and recycling, transportation, sustainable construction, organic food, as well as social issues, like labour standards, fair trade, and gender equality³⁶. Environmentally responsible or

36 UNEP DTIE, 2009. Enabling Developing Countries to Seize Eco-label Opportunities: Capacity Building and Technical Assistance for Industries and Governments in Developing Countries

'green' procurement is the selection of products and services that minimize environmental impacts. It requires a practicing company or organization to carry out an assessment of the environmental impacts of a product at all the stages of its lifecycle (UNEP DTIE, 2009).

This means considering the environmental costs of securing raw materials, and manufacturing, transporting, storing, handling, using and disposing of the product. Environmental considerations might include the reduction of greenhouse gas emissions and air pollutants; improved energy and water efficiency; reduced waste and support for reuse and recycling; use of renewable resources; reduced hazardous waste; and reduced toxic and hazardous substances. In addition to environmental concerns sustainable public procurement (SPP) also incorporates social considerations, like gender and ethnic equity; poverty eradication; and respect for core labour standards. If considering life cycle costs of any contract, GPP allows to save money and protect the environment at the same time (like save materials and energy, reduce waste and pollution), and encourage sustainable patterns of behavior (UNEP DTIE, 2009). The main barriers to GPP are high upfront costs, lack of environmental knowledge and information, lack of managerial and political support, inadequate training, and lack of tools. The Ministry of Environment and Forestry is at an advanced level of publishing GPP rules and Regulations. Kenya's switch to GPP will entail a review of the procurement award criteria, the training of procurement officers in green public procurement, establishment of a functional eco-labelling scheme that will ease the selection of green products as well as the development of an enabling set of green rules and regulations.

Companies that produce environmentally benign products can leverage on green marketing as a form of tapping into the country's emerging green consumerism culture. Green marketing depends on the easier selection of environmentally benign products and eco-labels serve this purpose.

CHAPTER NINE: VERIFICATION AND REPORTING OF GREEN BUSINESSES AND PRODUCTS

8. Voluntary Sustainability Standards

"Voluntary sustainability guidelines" is often used interchangeably with "voluntary codes of conduct". As its name suggests, voluntary sustainability guidelines are guidelines adopted by corporations on their own, without any form of coercion, to improve their sustainability performance³⁷ (UNEP, 1996). Corporations have different rationale for voluntarily adopting codes of conducts. Some of the motivations, discussed intensively in scholarly literature are: signalling commitment to address societal issues such as the environment for purposes of showing good corporate citizenship; demonstrating over-compliance in order to prevent hard laws and regulations being put in place; development of a level playing field with regard to sustainability issues; protecting the organization's reputation or image; application of 'standardized' approaches to sustainability issues; sustainability risk management; and stakeholder pressure on businesses to manage sustainability issues properly (UNEP, 1996). Therefore, on a voluntarily basis an organization or group of organizations can choose to

³⁷ UNEP, 1996. Voluntary Industry Codes of Conduct for the Environment

subscribe to the promotion of green and circular economy ideals through the development of a voluntary code of practice that advances the goals of sustainable development.

Industry finds voluntary codes to be an attractive alternative to enforced regulation, and indeed often proposes such codes in an effort to pre-empt regulation (UNEP, 1996). According to UNEP, the objectives of such a voluntary code of conduct are to: serve as a catalyst for dialogue between government agencies, industry sectors, community interests, environmental NGOs and other stakeholders in sustainable industrial development; create an awareness within industry and government of the importance of green and circular economy practices in furthering the ideals of sustainability; sensitize the general public on the economic and environmental benefits of going green; and encouraging cooperation among industry players, academia, Government and civil society. The magnitude and urgency of the sustainability risks faced by organizations demand that firms provide complete information regarding their financial, environmental, and social performance³⁸. If the firm offers complete disclosure of its actions as they relate to sustainability, stakeholders can make better decisions (Dahlstrom, 2011).

Transparent disclosure enables sustainability reports to be used for three purposes, namely demonstration, benchmarking and comparison³⁹. Firms demonstrate their commitment to sustainability by illustrating how the firm influences and is influenced by sustainable development. Benchmarking on the other hand refers to the comparison of a firm's performance in relation to the applicable laws, codes, norms, and voluntary initiatives. Comparisons enable firms to illustrate changes in sustainability performance over time. The Global Reporting Initiative uses four criteria, namely materiality, stakeholder inclusiveness, sustainability context, and completeness to guide the development of sustainability reports (Global Reporting Initiative, 2006): With respect to materiality, firms should use both internal and external factors to determine whether information is material enough. These factors include the firm's mission and competitive strategy as well as the concern expressed by stakeholders.

Stakeholder inclusiveness requires the firm to identify all the interest groups and to report on how they have responded to the group's expectations and interests. Such interest groups include employees, suppliers, customers, NGOs, governments, and other groups with vested interests in the firm's sustainability efforts. The sustainability context criterion ensures that the organization explains how it is meeting the demands of achieving sustainability. Completeness refers to the provision of sufficient information about economic (reviews of financial performance, local market presence, and indirect economic influences of the firm), environmental (the extent to which the actions of the firm is associated with material usage, energy, water, biodiversity, by-products and waste, products and services, compliance, and transportation), and social performance (reporting on human rights, labor practices, product responsibility, and society) to enable stakeholders to make informed decisions. Firms need to consider their broad supply chains in this regard and examine the influences of upstream suppliers, employees, and downstream customers (Dahlstrom, 2011).

³⁸Dahlstrom, R., 2011. Green Marketing Management

³⁹Global Reporting Initiative, Sustainability Reporting Guidelines, (Global Reporting Initiative, 2000 - 2006)

8.1. Sustainability Reporting

The benefits of sustainability reporting include⁴⁰ increased discipline about environmental performance; conveyancing of a strong environmental message to all stakeholders; ability to track progress versus targets; reduction of environmental risk; identification of savings and efficiencies; and identification of new green business opportunities. The three main elements of a sustainability report are (Summary of Corporate Sustainability Strategy - strategy and analysis, organizational profile, reporting on parameters, governance, commitments, and engagement); (Performance Indicators - economic indicators, environmental indicators, and social Indicators) and Third-party Validation (Dahlstrom, 2011). Although many firms have established procedures for determining sustainable action, assurance is significantly enhanced via evaluation by some entity external to the organization. In reporting on third-party evaluations, firms indicate that the evaluation is performed by an external party that uses individuals who are not limited by their relationship with the firm. The third-party report should be completed by persons competent in the subject matter and related practices (Dahlstrom, 2011).

8.2. Natural Capital Accounting

There is need for the adoption of Ecosystem and Natural Capital Accounting (ENCA) initiatives that provide coherent frameworks for the integration of natural wealth into the country's System of National Accounts (SNA) through the use of the System for Environmental-Economic Accounts (SEEA). This quantification of the state of natural capital stocks will enable its monitoring over time that is an important step towards the alignment of market prices to fully account for externalities.

Natural Capital Assessments, and the related process of natural capital accounting, are tools with which a country's natural assets and resources can be measured and managed (WAVES, 2015). They consider what assets and services nature provides, and how they can be best used without damaging or depleting them.

CHAPTER TEN: ROADMAP FOR THE IMPLEMENTATION OF GREEN AND CIRCULAR ECONOMY BUSINESS FRAMEWORK FOR PRIVATE SECTOR IN KENYA

9. Transitioning to a Green and Circular Economy

While planning for this green transition, the Kenyan Government should adopt an integrated green policy approach that targets sustainability and efficient resource use (UNEP, 2014). Such an approach should focus on greening key economic sectors of the economy that includes agriculture, waste, energy, water, tourism, industry and transport among others. Just like in China, this Kenyan roadmap could be based on promoting the overall circular economy concept across key sectors of the economy by focusing on the 4Rs of reducing, reusing, recovering and recycling through: decoupling of environmental degradation from economic development; promoting sustainable consumption and production; embracing Cleaner Production and polluter

⁴⁰ Ans Kolk, 2000. Green Reporting, Harvard Business Review, 78(2000): 15 - 16

pays measures; Consumption reduction of resources, emissions and waste minimization in general; and Waste prevention, reduction, reuse, recovery, and recycling (UNEP, 2014).

The 4Rs could be integrated and scrutinized throughout a broader system that encompasses all key sectors and main natural resources of the country. At the same time, measures could be taken to mitigate possible negative side effects including job reductions that might face some sectors while implementing the transition to a Green Economy (UNEP, 2014). The success of a national Green Economy policy approach requires more than highlighting possible benefits of a Green Economy or proposing green interventions and possible enabling conditions. Decision-makers need to identify, communicate and adhere to a set of principles and guidelines while planning and formulating a successful transition to a Green Economy. Possible guiding principles for a Green Economy framework for Kenya includes actions on (UNEP, 2014):

Just a minority of companies in Kenya have vision, mission, and strategic plans that truly reflect the green and circular economy models that they are currently implementing. Proactive company executives should be willing to appreciate the fact that businesses operate in an ever-changing environment, where strategies need to be continually re-shaped according to the latest opportunities and threats in the industry, shall focus on monitoring the complex context in which their companies operate, at both business and societal levels (Tonelli & Cristoni, 2019).

Thus, identifying and exploring the existing strategy in order to identify the points of intervention and forecast the future is the first step of a company's journey towards a circular model. A deeper understanding of the current strategic plans and planning processes is, in fact, essential for envisioning a CE strategy for the firm. The fundamental steps of the strategic process of accelerating the adoption of circular economy practices at both national and county governments are identification of the current circular economy (CE) situation, CE data analysis, determination of the preferred CE position, Gap Analysis, before final strategy formulation and planning (Tonelli & Cristoni, 2019):

The proposed model below illustrates a standardized, cross-industry process for the assessment and definition of a CE strategy for an organization (Figure 38).

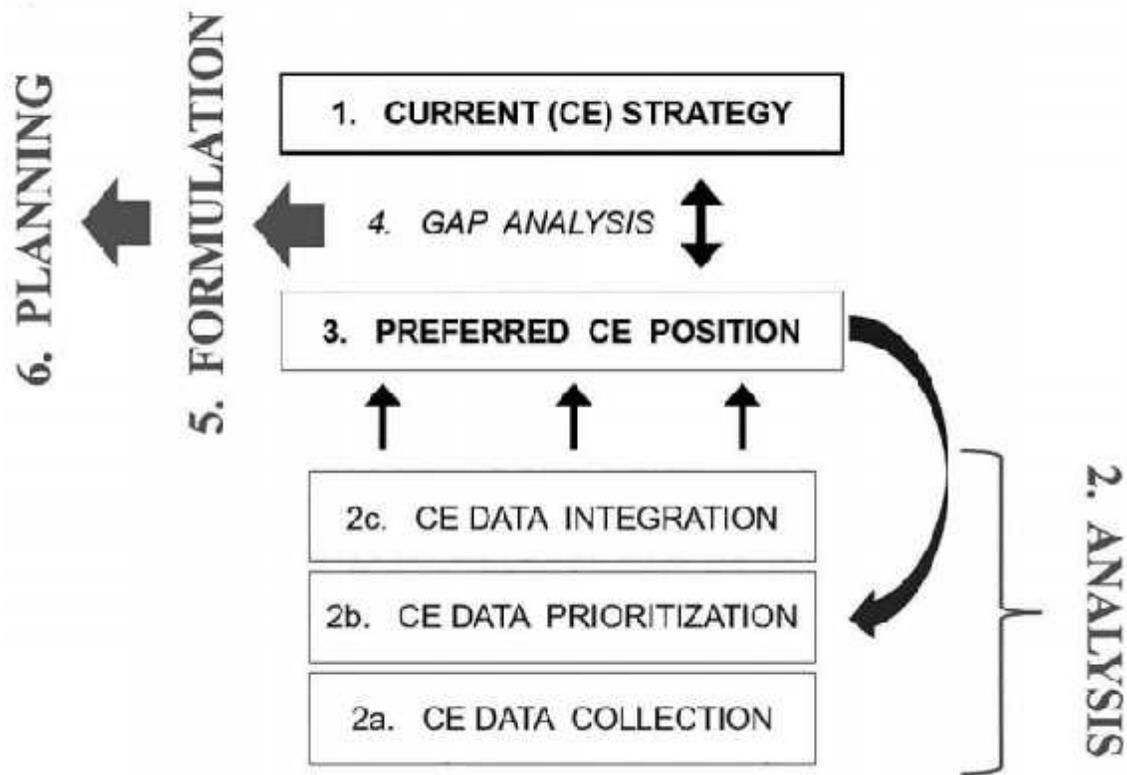


Figure 38: The CE Strategic Model Process

Source: (Tonelli & Cristoni, 2019)

- i. **Identifying Current Situation:** A thorough assessment of the current strategy is crucial for understanding where a business stands in its circular journey and what steps shall be prioritized when laying down a preferred CE strategy. If, for example, a company has never embarked on a CE project before (no seeds of circularity), a pilot involving only a tiny fraction of the business would be highly recommended to test the firm’s readiness. Amongst the tools that can be used to investigate the current strategy of a company, the idea tree is a valid option to help identify potential CE opportunities;
- ii. **Determining Preferred CE Position:** The scenario resulting from having examined, prioritized, and integrated all the data will reveal the CE strategic options available. At this stage, the strategic quadrant can help a company choose its ideal positioning in the industry, hence determine its preferred CE attitude;
- iii. **Gap Analysis:** The current and ideal positions of a company hardly concur, especially when circular principles are at stake. Hence, there will be a gap to be closed. In those cases when the gap is just too big given the actual CE readiness of the company, data will need to be rearranged (in terms of prioritization) so that an alternative “preferred CE reality” can be envisioned and assessed;
- iv. **Strategy Formulation and Planning:** The final steps of the process involve deciding on a CE strategy, hence proceeding to its formulation, planning, and eventual

implementation. Central to this framework is the relationship between the current strategy of the firm and the preferred CE position that results from a thorough data analysis of the firm, its industry and wider context (Tonelli & Cristoni, 2019). The eventual gap between the two points represents the area around which to formulate and plan the implementation of a new strategy (Tonelli & Cristoni, 2019).

v. **Internal Alignment**

In addition to working closely with suppliers, any company embracing CE principles would need to manage the widespread implications cutting across functions such as R&D, product design, green procurement, accounting, marketing, sales, and operations. A change in culture touching all levels of the organization is to be centred around some key aspects that include (Tonelli & Cristoni, 2019):

- ***Secure Buy-in from executives and senior stakeholders.*** When a CE project is initiated by the sustainability or CSR department of an organization, early approval from top management is vital, not least to secure the necessary funding as well as internal support for the entire duration of the project.
- ***Getting managers and employees on board*** by motivating them to embrace change. Communication *about* both structural adjustments in the company and the many benefits (financial and environmental, long and short terms, etc.) deriving from the new circular strategy will have to be frequent and complete. Between 2014 and 2015, Unilever launched several training programmes to help selected management teams familiarize with CE principles and to inform them of the existing projects within the company that already embraced circular thinking (Tonelli & Cristoni, 2019).
- ***Strong cross-departmental alignment*** over the new strategic principles is also key, especially among design, marketing, sales, and operations. Those are in fact the *departments* where most disruption is generally anticipated, as: products will be designed to last longer and be shared between users; sales people will need to be instructed on how to manage the transition towards servitization; and marketing will be asked to find ways to effectively communicate all of those changes to the public. Perhaps most importantly, teams specialized in CE operations like disassembly⁴¹, refurbishment, and re-manufacturing will need to coordinate with designers so that products can be devised for easy dismantling and further processing of reusable components (Tonelli & Cristoni, 2019).

vi. **External Collaboration**

As most businesses are still at the beginning of their circular journeys, collaboration with external stakeholders can help bring multiple benefits, especially in industries where CE

41 Peiró Laura, Fulvio Ardente, and Fabrice Mathieux. 2017. “Design for Disassembly Criteria in EU Product Policies for a More Circular Economy.” *Journal of Industrial Ecology*. 21 (3): 731–41.

implementation is particularly difficult (e.g. due to complex and dispersed supply chains⁴² or heavy reliance on virgin materials). This is due to the fact that requirements for circularity goes beyond the company boundaries. Moreover, transitioning towards a new circular business model⁴³ is likely to impact the organization well beyond its traditional boundaries and current operations. Hence, for many firms, implementing a circular strategy will inevitably mean collaborating with a complex web of old and new stakeholders – as opposed to managing standard transactions in a linear fashion.

Industry partner associations can act as enablers for sharing best practice and mutual support.

NGOs and other not-for-profit organizations might also support businesses in applying circular principles to their operations. They can also serve as pressure groups that help drive the much-needed green transition.

Policymakers at all levels (international, national, regional, and local) can act as catalysts for change by supporting businesses towards circularity.

Research centers and universities are valuable partners to engage when a business needs to devise technical and eco-innovative solutions for the implementation of circular operations.

Specialized Niche Organizations operating in material recycling, waste management, or resource use efficiency can be valuable for those businesses that still lack the full set of capabilities required to take full advantage of a CE strategy and/or satisfactorily address a negative environmental externality. International Synergies runs a free business network to help with knowledge and ideas on how to address resource efficiency challenges.

SECTION III: ENABLING ENVIRONMENT

CHAPTER ELEVEN: ENABLING ENVIRONMENT FOR ACCELERATION TO GREEN AND CIRCULAR ECONOMY

10. Incentives of Competitiveness and Consumption of Green Products

Positive incentives are for example price reduction for secondary products, tax reductions and negative incentives for example penalties for not adequate waste collection, and charges and restrictions for the landfilling and incineration of waste (EIT, 2020). Mostly the analyzed incentives are positive, encouraging the target groups to transition towards circular economy. Some incentives include both positive and negative aspects, e.g. deposit schemes can be

⁴² World Economic Forum (WEF). 2014. “Towards the Circular Economy: Accelerating the Scale-up Across Global Supply Chains.

⁴³ Jonker, Jan, and Niels Faber. 2017. “The Circular Economy - Developments, Concepts, and Research in Search for Corresponding Business Models.”

voluntary but opting out would lead to tax increase (EIT, 2020). Table 18 below presents a summary of the eight main circular economy incentives.

Table 18: Summary of the Circular Economy Incentives

CE Incentive category	Description
Technological incentives	Incentives aiming to speed up the development of different technological solutions and innovations for circular economy
Educational incentives	Incentives aiming to increase knowledge and awareness on resource efficiency and circular economy. Education can raise awareness on the need for and benefits of a circular approach as opposed to a linear approach to production and consumption.
Social incentives	Incentives and activities aimed at engaging consumers and the society at large in circular economy. Awareness raising is an important area. Campaigns and other awareness raising tools can be used to engage consumers more in repair and reuse of products.
Regulatory incentives	Regulations related to implementation of circular economy. Examples include eco-design, waste and extended producer responsibility.
Institutional incentives	Institutional incentives include policy measures, strategies, roadmaps that aim to promote circular economy implementation. Policy will have a central role in achieving improved handling of materials and implementation of circular economy principles.
Market conditions	Incentives to create markets for secondary raw materials, repaired, reused and remanufactured products.
Fiscal incentives	This category includes fiscal incentive such as taxation, subsidies, financing, and internalizing the cost of externalities. Starting point should be identifying and eliminating subsidies that are harmful for the environment.
Industrial arrangements	Industrial arrangements incentives refer to activities aimed to facilitate collaboration and partnerships in circular business. Enabling and rewarding value chain collaboration is needed to align interests of partners

Source: EIT, 2020

The following incentive actions that fall in the categories of technological, educational, social, regulatory, institutional, market conditions, fiscal, and industrial arrangements will be relevant for the promotion of an accelerated uptake of circular economy activities in Kenya. They include take-back incentives, monetary incentives, mechanisms to cause reduction of labour costs (lowering labour taxes); legislative, legal and regulatory frameworks; Extended Producer Responsibility; Tax incentives; legal waste definitions affecting product end-of-life; skills development (training and educational activities) - e.g. training for refurbishers; obligations to provide spare parts, obligations to provide product information to repairers, refurbishers, and remanufacturers; enforcement of longer warranty periods for consumers; support to innovative, circular economy-focused business models; development of infrastructure for consumers to hand in used products; introduction of material efficiency and durability in product design regulation; legal framework to facilitate trade of repaired and refurbished goods; reduction of value-added tax (VAT) for refurbished products; and creation of subsidies for reuse that could help reduce operational costs and assist reuse operations (EIT, 2020).

10.1. Role of Government in Providing an Enabling Environment for Business Transition to Green and Circular Economy

The Kenyan Government should support promising green and circular businesses, at start-up(seed) and scale-up phases, through a combination of policy measures, strategies and concrete initiatives designed to give entrepreneurs the opportunity to establish successful and sustainable business cases. The desired overall goals should be to remove (legal and regulatory) barriers for green and circular start-ups to scale up; create more opportunities for networks and partnerships, knowledge transfer and skills; facilitate access to finance; and increase their visibility and market access.

- ***Create a supportive regulatory framework for sustainable businesses:*** by adopting a clear definition of “sustainable businesses” in legislation that will make them eligible for potential tax benefits and other incentives. The EU sponsored SwitchMed framework defines, a sustainable business as one that provides innovative viable products and services that create environmental value (addressing ecological challenges and reducing environmental impacts) and social value (addressing social needs) by applying eco-innovation, life cycle thinking and eco-design approaches”.
- ***Develop sustainable product policies and stimulate the application of circular design:*** There is need to stimulate the application of circular designs in Kenya’s manufacturing sector and imported goods, extending product lifespans, designing for reuse, repairing, remanufacturing and recycling for instance through a ban on planned obsolescence and mandatory percentage of recycled material in products. This will require the development of a new legislation.
- ***Promote and enable national and subnational partnerships aimed at supporting green and circular business development.*** National Partnerships should be set up by bringing together Public and Private Business Development Service Providers (BDSP) providing various support services to Green and Circular Entrepreneurs (training, mentoring, incubation, technical assistance, financing, etc.). These national partnerships could be voluntary associations of public and private actors that cooperate on green business development services designed to achieve a mutually agreed-upon objective which could potentially benefit all the involved parties by making resources, skills and knowledge readily available. In this regard, the BDSP should be comprehensively strengthened to provide business support services for the creation, incubation and acceleration of green and circular businesses. On-going work being developed under Switch Africa Green should help in triggering a conducive national support ecosystem for green and circular economy entrepreneurs and therefore serve as a basis for the formal establishment of national partnerships.
- ***Fiscal incentives for green and circular businesses:*** investments in ecological business assets that help transform conventional businesses into green and circular businesses, should be eligible for tax benefits. This could mean that registered companies are allowed to deduct their investments (purchase/production/modification costs) up to a certain percentage of their capital outlay from taxable profit. The criteria for technologies and

assets to be considered ecological should be developed, evaluated and approved by a government agency, published and updated on a regular basis. In addition, small SMEs may also deduct environmental consultancy that is needed to make a real transition to a green and circular business model.

- ***Strengthen Public-private partnership for better waste recovery and recycling:*** PPPs have emerged as an alternative to improve municipal waste management and waste recovery with privately owned companies. They already exist in Kenya. These PPPs can help attract private capital and technical expertise from private entities to support public authorities in achieving their waste management objectives and boosting the recycling market. These PPPs should be well structured to help lead to significant improvements in the efficiency and quality of solid waste management and should also consider improvements at the product design stage to increase recyclability.
- ***Create a regulatory helpdesk (online and offline) to support green and circular entrepreneurs:*** by appointing a department (with management commitment and sufficient resources), within an appropriate governmental institution, to support green and circular businesses and help remove regulatory obstacles for innovative circular entrepreneurs. A Helpdesk could take the shape of an online portal where entrepreneurs report regulatory obstacles that hinder them from investing in green and circular innovations. The helpdesk also requires sufficient human resources to analyze the case studies and provide concrete assistance to entrepreneurs, aiming to resolve the obstacles and improve the existing regulatory framework in collaboration with the responsible ministries. The online platform should also provide clear and gender inclusive information about the fiscal regime and benefits available to green and circular entrepreneurs, and how to access them.
- ***Establish clear end-of-waste and by-product criteria:*** in Kenya, waste legislation needs to be revised to enable the use of residual flows as secondary raw materials. Classifications with clear definitions and technical guidelines are needed for: i) waste, ii) by-product, iii) end-of-waste (as for example the “Waste, or not waste” tool developed in the Netherlands). Small green and circular businesses particularly benefit if they do not have to face complicated rules but are able to receive and process residual streams without a lot of bureaucracy and costly licenses. Social organizations should easily be able to receive second-hand products and materials (e.g. WEEE, furniture) and prepare or pre-process them for reuse and repair. It is necessary to develop standards for recycled products and secondary raw materials in order to guarantee optimal quality and safety of use.
- ***Establish Extended Producer Responsibility schemes (with eco-modulation of fees):*** Effective EPR schemes should be established for at least e-waste, batteries, end-of-life vehicles, packaging, textiles (incl. carpets) and furniture among others. As a minimum, EPR schemes should cover the costs of separate collection, sorting and waste treatment as well as the disposal of waste, litter cleaning and waste transport. However, EPR systems should not only stimulate recycling alone, but also circular strategies higher up in the waste hierarchy, particularly preparation for reuse and repair. This requires collaboration

with green and circular businesses that are specialized in preparation for reuse and repair. Furthermore, EPR fees of producers could be differentiated with eco-modulation fees to help reward and favour circular designed products.

- ***Waste disposal Fiscal Incentives taxes:*** Landfilling and incineration of waste causes significant pollution of surface water, groundwater, soil and air while emitting GHG emissions. There is therefore need to prevent or reduce the negative effects of landfilling or incineration. To reduce the amount of waste (and thus resources), tax disposal charges are a fiscal instrument that make it less economically attractive to landfill or incinerate, creating an incentive to invest in reuse and recycling. The tax revenues can be reinvested in improved inspection, waste prevention programs and mitigation of environmental impacts. In order to prevent circumvention of waste disposal taxes by illegal dumping, strict inspection and control measures are needed.
- ***Green Free Zones providing incentives to green/circular SMEs and Eco start-ups:*** this could be implemented through tax exemption, no import licensing requirements, minimal customs formalities, etc. These free zones can apply a green policies framework developed and approved by an independent committee/ industrial research institute.

10.2. Capacity-building & knowledge dissemination

Improved levels of knowledge and skills are needed on a broad variety of topics to enable the transition to a circular economy, e.g. concerning material flows (sustainable resources management), ecodesign, circular business models, reuse systems, repair skills and recycling technologies. The exchange and dissemination of knowledge in networks are essential for concerted action, but also the development of new skills and competences that are necessary for circular action on the ground. It is not only important to train the new generation but also public and private decision-makers (business leaders, politicians and financial actors) regarding circular economy. This calls for support structures and measures.

- ***Create or support incubation and acceleration programs*** for new entrepreneurs or existing businesses to develop green and circular business models with a focus on youth and women. These should incorporate modules specifically focusing on circular design, as well as guidance to develop successful business plans. Such a program could include access to business mentors, investors and partners from established companies looking for synergies.
- ***Encourage educational institutions to integrate circular economy modules in curricula,*** both dedicated courses as well as incorporated in existing courses, to help give rise to a new generation of circular informed professionals. Educational institutions should also ensure that both men and women have access to academic and vocational education or training on circular business models, environmental technologies, renewable energy, etc.
- ***Provide targeted information, skills, networking and training on circular entrepreneurship to youth and women*** (to help stimulate women-led start-ups and SMEs): as men and women's needs and opportunities are different, support structures and capacity development programmes should include a gender perspective, providing men

and women equal access to advice on business development , training and mentoring, market opportunities and networking.

- ***Create national or regional knowledge centres or networks specialized in CE:*** disseminating knowledge on Circular Economy strategies and practices, to help encourage and facilitate their implementation among existing and new businesses. This can be achieved through an online platform that aggregates all relevant information on green and circular economy, from relevant policies to best practices to funding opportunities but also through national partnerships, like the famous Switchers Support National Partnership in the Mediterranean region (a “non-institutionalized voluntary association of public and private actors that cooperate on green business development services to help achieve a mutually agreed-upon objective which can potentially benefit all the involved parties making available resources, skills and knowledge”). A national or regional knowledge centre could encompass the following actions:

Provide professional training, content, tools and services on various topics e.g. circular design, circular business models (e.g. servitisation), circularity assessment, while making the connection with climate mitigation (e.g. energy saving). These trainings can be adapted to the economic sectors that are most relevant in the country;

Promote interaction and matchmaking: enabling stakeholders to exchange ideas and collaborate to solve specific circular challenges, strengthening the CE network at a national level;

Collaborate with international organizations for knowledge transfer.

Develop/offer an information system that supports companies to make sustainable decisions, based on Life Cycle Analysis and Life Cycle Costing, combining information on the economic and environmental (and social) impacts of products and services.

10.3. Access to financing and funding

- ***Foster the development of funding to green and circular businesses:*** green and circular start-ups often experience difficulties in accessing funding. This major barrier could be addressed through:

Public (non-reimbursable) funding: an overview of public funds available at different levels should be gathered and explained on a single platform to facilitate access. Environmental taxes levied over polluting activities and sectors can be a source of public environmental subsidies;

Provide public interest-free loans and design specific guarantee schemes covered by dedicated state funds. Facilitate the participation of state funds in Venture Capital Funds or other types of private vehicles;

Women often have limited access to credit and loans. It is important to put in place financial instruments to benefit women led and women-owned circular businesses. At the same time, awareness about gender barriers to accessing funding should be raised among relevant stakeholders;

Support the finance industry in the provision of Sustainable Finance by channeling private impact investments for the transition to a circular economy.

- ***Legally define green and circular economy activities eligible for green financing:*** The national government should devise a clear classification system that enables various financial actors, particularly private investors, to assess business models playing a key role in the transition to green and circular economy, starting with climate change mitigation and adaptation. This is paramount to ensure that investments meet robust environmental standards and are consistent with the Sustainable Development Goals and the Paris Agreement on Climate Change. In addition, financial market actors should disclose sustainability risks and impacts to increase transparency in the finance sector.
- ***Commitment and capacity-building in the financial sector:*** the national government should facilitate a voluntary agreement in the sector joint as well as concrete guidelines for financial institutions. The knowledge of financial actors about the environmental/social cost-benefit balance of circular business models should be improved through training and workshops. Financial products and risk management have to be adapted to the circular economy. Furthermore, stricter requirements should be formulated for linear businesses.
- ***Promote the development of alternative models of financing:*** such as crowdfunding, crowd lending and equity investments, promoting impact investment platforms that connect sustainable projects with small investors.
- ***Information on the analysis of trends regarding the progress of green and circular businesses*** should be made available to do a proper monitoring of the efforts deployed to support them and better inform decisions regarding their financial support.

10.4. Stimulate Consumer Demand

- ***Support green and circular businesses with reaching international markets:*** whilst local markets should be prioritized to minimize the carbon footprint, for markets where domestic demand is insufficient, green and circular businesses may need to export their products or services abroad to become viable. This can be facilitated in different ways e.g. by supporting certification/ verification programmes (e.g. ISO 14001) or labels (e.g. Ecolabel); fostering the strategic cooperation among trading blocks.
- ***Support awareness-raising campaigns on sustainable/circular practices among consumers:*** it is important to raise awareness about environmental issues and the importance of a circular economy in order to stimulate responsible behaviours and boost sustainable consumption patterns/ lifestyles, increasing the demand for green and sustainable products and services, focusing on waste prevention, reuse and repair. These public communication campaigns should be gender-sensitive (Evidence highlights that women are very well positioned to drive responsible consumption behaviours), accessible and appealing, developed and implemented by local environmental NGOs so as to reach consumers directly. Ideas for such specific campaigns include: *Second-hand First*: to change the perception of second-hand goods; *Right to Repair*: to stimulate repair of household objects; *Zero Plastic Challenge*: to reduce plastic consumption, particularly single-use items; *Zero Waste Lifestyle*: to prevent waste production; and *Healthy lifestyle and wellbeing*: integrate health and wellbeing considerations within environmental communication campaigns could further convince consumers to take action.

- **VAT Reduction or Exemption for Second-hand and Recycled Goods and Repair Services:** VAT has already been paid over second-hand goods in their first use phase and repair services are usually micro-enterprises at local level. These goods and services play a vital role in the CE, retaining value and preventing waste, but they experience difficulties to compete with linear models. To strengthen their business case, these goods and services should be eligible for a significant VAT reduction or exemption, making them more attractive for consumers.

10.5. Green Public Procurement

- **Make Green Public Procurement (and monitoring) mandatory practice across all government bodies:** Generally, GPP is normally a voluntary measure but to scale up its impact, it should be made mandatory at all governance levels, with concrete targets supported with annual monitoring. To implement circular procurement, pilot programs and voluntary public-private agreements between governments, businesses and NGOs should be implemented to co-develop circular criteria and embed these in procurement processes, particularly for product groups with significant environmental footprint.
- **Provide circular procurement training and support for national and county governments** to help drive structural change in standard procurement processes and increase demand for green and circular products and services. Circular procurement favours the reuse of products, components and materials and requires an integrated approach throughout the whole lifecycle as well as collaboration in the value chain to enable circular product-service systems and take-back systems. It implies that organizations adopt a more performance-based (e.g. pay-per-use) approach to procurement, based on functional specifications and circularity indicators (quantitative and qualitative). Create a helpdesk to offer professional assistance to public procurers to identify circular solutions.

10.6. Promote R&D and Innovation

As with other forms of innovation, most circular economy solutions go through development stages with varying degrees of risk. The Kenyan Government should implement policies to and promote technology transfer from R&D centres and support businesses to survive the early stage development phases.

- **Funding for research & innovation for the circular economy:** small and medium-sized businesses should be able to benefit from the available research & innovation resources and technologies, such as through collaborative laboratories (Colabs) for the Circular Economy. Special focus should be put on technologies or processes with a high Technology Readiness Level (TRL) that can reach the market sooner.
- **Define a national Research & Innovation Agenda for a Circular Economy:** defining real-life challenges and opportunities at a national level in the medium and long term (2030) to promote the preservation of natural capital, while boosting competitiveness and employment. An important component of such an agenda should be “living labs”, in which business, academia and NGOs co-design solutions and launch proofs of concept

and demonstration projects at local or regional levels, particularly aiming for a transformative effect, say in the urban environment. Circular initiatives should be encouraged in at least one of the existing accelerators or business support organizations in the country.

- ***Enhance data collection and knowledge production on gender aspects of circular businesses and the demand for sustainable products*** will provide essential evidence to adopt more equitable and inclusive policy measures and programmes in favour of sustainable job generation and sustainable consumption.
- ***Protect intellectual property of innovative green and circular businesses:*** The government should protect the entrepreneurs' intellectual property and encourage them to implement their innovative ideas while creating employment.
- ***Launch Circular Challenges:*** invite entrepreneurs to submit viable business cases that realize circular solutions for the socio-environmental challenges identified at regional or national level. By involving and gathering the expertise **of** the government early on, parties collaborate with a view to scaling-up circular innovations, by creating enabling conditions and requisite market demand (e.g. with government as the “launching customer”).
- ***Promote industrial symbiosis:*** to increase the valorisation of by-products and residual streams, thereby turning the waste of one company/industry into a resource for another. This requires a collaborative (often site-specific) approach and good coordination, sometimes by an experienced third-party (for instance a public agency) to facilitate the implementation. International cooperation can be sought with a focus on best practice sharing, peer-to-peer learning. Pilot projects in given regions (within a country), led by public agencies can be implemented as a means to understand the advantages and constraints, to determine the possibilities of optimizing the local use of material and waste flows and also the possibilities of pooling existing resources to demonstrate the advantages of the sharing economy.

CHAPTER TWELVE: COORDINATION AND TRACKING OF IMPACT OF GREEN AND CIRCULAR ECONOMY INTERVENTIONS

I. *Develop a National Circular Economy Strategy and Action Plan*

To coordinate *the* various *sectors and* to track *impact* there *is* need *to* develop *a* national Circular Economy Strategy *and* Action Plan: that outlines the general vision for circular economy (CE) at national level and encompassing quantitative targets and monitoring indicators to help create system conditions for maintaining resource value at their highest level while designing out waste – explicitly acknowledging the role of green and circular businesses. Additionally, the Government should formulate a CE Action Plan that details the practical measures that are required to help achieve the objectives of the national strategy, formulating concrete measures designed to actively support green and circular businesses through a wide range of policy instruments and strategies. Both the Strategy and Action Plan should be an interdepartmental

effort, so that circular principles are integrated across ministries as a shared agenda highlighting environmental, social and economic benefits.

II. *Set up and Operationalizing the Inter-Ministerial Coordination Unit*

Creation of an inter-ministerial coordinating mechanism to assure proper coordination between different sectoral ministries, monitor implementation of green strategies and action plans, evaluate outcomes, and be introducing corrective actions as deemed appropriate. Kenya needs to have a well structured green growth/ circular economy coordination unit to serve as a one-stop shop for all the efforts of transitioning to a circular economy. Such a unit should be as autonomous as possible and provide a unified and coordinated approach to the many circular economy initiatives that will emerge in the country. Current lack of coordination and communication in particular between Treasury and the Ministry of Environment and Forestry needs to be overcome. Dialogue between the ministries of National Treasury, Environment & Forestry and Industry, trade & cooperatives needs to set up a CE coordination unit that can structure future EU/Kenya CE collaboration projects and those related policies can be effectively enforced.

The existing National Technical Green Economy Steering Committee which was formed in the EU funded SWITCH Africa Green (Phase 1) and already includes National Treasury representation, could assist with the coordination and transitioning to “switching green” across different sectors and value chains and must be seen as a vital building block of the envisaged Coordination Unit. Even when the Kenyan government is not in favour of setting up a coordination unit, the cooperation between the aforementioned ministries needs to be improved so that a broadly supported and coherent CE policy is developed. Under current legislation, the counties in Kenya are responsible for setting up the waste management system. As a consequence, this is done differently in each county. Government officials at the national level acknowledge that there is a lack of awareness about CE at the county level and therefore, the national government should engage the counties more in conversations about the CE and mainstream circular principles into other national policies in which the counties are involved, such as the Green Economy Strategy and Implementation Plan (GESIP) as well as the NCCAP 2018-202

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