



Circular Economy in Africa-EU cooperation

Continental report

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CONTENTS

List of Figures	i
List of Tables	ii
Glossary	iii
Executive summary	v
1 Introduction	1
1.1 This report.....	1
1.2 Scope of the circular economy activities.....	1
1.3 Circular economy in Africa’s context	2
1.3.1 General developments in Africa	2
1.3.2 The circular economy: a necessity and an opportunity	3
1.3.3 Interdependence EU and Africa for the Circular Economy transition on both continents	6
1.4 Methodology.....	6
1.5 Reading guide	7
2 Status of the circular economy in Africa	9
2.1 Circular economy policies and legislation	9
2.2 Overall trends relevant to the circular economy	17
2.2.1 Trends in resource extraction and consumption	17
2.2.2 Trends and opportunities in key sectors	21
3 EU-Africa trade from a CE perspective	51
3.1 Overview of EU-Africa trade	51
3.2 Analysis of trade flows from a circular economy perspective	53
3.2.1 Linkages between trade and circular economy	53
3.2.2 Trade in products relating to the EU’s new CE Action plan	56
3.3 The impact of an EU CE transition on trade with Africa	62
3.3.1 Total African imports and exports	63
3.3.2 Imports and exports by sector	64
3.4 The role of CE in trade agreements, regulation and trade policies	66
3.4.1 Overarching trade agreements	66
3.4.2 Regional trade agreements	68
4 Impacts from shifting from a linear to a circular economy	73
4.1 Assessment of a CE transition in Africa through macro-economic modelling	73
4.1.1 Introduction	73
4.1.2 Methodological and data limitations	75
4.1.3 Economic impacts and benefits	76
4.1.4 Social impacts and benefits	77
4.1.5 Environmental impacts and benefits	78

4.2	A qualitative reflection on the impacts of a shift to a more circular economy in Africa	80
4.2.1	Economic impacts	80
4.2.2	Social impacts	82
4.2.3	Environmental impacts	82
5	The Circular Economy in EU-Africa cooperation	85
5.1	Relevant continental, regional and trans-national platforms for policy dialogue on circular economy	85
5.1.1	African Platforms	85
5.1.2	Global Dialogue Platforms	88
5.1.3	EU-Africa Dialogue Platforms	89
5.2	Development cooperation and financing support for the circular economy in Africa	91
5.2.1	Programmes and instruments that will frame EU-Africa Development Cooperation on CE	91
5.2.2	Trans-National Development Cooperation Projects on Circular Economy	92
5.2.3	Trans-National EU DFI financing of CE-related programmes/ projects in Africa	95
5.3	Research and innovation cooperation on circular economy issues	97
5.3.1	Frameworks for EU-Africa R&I Cooperation	97
5.3.2	EU-Africa Research and Innovation Partnerships	98
5.4	Cooperation between African and EU companies with circular business models .	99
6	Recommendations for boosting the CE through EU-Africa cooperation	103
6.1	Policy cooperation	103
6.1.1	Developing a CE-dedicated policy dialogue platform / EU-AU Task Force on the continental level.	103
6.1.2	The development of CE-specific policies and roadmaps	104
6.1.3	Knowledge transfer of political CE initiatives from the EU to Africa.	105
6.1.4	The internal coordination of CE initiatives on the part of the EU.	105
6.2	Trade cooperation	106
6.3	Development & financial cooperation.....	107
6.4	Research cooperation	109
6.4.1	Knowledge transfer and capacity building	109
6.4.2	Promote and encourage partnerships between research institutions & the private sector	110
6.4.3	Promoting international exchange programs with a particular focus on CE	110
6.4.4	Directions for further research and data availability	111
6.5	Business cooperation.....	111
	Annex A - Stakeholders interviewed.....	113
	Annex B - Important stakeholders in the Circular Economy in Africa	115
	Annex C - Methodology for the modelling	117
	Part 1 General approach to circular economy modelling.....	117
	Part 2 The impact of an EU CE transition on trade with Africa (section 3.3).....	119

Part 3 The impact on Africa of a CE transition in the EU and Africa (section 4.1) 122
Annex D - Trade codes construction materials 125

List of Figures

Figure 2-1 Domestic material consumption per capita by world region (tonnes)	19
Figure 2-2 Domestic material consumption in Africa by country, 2017	20
Figure 2-3 Domestic material extraction (dotted lines) and consumption (solid lines) in Africa by material type	20
Figure 2-4 Outlook for resource consumption in Africa in the Middle East under a business-as-usual scenario.....	20
Figure 2-5 Opinion of participants (N=347) of the CE in Africa session in the WCEF 2020 on CE priority sectors in Africa	22
Figure 2-6 R-framework showing different CE strategies in order of prioritisation (1 highest, 9 lowest)	24
Figure 2-7 Fertilizer use in sub-Saharan Africa and the MENA region compared to the global and EU average	26
Figure 2-8 Global plastic production [%]	37
Figure 2-9 Africa map: plastic waste generation, management and policies	39
Figure 3-1 CE-related interlinkages between domestic value chains and CE product and material cycles and global trade flows	53
Figure 3-2 Africa-EU trade in ICT products over the period 2010-2017	57
Figure 3-3 Trade restrictions on used vehicle imports in African countries.....	58
Figure 3-4 Plastic waste generation and shares of inadequately managed plastic waste by region	59
Figure 3-5 Overview Africa's textiles trade in 2017 (left) and imports of clothing in (new and used) (right)	60
Figure 3-6 Forecasted increases in demand for construction minerals in Africa	61
Figure 3-7 Africa-EU trade balance of construction products of the most commonly used metals	61
Figure 3-8 Change in total imports and exports to and from Africa.....	64
Figure 3-9 Change in imports to Africa	65
Figure 3-10 Change in exports from Africa	65
Figure 4-1 Absolute employment changes in CE scenario in most strongly impacted sectors (relative to the baseline).....	77
Figure 4-2 Total CO2 emissions in the baseline and the CE scenario.....	79
Figure 4-3 Absolute changes in CO2 emissions in CE scenario in most strongly impacted sectors (relative to the baseline).....	79
Figure 4-4 Africa's power generation mix in the CE scenario (2030)	80
Figure 5-1 Analysis of European CE businesses activities in African case study countries based on EIB Circular Economy Typology	100
Figure B-1 Stakeholder map	115
Figure C-1 E3ME linkages - flow diagram.....	118

List of Tables

Table 2-1 Overview of categorisation of policies integrating or supporting the Circular Economy	13
Table 4-1 Circular economy activities and corresponding modelling inputs	74
Table 4-2 Macro-economic impacts of the CE scenario	76
Table A-1 Overview of interviewed stakeholders	113
Table B-1 Stakeholders from the private sector	115
Table C-1 Scenario design - CE transition in the EU	119
Table C-2 Scenario assumptions	120
Table C-3 Scenario design - CE transition in the EU and Africa	122
Table C-4 Scenario assumptions	122
Table C-5 Mapping to E3ME sectors	124
Table D-1 Trade codes included in construction products in chapter 3.2.2.....	125

Glossary

ACEA	African Circular Economy Alliance
ACEN	African Circular Economy Network
ACP	African, Caribbean and Pacific countries
AEIP	Africa-Europe Innovation Partnership
AfCFTA	African Continental Free Trade Agreement
AFD	Agence France de Développement
AfDB	African Development Bank
AMCEN	African Ministerial Conference on the Environment
AGSP	African Green Stimulus Programme
AIP	Africa Investment Platform
ARDWE	Agriculture, Rural Development and Water
AU	African Union
AUC	African Union Commission
CE	Circular Economy
CEAP	Circular Economy Action Plan
COI	Clean Oceans Initiative
DFI	Development Finance Institution
DG INTPA	Directorate-General for International Partnerships
EABF	EU-Africa business forum
EAC	East African Community
ECCWLM	Environment, Climate Change, Water and Land Management
ECOWAS	Economic Community of West African States
EEAS	EU External Action Services
EEE	Electric equipment and Electronics
EFSF	European Fund for Sustainable Development
EIB	European Investment Bank
ELV	End-of-Life Vehicle
EPA	Economic Partnership Agreement
EPR	Extended Producer Responsibility
ESA	Eastern and Southern Africa
EU	European Union
EUDAU	European Union Delegation to the African Union
EUDEL	EU Delegations
FAO	Food and Agricultural Organisation
FNSSA	Food, Nutrition Security and Sustainable Agriculture
GBC	Green Building Council
GDP	Gross Domestic Product
GHG	Greenhouse gas
GSP	Generalised Scheme of Preferences
GTP	Generalised Tariff Preferences
HLPD	High-Level Policy Dialogue
InTex	INnovative business practices in the TEXtile value chain
IO Tables	Input-Output tables

JAES	Joint Africa-EU Strategy
KfW	Kreditanstalt für Wiederaufbau
LDC	Least Developed Countries
MSW	Municipal Solid Waste
MSs	Member States
Mt	Megaton
NDICI	Neighbourhood, Development and International Cooperation Instrument
NGO	Non-governmental Organisation
NIP	Neighbourhood Investment Platform
OECD	Organisation for Economic Cooperation and Development
ODA	Official Development Assistance
PACE	Platform for Accelerating the Circular Economy
PSS	Product Service Systems
	Global Network for Resource Efficient and Cleaner Production in
RECPnet	Developing and Transition Countries
RECs	Regional Economic Committees
SADC	Southern African Development Community
SB4A	Sustainable Business for Africa Platform
SCP /RAC	Sustainable Consumption and Production
SDG	Sustainable Development Goals
SME	Small or Medium Enterprise
STC	Specialised Technical Committee
STI	Science, Technology and Innovation
UNCTAD	United Nations Conference on Trade and Development
UNEP /MAP	United Nations Environment Programme
WCEF	World Circular Economy Forum
WEEE	Electric equipment and electronics waste

Executive summary

Africa and Europe have a long-shared history and the interdependence of the two continents is reflected in the vast trade relations between them. Existing challenges relating to climate change, the energy transition and the efforts needed to move human activities back within the planetary boundaries while at the same time improving the livelihoods of a large group of people, makes an intricate and close cooperation between Africa and the EU even more important. With its publication of the European Green Deal, including a new Circular Economy Action Plan, the EU reinforced its ambition to transform its economy from the existing linear “make-use-dispose” model into a circular one. The Green Deal also emphasises the importance of international cooperation, especially with neighbouring regions such as Africa, in order to reach the EU’s and global sustainability objectives. This report is a first step to identify how cooperation between the two continents can be fostered and adapted to accelerate the uptake of circular practices and promote the shift to a circular economy.

Circular Economy as Africa’s sustainable economic development strategy

Even though the concept **of circular economy has gained traction in the international community during the last decade, its application to the African context has been rather underexposed**. As such, this study on the role of Circular Economy in Africa-EU cooperation is timely and sheds light on the vast potential that the circular economy (CE) holds for sustainable economic development in African countries. **The CE is an opportunity for Africa** as it **synergises well with economic diversification as well as industrialisation** policies that are high on the continent’s political agenda. Furthermore, the CE provides a paradigm for the development of new economic activities, while it simultaneously addresses some urgent environmental and social problems in the continent, such as the growing problem of plastic waste pollution. Furthermore, the projected high population growth for the continent combined with increasing levels of economic well-being will create vast increase in demand for natural resources. As such, the CE will not only be an economic opportunity, but a necessary strategic paradigm for economic development that can foster sustainable economic development while decoupling it from resource consumption and negative environmental impacts.

This continental report is the final deliverable in a series of reports within this project, where the previous reports focused on the current and potential role of CE in eight African countries, spread over the continent. This continental report builds further on the insights from these country reports and looks at CE-related developments and opportunities at a higher level, taking account the international, continental and regional aspects as well. It describes ongoing trends, challenges and opportunities relating to the circular economy transition at the continental and regional level. In addition, it synthesises key CE-related developments found in Africa across various priority sectors providing examples of policies, circular business & products and initiatives. Furthermore, the report includes an exploratory analysis on the relationship between CE and trade, assesses the potential impacts of a broader CE transition in Africa in economic, social and environmental terms through macro-economic modelling complemented by a qualitative contextualisation of the findings. The information presented in this report builds on extensive desk research, enriched by the insights from interviews with stakeholders with a wide range of backgrounds, including local African organisations as well as European and multilateral organisations.

Circular Economy policies in Africa

In recent years, “Circular Economy” is mentioned explicitly more and more in national strategies and continental declarations. On the continental level, efforts are becoming more concrete: while in 2015, in the guiding vision “Africa 2063”, CE was only addressed indirectly through topics like climate change adaptation or sustainable development — the attention for CE was substantially increased with the launch of the African Circular Economy Alliance (ACEA) in 2017 and commitment to promote the CE at the continental level gained momentum during the 17th African Ministerial Conference on the Environment (AMCEN) in 2019. The highlight of this journey is the anticipated African Circular Economy Action Plan which is currently under development. Up to now, most of the CE-related advancements have occurred at the national level: **almost all African countries (52/54) have at least one CE-related policy in place**. This can be a CE roadmap, climate change or sustainability policies, product policies,

Extended Producers Responsibilities policies, waste management and recycling policies or fiscal policies. The **focus lays on product policies, such as bans on single-use plastics, and waste management and recycling policies, but their enforcement and implementation levels still vary significantly and are often insufficiently developed.** There are strong differences across African countries, both in the level of ongoing activities in the area of CE as well as in whether the private sector or the government is most active in promoting CE developments.

Circular economy potential from a sectoral perspective

In essence, the CE is a holistic concept that represents a model for the *entire* economy. As such the concept is relevant for each area of the economy. However, given the magnitude of the efforts accompanied by a structural change from the linear economic model to a circular one, it is a valuable exercise to assess which sectors to focus on when starting the transformation process. These sectors can be selected based on their general economic importance, the extent to which they affect resource or waste flows or the level of existing CE activities or a combination of these factors. Based on such an assessment, our study as well as similar research initiatives identified the following sectors as **priority sectors for the circular economy transition in Africa: Agri-food, construction, electronics & ICT products, plastics & packaging and the waste sector as a horizontal enabler of a CE shift.** In some African countries, the textiles sector can also be a priority sector for CE development, but since this is not universally so across the continent, this sector was not analysed in detail.

Interactions between Circular Economy and trade

As the CE changes the economic structure and interlinkages between economic sectors, a CE transition also affects international trade flows. The impact on trade flows can take place at multiple levels where the most important changes are related to:

- Trade in services;
- Trade in second-hand goods;
- Trade in goods for remanufacturing and refurbishment;
- Trade in waste and scrap;
- Trade in (secondary) raw materials.

When only the EU economy would undergo a CE transition, this could have minor negative impacts on trade with Africa (more significant impacts may occur in countries where exports of materials to the EU represent a relatively large share of the GDP), mostly due to reduced imports of manufactured products into the EU due to increased repairs and product lifetime as well as reduced imports of primary raw materials from Africa. However, **when both economies undergo a shift to a (more) circular economy, overall Africa-EU trade might decline slightly, but for Africa it would result in significant improvements in its trade balance.**

Impacts of a Circular Economy transition in Africa

A CE transition in Africa can have a wide range of impacts on economies, societies and the environment. In order to shed some light on the impact that a CE transition would have in Africa, we have undertaken a macro-economic modelling exercise to assess the potential impacts of the implementation of some first CE measures in a limited set of priority sectors to provide some preliminary insights of what the impacts of such a transition would look like. Given the limitations in relation to the quality, availability and level of detail of the economic data for most African countries, the quantitative modelling approach has been complemented with a generic sketch of the qualitative impacts that could be expected from a CE transition.

The modelling of the impacts of the CE transition on the African economy was carried out using the E3ME model, a global macro-econometric model developed and operated by Cambridge Econometrics. **The modelling results suggest** that the implementation of a first set of **circular measures in a limited set of priority sectors could lead to positive GDP and employment outcomes for the African economy.** By 2030, Africa's combined **GDP is projected to be around 2.2% higher in the CE scenario** than in a business-as-usual situation. **Total employment in 2030 is 2.7% higher** than in a business-as-usual projection, or approximately **11 M additional jobs**, which could reduce Africa's unemployment from 94 million by 12% to around 83 million. The modelling further suggests

that per unit of economic growth, CO₂ emissions would be lower in the circular economy scenario compared with the CO₂ emissions per unit of economic growth in the business as usual scenario. Absolute decoupling of economic growth and CO₂ emissions, however, will require a further decarbonisation of energy use and/or increased energy efficiency, alongside the circular economy transition.

From an economic point of view, a shift to a CE in Africa could have a **positive impact on the development of a larger, more competitive and resilient manufacturing sector**, as CE strategies can help businesses in this sector to better utilize the material resources available in waste streams, thereby reducing the dependence on imported materials. Another important economic aspect that the CE could bring to African economies is economic diversification, since many countries are still heavily reliant on the output of one or a few sectors, often related to resource extraction. Even though many countries already have the ambition to diversify their economies, the CE can give direction to such strivings. Lastly, it is important to acknowledge that even though a shift to a CE will provide new economic opportunities, it will also bring structural change to the economy and some sectors may see declining activity levels. Therefore, **negative impacts of the declining activity in such sectors need to be mitigated through policies aimed at re-skilling and retraining workers** from such sectors for newly introduced economic activities.

In addition to the creation of jobs, other **social impacts** such as better working conditions could also result from the implementation of CE strategies if implemented in a smart manner. In order to make a CE work, supply chains must become more transparent — schemes like extended producer responsibility (EPR) are a useful means to do so. This will play in favour of eradicating the grey zone of ethical conditions under which the product is produced. As circular businesses can bring more environment-friendly production and waste management processes, as well as a reduction in the production of waste, **the level of pollution in air and water can drastically be decreased**. This might directly benefit local communities by increasing their life quality and health. The CE transition requires diverse skill sets ranging from simple to highly specialised. This offers the opportunity to give many different occupations a place in the CE. Building up this capacity through trainings or educational programmes, where they are not existent yet, will positively impact the workers and their professional development.

Besides CO₂ emissions reductions, CE strategies have numerous benefits which are broadly related to **pollution reduction and enhanced biodiversity and ecosystems as result of reduced resource use and waste and regenerative practices. Reduced pollution** has health benefits for the local communities in terms of reduced air, water and soil pollution. The preservation and restoration of forest resources and less (plastic) waste being dumped in the environment, including rivers and the ocean, contribute to healthier ecosystems that in turn support biodiversity. CE practices in agriculture can lead to an extensive restoration of grasslands, soil integrity and biodiversity, and can also contribute to stabilise climatic conditions and restore a balanced hydrological cycle. As such, the circular economy in Africa can support most Sustainable Development Goals (SDGs) and notably on Zero Hunger (SDG 2), on Clean Water and Sanitation (SDG 6), on Life below Water (SDG 14) and on Life on Land (SDG 15).

For the CE transition to be successful, economic, social and environmental interests need to be considered holistically.

Circular Economy in existing EU-Africa cooperation

As both Africa and the EU are committed to developed strategies that support them in transitioning to a modern, resource-efficient and more competitive economy, **CE is becoming increasingly important in the cooperation between the two parties**. This collaboration is supported, among other things, by a constructive policy dialogue that takes place through a number of dialogue platforms such as the AU-EU Summit or the EUs CE Missions to African Countries. Furthermore, existing platforms such as the African Circular Economy Alliance, the African Ministerial Conference on the Environment, the World CE Forum provide promising entry points for expanding CE-related dialogue between the EU and Africa. Despite dedicated policy dialogues, there is a need to create dialogue platforms specifically dedicated to the CE transition and also to mainstream the circular economy concept to a broader range of continental policy dialogues and frameworks, not necessarily limited to areas such as

sustainability or the green economy. In this regard, the development of the African CE Action Plan as envisioned by the AU is promising to be an important step.

Complementing the aforementioned fruitful policy dialogues, **the EU and Africa are also progressively engaging in CE-related development cooperation and financing programmes.** To this regard, the current programming phase of the EU instrument for the Neighbourhood, Development and International Cooperation as well as ongoing trans-national cooperation projects such as Switch Africa Green, Switch Mediterranean or InTex, offer a major opportunity to facilitate future CE-related Africa-EU development cooperation but also for the economic recovery from COVID-19 of African partner countries. These activities are supported by joint AU-EU Research & Innovation partnerships as well. Key frameworks for CE-related R&I projects include the EU-Africa High Level Policy Dialogue on Science, Technology and Innovation (HLPD STI) and Horizon 2020/ Horizon Europe, both of which have identified the CE transition in Africa and the EU as a focus of their work. Although the HLPD STI framework has already led to a range of successful CE-related R&I partnerships e.g., on Nutrition Security, Sustainable Agriculture (FNSSA), Climate Change and Sustainable energy, the centrality of Circular Economy in their work and their visibility on the African Continent is still rather limited. **Therefore, the visibility of existing financing and research programmes need to be improved.**

As CE promises to create and develop new markets, it consequently draws attention to new business models, some of which are still unexplored in Africa. Through increased cooperation between EU and African companies, these new markets can be opened up leading to learning effects for the economies of both parties. Platforms such as the EU-Africa Business Forum already support this process. To date, however, most EU companies active in Africa have mainly operated in a very narrow CE niche and seem to focus on resource recovery (i.e., waste collection, reuse, recycling, and recovery) and many initiatives are still operating at a pilot scale. **As the transition to CE is still at an early stage in both the EU and Africa, this opens up a wealth of opportunities to explore other neglected business models that focus on circular design, optimal use, and/or circular support services.**

Recommendations to promote CE through Africa-EU cooperation

To ensure a successful take-off of the CE in Africa and the EU, changes are needed in many dimensions. Cooperation activities between the EU and African countries can play a positive role in this process of change. In this report we have focused on five areas where Africa-EU cooperation can play a role in CE development, namely: policy, trade, finance, research & innovation and business.

Policy cooperation can be enhanced through better coordinating and formalising existing dialogues on CE, further engaging with African-led CE initiatives (the ACEA and the AU expert Working Group notably) as well as establishing new structures that facilitates cooperation and progress-making. This would include the development of a CE-dedicated policy dialogue platform in the form of an EU-AU Task Force on CE which could bring together relevant African and EU stakeholders. It is also recommended to establish holistic CE-policies, roadmaps and action plans at the national level. Here, it is key that circular economy principles and policies are mainstreamed into the framework of economic, industrial/sectoral and financial policies rather than introduced as an environmental policy operating in a silo.

Moreover, a stronger knowledge transfer of political CE initiatives between Africa and the EU, could be beneficial. This should include EU lessons-learned, the provision of decision-making and monitoring tools as well as support for capacity building of national policy makers and public servants. Africa-EU cooperation in the area of CE would also benefit from stronger aligned agendas and initiative across the different DGs of the European Commission. Last but not least it is key to stress that **EU CE policies cannot be carelessly transferred to Africa, rather Africa needs a CE policy that is well-connected to its own policy context and priorities** and for this it can use effective elements from the EU CE policy toolbox. It is likely, that public-private partnerships will also play a large role in the development of effective CE development in Africa as the private sector, especially sector associations, can support the government in enforcement procedures.

Trade is an essential component of the relationship between Africa and the EU, leading to a strong interdependence. **Trade cooperation** needs to make sure a flourishing trade

relationship can be maintained, amidst substantial structural changes in the economies of European as well as African countries. Trade agreements should play in favour of the export diversification of the Least Developed Countries. Updating the scheme of Generalised Tariff Preferences (GSP) in a way that would allow CE-related goods and services to be included could be a good way forward in this respect. Effective implementation of existing economic partnership agreements (EPAs) needs to take place including the development of specific sustainability and circularity provisions. Continued dialogues at the international level are needed (e.g. with the WTO and Basel Convention) to improve definitions of (recyclable) waste and set standards for the quality of secondary materials, strengthen product standards to agree upon minimum criteria related to durability, repairability, recyclability etc. or mutual recognition of national criteria (which could also be done between the EU and African partner countries). Lastly, EU investments in increased custom checks within its own borders or support customs capacity within African countries can contribute to fight illegal waste shipments into Africa.

Development & financial cooperation would benefit from improving coordination of the activities of different CE-related EU-funded financial programs amongst each other as well as with the activities of international financial programmes (e.g., from the UN, World Bank or Regional development banks). Beyond this, the EU together with its Member States could also use its position to support capacity building amongst financial institutions, relevant ministries and the private sector as well as setting up new financial support frameworks, schemes or instruments to support the CE. Furthermore, a stronger cooperation with national Development Banks at Member State level (DBs) and between these and the International Development Banks (IDBs) could be beneficial in this context. Finally, it would be important to align financial models and instruments to the nature of CE business models and the scale of many CE businesses. Dedicated financial instruments for start-ups and MSMEs could be very helpful in this context, as these could help small companies with promising innovative solutions to scale up their activities. Also, CE-financing could become an explicit part of investment activities under the European External Investment Plan (EIP), helping the EU's investment targets in relation to the European Fund for Sustainable Development (EFSD) while accelerating the transition towards a CE both in Africa and the EU. Furthermore, it would be helpful to set up platforms and events where start-ups and small businesses can present their circular business models and show their results to financial institutions, so that the latter can be convinced that some of these business models have a solid business case and should hence be considered bankable.

Research cooperation can be improved through knowledge transfer and capacity building. In this regard, not only should existing research cooperation be broadened to include the topic of CE, but new partnerships between European and African universities and higher education institutes should be established as well. In addition, partnerships between research institutions & the private sector should be encouraged and international exchange programs with a particular focus on CE should be arranged. Lastly, it is important that CE-related knowledge present in academic and other knowledge institutions is transferred to the private sector and translated into concepts that can be practically implemented by businesses.

Business cooperation can potentially provide CE development in Africa a large boost, but currently there are many barriers for such cooperation to occur successfully. First of all, many European and other international companies are still hesitant to invest in many African countries due to a lack of political and economic stability, financial risks, poor governance, a lack of adequate infrastructure and several other factors. As such, improving the overall business and investment climate would also positively affect business activities in CE development. A challenge for the European Commission is that the promotion of private sector activities largely falls outside its mandate and are still dominated by fragmented, uncoordinated activities of individual Member States, not seldomly with conflicting interests. Therefore, without an increased willingness from EU Member States to harmonise private sector development activities, EU-led business cooperation activities are likely to remain challenging.

Still, private sector collaboration activities in the area of CE can be stimulated through events that provide networking, matchmaking and dialogue platforms; and the development and advertisement of labels to encourage local production of goods. Specifically, relevant European Commission services (including notably DG INTPA, TRADE and GROW), through the EU delegations, could play an important role in promoting CE-activities with high business

potential in Africa. In this respect, it is relevant to note that many CE-related initiatives undertaken at the national level are related to the activities of SMEs and start-ups, which often lack the financial capacity to upscale their activities. Next to this, it is essential that international corporations weigh into the developments and work together with the governments to discuss how they can contribute to more circular economies in Africa.

1 Introduction

1.1 This report

This report is one of the deliverables of the study ‘Circular Economy in the Africa-EU Cooperation’ conducted for the DG Environment of the European Commission. The study has been a 1.5-year research project on the role of circular economy in Africa and the role that EU-Africa cooperation is playing in the promotion of a circular economy transition. The study also addresses how this can be improved towards the future. The first part of this research project involved a deep dive into the circular economy related trends and opportunities in eight case study countries, which resulted in the publication of eight country reports.¹ The second part of the study, resulting on this report takes a more high-level perspective and describe the trends, challenges and opportunities relating to the circular economy transition at the continental and regional level. It also highlights key circular economy related developments in Africa.

When this project was envisioned, the aim was to bring more clarity on how the EU could increase its impact on circular economy development in its cooperation activities with Africa for instance through the EU delegations and through its trade relations. Since the launching of the call for tenders back in 2018, is the circular economy has only become more prominent, even more so with the EU Green Deal, which also put additional emphasis on increasing international cooperation, especially with Africa, to further ‘green economy’ development. The latter is also reflected in the EU External Investment Plan (2016), which aims to increase investments in the EU’s neighbouring regions, including eastern Europe, the MENA region and sub-Saharan Africa.

This study contributes to the implementation of the new Circular Economy Action Plan (CEAP) which among others states that the Commission should build a stronger partnership with Africa to maximise the benefits of the green transition and the circular economy.² In addition the study also supports the CEAP aim of ‘leading efforts at global level’ in issues such as mainstreaming circular economy objectives in free trade agreements, in other bilateral, regional and multilateral processes and agreements, and in EU external policy funding instruments. This report is also complementary to the staff working document (SWD (2020)100) accompanying the CEAP.³

1.2 Scope of the circular economy activities

Circular Economy (CE) in this report is understood as an economic system which ultimately produces neither waste nor pollution by circulating materials at a high quality within the production system and, if possible, feeding them back into the biosphere to restore natural capital at the end of life. As such, the circular economy covers both economic aspects (e.g., job creation, GDP growth) as well as environmental aspects (focusing on materials and resources). In addition, it takes a full lifecycle perspective, including raw material extraction and processing, design & manufacturing, use & consumption, as well as end-of-use management. Although we acknowledge that the transition to a zero-emission energy system is an integral part of the circular economy concept, this study addresses only material resources and not renewable energy deployment.

¹ For Egypt, Morocco, Senegal, Nigeria, Ghana, Rwanda, Kenya and South Africa which can be found at the Trinomics website: http://trinomics.eu/project/circular_economy_in-africa-eu_cooperation/

² EC (2020) [A new Circular Economy Action Plan for a Cleaner and More Competitive Europe](#)

³ [European Commission \(2020\) Leading the way to a global circular economy: State of Play and Outlook SWD \(2020\) 100, 11 March 2020](#)

1.3 Circular economy in Africa's context

1.3.1 General developments in Africa

In the last few decades, Africa has seen many positive developments. Africa has been the region with the largest increases in the Human Development Index, with especially the countries with low initial HDIs showing large improvements. The mortality rate of young children (<5 years) declined with 58% between 1990 and 2017.⁴ Life expectancy also grew strongly, where life expectancy was 50.5 years in 2000, this increased to 61.3 years in 2018.⁵ In the period 2000-2019, the continent's economy grew by 117%⁶, which is equivalent to an average annual growth rate of 4.2% compared to an average global growth rate of 2.8%.⁷ Despite all of these positive developments, Africa also faces numerous challenges.

Africa is the world's fastest growing continent in terms of population, and even though most African countries have shown solid economic growth figures during the last decade, growth is often not high enough to substantially reduce poverty levels due to the strong population growth. This development is aggravated by growing income inequality in several parts of the continent.⁸ As a consequence, Africa is the only continent where poverty levels have not declined over the last decade. Poverty is also a large problem among the youth, with 104 million people between 14 and 25 living below the international poverty line in 2019, of which 80 million live in Africa.⁹ However, in March 2019, an important milestone was reached - the tipping point from a growing number of Africans living below the poverty line to a declining number. A continuation of the trend would mean that by 2030 the share of people living below the poverty line would have declined from 33.5% in 2019 to 24%.¹⁰ Nigeria and the Democratic Republic of Congo are important players when it comes to realising the continuation of this declining trend as these two countries account for a quarter of all the Africans living below the poverty line.

Unfortunately, COVID-19 has brought change in the course of events. As consequence of the economic fallout of the global pandemic, growth in Sub-Saharan Africa may have fall to -3.3 percent in 2020, pushing the region into its first recession in 25 years. The pandemic could also drive up to 40 million people into extreme poverty in Africa in 2020, erasing at least five years of progress in fighting poverty.¹¹ In this context, the extent to which the trends that emerged in the last few years can be resumed have become uncertain, as this will depend strongly on how fast the virus will be in check and how long it will take for African economies and the global economy to recover.

Overall, the manufacturing sector is not very well-developed in a large number of African countries. And the performance of the manufacturing sector is also strongly related to the economic performance of a country. Overall, five countries, namely South Africa, Nigeria, Morocco, Egypt and Algeria accounted for only one third of the African population in 2018, but for two thirds of the total value added created in the continent. Moreover, these five countries together represent 74% of all the value added from manufacturing generated in the continent.

⁴ UNICEF (2019) [Children in Africa: Key statistics on child survival and population](#).

⁵ World Bank (2020) [Life expectancy at birth, total \(years\) - Sub-Saharan Africa](#).

⁶ Based on all African countries, excl. Djibouti, Eritrea, Somalia and South Sudan - Including correction for inflation.

⁷ World Bank (2020) World Development Indicators - GDP (Constant 2010 \$US)

⁸ UNDP (2017) Income inequality trends in sub-Saharan Africa - divergence, determinants, and consequences.

⁹ Brookings Institute (2019) More than 100 million young adults are still living in extreme poverty.

¹⁰ Brookings Institute (2019) Poverty in Africa is now falling—but not fast enough.

¹¹ Zeufack, Albert G. et al. (2020) [Africa's Pulse, No. 22, October 2020: An Analysis of Issues Shaping Africa's Economic Future](#). World Bank, Washington, DC.

Despite the fact that some African countries are major producers of natural resources and have substantial domestic extraction volumes, domestic resource consumption remains rather low in Africa, mostly due to lower overall consumption levels due to relatively low average incomes compared to the rest of the world. The resource consumption of the average African amounted to 4.8 tons per year in 2017, compared to a world average of 12.2 tons and a European¹² consuming 13.8 tons per year.¹³ However, due to urbanisation and changing consumption habits waste generation levels are converging with Europe. By 2025, the average African will generate around 1kg of waste a day (although strong variation exists across countries), compared to 1.33 kg of waste per capita per day for the average inhabitant of the EU in 2017. When looking at the contribution to climate change, we see that Africa accounts for only 4% of the global greenhouse gas emissions, while being a home to 17% of the world's population.

1.3.2 *The circular economy: a necessity and an opportunity*

The circular economy is already an important element of many African Economies but mainstreaming its principles also into economic growth and development strategies will be an important requirement to tap into the full potential that the circular economy can bring to the continent. Many African businesses are already implementing circular economy activities in their daily businesses, without being aware of the circular economy concept – as Ndidi Ndoli-Edozien chair of the Afrikairos, Growing Businesses Group put it during this year's edition of the World CE Forum: “Circular economy is intuitively African”. However, an upscaling of successful initiatives is needed as well as a change in mind set and business models to transform the private sector. For Africa, the Circular Economy is both a necessity and an opportunity.

“Circular Economy is intuitively African”

Dr. Ndidi Ndoli-Edozien, chair of the Afrikairos Growing Businesses Group

The role of CE in tackling major challenges in Africa

Even though many African countries have made a lot of progress when it comes to economic development, and progress towards the achievement of several sustainable development goals, the continent still faces several significant challenges and problems. These challenges include strong population growth combined with very strong urbanisation rates, an impact of climate change on African economies, alarming rates of habitat loss and associated biodiversity loss due to agricultural expansion and deforestation,¹⁴ conflicts and political instability notably related to resource extraction, growing environmental pollution and health problems due to waste accumulation and most recently the strong hit of the COVID-19 pandemic.

Africa's population is the fastest **growing population** of all continents. When this growth rate persists, Africa will have a population of 2.5 bn people in 2050 (compared to 1.3 bn in 2020), accounting for a quarter of the world's population.¹⁵ This strong population growth makes it challenging to reduce poverty levels in the continent and provide everyone with a job. Furthermore, it puts more strain on the continent's resources. As around 80% of the continent is still reliant on firewood for cooking and heating, the growing population notably puts a strain on Africa's forest resources.¹⁶

¹² UN M49 classification, so also including many non-EU countries.

¹³ Global Material Flow Database - SDG indicator 8.4.2.

¹⁴ UNEP (2020) [The state of the World's forests - Forests, biodiversity and people.](#)

¹⁵ UN (2020) [World Population prospects 2019.](#)

¹⁶ FAO (2017) [Incentivizing sustainable wood energy in sub-Saharan Africa - a way forward for policymakers.](#)

Next to this, Africa faces high-speed **urbanisation and city growth**, as cities are perceived to offer higher employment chances. In 2015, around 40% of Africa's population lived in cities and this is expected to grow to 56% in 2050.¹⁷ This urban growth often makes it hard for cities to provide sufficient access to decent housing as well as access to water, energy and waste management services. In many African cities, illegal waste dumps represent a growing problem as the official landfills have often reached or surpassed their maximum capacity.

Agriculture is still a key source of income and employment in many African economies, accounting on average for 14.4% of the GDP in Sub-Saharan Africa (2018), whereas the global average of this share is only 4%.¹⁸ Even though agricultural yields have grown substantially in Africa over the last decades, there is still a considerable yield gap compared to other regions in the world. Due to the combination of this **limited agricultural productivity** and the growing population numbers, the area of agricultural land in Africa expanded with 14% (1.41 M km²) in Africa between 2000 and 2016 whereas at the global level the agricultural area increased by only 1.1%.¹⁹ Often **agricultural expansion** leads to loss of nature areas, such as forests, shrublands or savannahs, resulting in habitat loss and negative impacts on biodiversity. At the same time, agriculture in Africa is already being hit by the impacts of climate change in the form of droughts, other extreme weather events as well as insect plagues,²⁰ which makes it more challenging to close the yield gap. However, application of circular economy principles in Africa's agri-food sector, could help to increase resilience, improve farmer incomes and reduce environmental pressures. Investments in improved handling, storage, cooling and distribution of harvested crops could significantly reduce food losses and support of local production of organic fertilizers can help close local nutrient cycles and increase the affordability of fertilizer products.²¹

In Africa, **resource extraction** often causes **human conflicts** and poses a threat to nature areas. Several African countries are endowed with substantial amounts of natural resources, including minerals and fossil fuels. Although the extraction of these resources generates income, this often does not translate to positive impacts to the concerned economies overall, a phenomenon known as **the 'resource curse'**. A well-known example is the Democratic Republic of the Congo, where cobalt mining activities are an ongoing source of conflict, but also of heavy environmental pollution and health risks.²² The shift to more circularity in the economies of African trade partners might reduce the demand for virgin raw materials, which could be an additional driver to diversify economic activities from resource extraction to other activities. At the same time, demand for secondary materials may increase, creating new economic opportunities.

Many countries in Africa were on a rather stable path of economic development and economic outlooks also looked rather rosy, but then the **COVID-19 pandemic** hit the world also seriously impacting the lives of many Africans. The crisis has led to an economic recession and soaring unemployment, reduced access to education and reduced incomes for already poor households resulting in reduced access to food.²³ Already in April this year, African Ministers concluded at a meeting of the Economic Commission for Africa that the continent needs \$US 100 bn in financial support from the international community to recover

¹⁷ Teye, J. (2012) [Urbanisation and Migration in Africa](#)

¹⁸ World Bank (2020) World Development Indicators - Agriculture, value added (% of GDP)

¹⁹ World Bank (2020) World Development Indicators -

²⁰ UNFCCC (2020) [Climate Change Is an Increasing Threat to Africa](#); Salih *et al.* (2020) Climate change and locust outbreak in East Africa. *Nature Climate Change* 10: 584-585(2020)

²¹ <https://safiorganics.co.ke/>

²² De Putter (2020) "Cobalt means conflict" - Congolese cobalt, a critical element in lithium-ion batteries

²³ World Bank (2020) [Socioeconomic impacts of COVID-19 in four African countries: watch the event recording](#)

from the COVID-19 crisis.²⁴ The pandemic has clearly exposed some supply chain vulnerabilities, import dependency risks and the dependence on resource exports for a large part of the economy.

The CE represents a major opportunity for Africa

Circular economy approaches show in fact strong **synergies with other priorities in the economic policies** of many African countries including the promotion of domestic industries, economic diversification, job creation and reducing import dependencies in many value chains. The circular economy could be used as a paradigm that connects these economic priorities in a holistic and sustainable manner. Combining the development of strong manufacturing sectors with CE approaches can enable African businesses to engage in activities that generate higher value added and jobs. This especially applies to the handling of waste streams like E-waste, where refurbishment and remanufacturing activities could potentially generate much more value than mere material recovery approaches.

The CE does not only represent an economic opportunity, but also a **social opportunity**. CE approaches can improve livelihoods by reducing costs of certain goods and services. For instance, circular construction practices could contribute to making housing more affordable and circular approaches in agriculture could enhance productivity and income requiring limited investments. Even more importantly, unemployment is still a daunting problem in Africa and this problem will only be aggravated by the strong population growth. Several studies have shown that the circular economy tends to replace resource, capital and emission intensive processes by less resource-intensive but more labour-intensive processes leading to positive effects in the labour market.²⁵ To reap these potential benefits it will be key to train the workforce with the required skills (including technical skills and transferrable skills) that are needed in circular value chains.

The circular economy also represents a major **environmental opportunity**. Currently, Africa faces many environmental problems including alarming deforestation rates, environmental pollution and soil degradation. The circular economy presents a paradigm for combining economic growth with protection and restoration of natural capital to ensure that Africa's wealth of natural resources is used in a sustainable way, ensuring the continued benefits of its riches for generations to come.

In fact, even the challenges aforementioned in the previous section, could represent opportunities for the CE. If we take the rapid urbanisation trend for instance, this holds the potential to offer a great opportunity to embed circularity principles in urban planning and management, to attract / grow circular economy businesses, and to change the behaviour and mindsets of consumers.

As Joy Kategekwa of the UN Development Program put it, "*the COVID pandemic should be seen as an opportunity rather than a setback*".²⁶ Green recovery policies and investments that build on circular economy principles, can help to weaken the aforementioned dependencies, build stronger local value chains and create new economic opportunities. This is nicely illustrated by the example of Safi Organics, a producer of an organic fertilizer product from organic waste (biochar). Their sales went up tremendously, due to supply disruptions relating to the imports of mineral fertilizers.

²⁴ UNDP (2020) [Massive bill coming Africa's way as the continent finally begins to speak with one voice](#)

²⁵ IISD, SITRA (2020) [Effects of the Circular Economy on Jobs](#); Trinomics (2018) [The effect of the circular economy on the labour market in Europe](#)

²⁶ World Circular Economy Forum (2020) Session on fostering inclusivity with circularity in Africa's post-Covid-19 recovery

In conclusion, CE can provide an opportunity to reconcile African economic, social and environmental aspirations. As stated by Ellen McArthur²⁷, this requires a paradigm shift towards “system thinking” and away from silo thinking, in order to acknowledge that these three elements are interconnected and to find the right balance between them for the system to survive.

1.3.3 *Interdependence EU and Africa for the Circular Economy transition on both continents*

The fates of economic prosperity and security of Africa and Europe are intricately linked. The continents are important trade partners and there is a mutual dependence on each other’s goods and resources. This also means, however, that structural economic changes in one continent also affect the economy and people in the other. As such, it is important that in these times of major economic reforms, due to climate change policies and more recently the transition to a circular economy, economic cooperation and policy dialogues are strengthened so that synergies are leveraged, and negative economic impacts of policy changes are prevented or mitigated as much as possible. Therefore, it is timely that the EU Green Deal addressed the need for increased international cooperation with a focus on Africa and other neighbouring regions. It will be key, however that the intensification of Africa-EU policy dialogues will address the mutual needs and policy priorities in both continents.

1.4 Methodology

The primary and second-hand research carried out for eight African countries²⁸ and presented in eight bespoke country reports has been the basis of this report. A meta-analysis of the findings of these country reports in the areas of manufacturing, waste management and construction sector as well as trade has fed into this continental report. Chapters 2 and 4 have been complemented with further desk research, including the analysis of a wide variety of reports from international institutions and international datasets (e.g., on trade).

Interviews have been also carried out with relevant stakeholders in countries not covered by the eight country reports already delivered. Interviewees included among others African Circular Economy Network (ACEN) country representatives, the EU delegation in Zambia, the African Development Bank (AfDB), UNEP, DG INTPA, DG TRADE, the OECD Joint Working Party on Trade and Environment and many more. The full list of interviewees can be found in Annex A. The outputs of these interviews have fed into Chapter 2, 3, 5 and 6.

This report also includes the findings of two modelling exercises, where the first investigated the impacts of a CE transition within the EU on the EU-Africa trade relations and on the African economy (section 3.3). The second, more extensive analysis looked into the impacts of a broader CE transition within Africa (section 4.1). The scenario used in this exercise builds upon the data collection and assumptions formulated in the modelling activities for the country reports. The modelling of CE impacts and benefits featured in this report have been carried out using Cambridge Econometrics global Econometric model E3Me. A short explanation of the modelling approach and assumptions is presented in the modelling related sections of this report (3.3 and 4.1) and a more elaborate description of the E3Me model, the scenarios and data sources used can be found in Annex C.

²⁷ Ellen Macarthur Foundation website. [Systems and the Circular Economy](#)

²⁸ Egypt, South Africa, Nigeria, Rwanda, Senegal, Morocco, Kenya and Ghana

1.5 Reading guide

This report consists of four main parts, where the first part (chapter 2) sets the scene by describing the current trends related to circular economy development in Africa, from a policy perspective as well as a private sector perspective. Additionally, this part contains a section that zooms in on the trade relations between the EU and Africa, and how this is related to the circular economy. Chapter 3 of this report focuses on the benefits that a broader circular economy transition could bring to Africa as a whole. These benefits have been assessed through a macro-economic modelling exercise, using the global econometric model E3ME, where the implementation of a limited set of circular economy measures was analysed in five focus sectors, namely agriculture, plastics, electronics, construction and waste management. Chapter 4 analyses the extent to which circular economy related activities play a role in existing EU-Africa cooperation activities, at both the multilateral and the bilateral levels, covering policy dialogues, development cooperation activities, trade agreements, research cooperation as well as private sector cooperation. The report concludes with a set of recommendations on how the circular economy transition can be promoted more effectively in EU-Africa cooperation activities in the future.

2 Status of the circular economy in Africa

2.1 Circular economy policies and legislation

As yet, circular economy (CE) has rarely been explicitly considered in African policymaking. This does not imply that circularity per se has not been embedded in traditional economic and social practices – on the contrary. It is rather that the terminology “Circular Economy” has not yet gained major attention as a concept and objective in African policymaking. Therefore, it is important to recognise existing structures and practices on which a CE transition could be built. This includes, for instance, waste management policies and climate change strategies. However, in recent years, African policymaking has been giving growing attention to CE through national strategies and continental declarations.

On each level (including the national level), a few initiatives emerge pushing the topic forward. Their focus and extent vary and depend on aspects such as power dynamics, geographic and economic conditions, international demand as well as the degree of political will, that together create opportunities but also challenges. For instance, due to their location and number of ports, both West and East Africa are accessible (West Africa more than East Africa) for imports by container ships. West Africa faces more imports of e-waste and vehicles whereas East Africa is confronted with higher imports of second-hand textiles. Therefore, it is important to set differentiated policy priorities amongst geographical (horizontal) and structural (vertical) levels while pursuing the same superior goal: advancing the African economy towards a circular one. To overcome major constraints or barriers on this journey, including financial and other incentives, it is crucial to consider factors that shape an enabling environment for CE (Box 1).

CE-specific developments on the **continental level** are limited, but slowly emerging. The guiding vision “Africa 2063”²⁹, launched in 2015, addresses climate change mitigation and adaptation, sustainable development and sustainable use of resources, but does not explicitly mention the term Circular Economy. Also, the initiative of the African Union (AU) linking its agenda to the UN Sustainable Development Goals (SDGs), does not explicitly refer to CE as such. Indirectly, it was addressed by only highlighting the importance of sustainable natural resource management, sustainable and inclusive economic growth³⁰, as well as waste recycling in urban areas, which nevertheless represent important “hooks” for circularity principles.³¹ However, more concrete initiatives have emerged in the last two years: in 2017, a ministerial-level forum, the **African Circular Economy Alliance (ACEA)** was launched by Rwanda, South Africa and Nigeria. Early 2019, at the AU Summit, the African Union Member States’ (AU MS) First Ladies launched the campaign to ban single-use plastic in Africa. Then, in October 2019, at the African Union 3rd Specialized Technical Committee on Agriculture, Rural Development and Water (ARDWE), AU MS ministers adopted a decision requesting the AU Commission to broaden the scope of the collaborative work on facilitating the ban of single-use plastic to embrace Circular Economy due to its environmental and economic benefits. The decision was then complemented by the 17th Session of the **African Ministerial Conference on Environment (AMCEN)**, which took place in November 2019, where environment Ministers adopted the Durban Declaration³² for environmental sustainability that includes CE ambitions for the whole continent. AU MS Ministers requested the AU Commission to define the circular economy concept for Africa and put in place mechanisms for its adoption, in collaboration with UNEP,

²⁹ African Union (2015) [Agenda 2063 The Africa we want. - Overview](#)

³⁰ African Union (2015) [Africa 2063 The Africa we want. - SDGs](#)

³¹ African Union (2015) [Africa 2063 The Africa we want. - Key transformational outcomes](#)

³² AMCEN (2019) [Report of ministerial segment](#)

Regional Economic Communities and Partners. In the declaration, African ministers agreed to “raise the political visibility and awareness of the circular economy in Africa through the development of policies, regulatory frameworks and institutional arrangements” and committed to “replicating, scaling up and using circular economy approaches as part of our region’s transformation efforts as contained in Agenda 2063 of the African Union”.

A last important development is the first **African Union Expert Working Group meeting on CE** organised by the African Union Commission on 23 October 2020, where partners and stakeholders were invited to join the working group and support the development of an African Circular Economy Action Plan. This is the follow-up of the mandate the AUC received from the AU STC ARDWE (Specialised Technical Committee on Agriculture, Rural Development, Water and Environment - AU Ministerial Meeting) and AMCEN to develop an African Circular Economy Action Plan (CEAP), to be adopted at the next AU STC ARDWE term in 2021.³³

On the continental level, CE-specific policy advancements are driven by joint initiatives of the AU and the African Development Bank (AfDB) as well as the African Circular Economy Alliance (ACEA) concentrating on the “Coalition of the Willing”. Here, progress is restricted to the conviction and motivation of a few countries, their bilateral communication and concrete steps to move the CE forward. This rather liberal approach is unlikely to unlock the full CE potential of the continent.³⁴ Therefore, the anticipated African CEAP 2021 is hoped to provide guidance to further develop the Circular Economy in Africa from the top-down, guiding regional and national policymaking with systemic and more ambitious objectives and finally, supporting the development of national CEAPs. Ideally, its implementation would be realised in collaboration with bottom-up initiatives such as the African Circular Economy Network (ACEN) that promotes CE principles on the ground.³⁵ Overall, the present and planned initiatives show political commitment towards CE which were manifested again at the most recent meeting of the African Ministerial Conference on the Environment on 4 December 2020, where the ministers considered a new African Green Stimulus Programme that clearly mentions CE as one of the priorities for Africa’s post-COVID recovery.

On the **regional level**, most of the efforts related to CE refer to trade and the harmonisation of intra-African policies and standards. Amongst the five regions in Africa, the East African Community (EAC), composed of Kenya, Tanzania, Uganda, Rwanda, Burundi and South Sudan, took the strongest initiative in developing laws to support CE. In 2015, the EAC announced that from 2019 onwards imported second-hand clothes and shoes will be banned from their markets as their low prices would hinder local and regional development. However, after complaints from international exporters (especially the U.S.A.) arguing this decision would harm international trade agreements, this strict approach has been loosened and policymaker decided for an only indirect ban. This “compromise” includes increasing tariffs, which are intended to disincentivise imports of second-hand clothing, while incentivising locally produced products and industries. For instance, in 2016, Uganda increased its environment levy on used clothes from 15% to 20%. Two years later, Rwanda imposed a tax on imported used clothes at \$ 4 per kg—it will be \$ 5 per kg (two years ago the tax was \$ 0.2 per kg) and Kenya introduced an import rate of \$ 5 or 35% per unit, whichever is higher³⁶. However, these measures are only the beginning as they do not directly

³³ According to information received from Gaetan Ducroux on the 3/11/2020.

³⁴ According to the interview with stakeholders from the AfDB, Dalberg, ACEA on the 19/10/20.

³⁵ According to the interview with stakeholders from the AfDB, Dalberg, ACEA on the 19/10/20.

³⁶ Africa Renewal (2017) [Protectionist ban on imported clothing](#)

drive the CE transition, they might even hinder it unless local industries that are specifically utilising second-hand materials and/or pursue a CE business model are not incentivised at the same time³⁷. Thus, further measures are needed that go beyond trade policies and address local businesses.

Another value chain tackled by the EAC is plastic. In 2017, the regional Polythene Materials Control Bill has been announced and was adopted in 2020. It sets out a series of restrictions and controls upon the continued introduction of polythene material into the EAC. These restrictions address manufacturers, importers, vendors and other users of polythene and aim at removing polythene usage from competition within and between the EAC members. However, the adoption in 2020 advanced slowly as a few EAC members hesitated due to absence of clear data on its environmental and commercial success.³⁸

A more distant example related to CE comes from the Economic Community of West African States (ECOWAS). In 2020, it adopted a standard that promotes cleaner fuels and vehicles in West Africa. Besides a quality standard of the fuels in use, from January 2021 onwards, all imported vehicles must comply with a minimum emission standard of EURO 4/IV and must not exceed an age of 10 years (with a recommended maximum age of 5 years for light commercial cars). This way, the efficiency of the vehicle fleet is aimed to be increased while reducing air pollution. This initiative may also positively affect the number of unusable vehicles and vehicle parts ending up on landfills and open incineration sites.³⁹

The other African Regional Economic Communities (RECs) hold policy dialogues tackling the circular economy, but they are not yet as advanced as the EAC in developing policies that support regional circular economies.

A supportive regional initiative, worth mentioning at this point, is a series of regional meetings run under the SWITCH Africa Green programme that brought forward a collaboration strategy for waste management. Such meetings do not immediately and automatically lead to new laws but enhance political dialogue and pave the ground for innovative policy amendments and novelties related to the Circular Economy in the long run. Instead of focussing on one geographical region, this initiative operates cross-regionally. Within a regional sector meeting, taking place in June 2019, in Accra, Ghana, it focalised the topic around Integrated Waste Management. Micro, small and medium enterprises (MSMEs) and government officials from countries including, amongst others, Burkina Faso, Ghana, Ethiopia, Kenya, Mauritius, South Africa, Uganda, Nigeria and China were brought together. Regional Economic communities such as ECOWAS and SADC, European Union, Financial Institutions, UN agencies also participated as well as experts and stakeholders in the waste sector⁴⁰. Another, more recent, regional meeting was held in Uganda, in February 2020, with the intention to enhance regional efforts to scale up circular and green businesses while inspiring policymaking and implementation. Concluding recommendations for policy support included promoting the review and updating of existing policies and legislative frameworks to incorporate green economy and circular economy principles for the development of sector guidelines on CE⁴¹.

³⁷ According to Johanna Tilkanen, Chatham House on the 18/01/21.

³⁸ Cocker, J., D. (2020) [Is the East African Community an Example for Plastic Pollution Strategy?](#)

³⁹ Afrik21 (2020) [West Africa: ECOWAS countries sign up for cleaner vehicles](#)

⁴⁰ Switch Africa Green (2019) [Switch Africa Green Regional Meeting, Ghana 2019](#)

⁴¹ Switch Africa Green (2020) [Switch Africa Green Regional Meeting, Uganda 2020](#)

Most of the political action and advancements related to CE occur on the **country level**. They run under the umbrella of the green economy, waste management, climate change and sustainable development. Hence, present national political initiatives either cover overlapping areas supporting the Circular Economy or they do integrate CE principles. Inspired by a CE policy mapping⁴², recently published by Chatham House, respective policy categories are listed in Table 2-1 indicating which countries have adopted which and how many of the policy types.

The five policy categories are structured as follows:

- **CE action plans & roadmaps** contain legislative and non-legislative measures that consider the entire life cycle of products to advance CE;
- **CE-related policies** include any national circular economy policies already in place as well as national green growth or sustainable development strategies which integrate circular economy principles;
- **Product policies** define any policies that support circular practices relating to the design, manufacture, distribution or import of specific products and materials (mostly plastic bans or levies);
- **Extended producer responsibility (EPR)** policies relate to policies that place the responsibility for the environmental impacts of products throughout the product life cycle to producers and is often applied to the collection, processing and re-utilisation of waste;
- **Waste management and recycling policies** cover policies that encourage circular practices relating to the management of waste covering generation, segregation, transfer, sorting, treatment, recovery and disposal;
- **Fiscal policies** include government tax and spending policies that incentivise circular practices.

The table shows that almost all African countries (52/54) have at least one of the five policy types in place while 50 out of 54 have some level of waste policy in place. However, their enforcement and implementation vary significantly. It also clearly displays the focus of African policies in relation to the Circular Economy which is on product policies and waste management, and recycling policies. In fact, a growing number of countries is in the process of integrating CE in waste management as their National Determined Contribution for climate action. This trend will be an important element during the next World Circular Economy Forum (WCEF+Climate).⁴³ For the product policies, it should be noted that they primarily include plastic bans and not product design policies as it would be desirable from the CE perspective.

⁴² Chatham House (2020) [CE Policy Mapping](#)

⁴³ Government of the Netherlands (2020) [Aiming at a circular economy by 2050, a necessity for carbon neutrality](#)

Table 2-1 Overview of categorisation of policies integrating or supporting the Circular Economy

National policies	Countries
CE Roadmaps	(Senegal and Morocco) ⁴⁴
CE-related policies	Tunisia, Egypt, Algeria, Gabon, Kenya, Rwanda, Madagascar, Morocco, Senegal, Nigeria, Ghana, South Africa
Product policies	Benin, Burkina Faso, Burundi, Cameroon, Cap Verde, Ivory Coast, Democratic Republic of Congo, Egypt, Eritrea, Ethiopia, Gabon, Guinea-Bissau, Kenya, Madagascar, Malawi, Mali, Mauritania, Mauritius (2), Morocco, Mozambique, Namibia, Niger, Republic of Congo, Rwanda, Senegal, Seychelles, Somalia, Sudan, Tanzania, Togo (2), Tunisia (4), Uganda, Zambia, Zimbabwe (2)
Extended producer responsibility policies	Cap Verde, Ivory Coast, Gambia, Ghana, Madagascar, Mali, Mauritius, Mozambique, Nigeria (9), Rwanda, Senegal, Uganda, Zambia, Zimbabwe, South Africa
Waste management and recycling policies	Algeria (3), Angola (2), Benin (3), Botswana (3), Burkina Faso (3), Burundi, Cameroon (6), Cap Verde (2), Central Africa Republic, Chad, Comoros, Ivory Coast, Democratic Republic of Congo, Djibouti (2), Egypt (5), Eswatini, Ethiopia, Gabon, Gambia (2), Ghana (4), Guinea, Kenya (2), Liberia, Libya, Madagascar (3), Malawi, Mali (2), Mauritania, Mauritius (3), Morocco, Mozambique (3), Namibia (4), Nicaragua (2), Niger (3), Nigeria (2), Republic of Congo, Rwanda (3), Senegal (2), Seychelles, Sierra Leone, Somalia, South Africa (5), Sudan, Tanzania (4), Togo (3), Tunisia (3), Uganda (4), Zambia (3)
Fiscal policies	Algeria, Benin, Botswana, Burkina Faso, Cap Verde, Ghana, Guinea, Lesotho, Mauritius (2), Namibia, Seychelles, South Africa

Source: own table (inspired by [Chatham House \(2020\)](#))⁴⁵

From the eight case study countries, all have a Sustainable Development or Green Economy strategy. The National Sustainable Development Strategy of Morocco even incorporates the Circular Economy under Axe 11 “Promote integrated waste management for implementing a circular economy”. Beyond the case study countries, also Tunisia, Algeria, Gabon and Madagascar have integrated CE principles in their sustainable development or green growth strategies. However, present policies are not going further – continent-wide, no country has a **CE Action Plan or Roadmap** in place yet; only two countries (Senegal and Morocco) are in the process of developing such:

- In Senegal, the Directorate of Green Financing and Partnerships (DFVP) of the Ministry of the Environment and Sustainable Development (MEDD) has carried out a study on the concept of the circular economy and its stakes for Senegal. This study has given rise to a roadmap of the Circular Economy in Senegal (FRECS)⁴⁶;
- In Morocco, the Ministry (MICEVN) is currently working on a roadmap for CE in the framework of a green economy plan.⁴⁷

⁴⁴ Under revision and development.

⁴⁵ Complemented with a few countries based on the finding of the country reports.

⁴⁶ Directorate of Environment and Classified Establishments (DEEC), Financing and Partnerships Division (DFVP), e-mail communication and submitted answers. 8 June 2020 Mr. Al Hassane DIOP, Director of Green Financing and Partnerships (DFVP) of the Ministry of the Environment and Sustainable Development (MEDD), Mr Cheikh FOFANA, Deputy Director of Environment and Classified Establishments (DEEC) of the Ministry of Environment and Sustainable Development (MEDD).

⁴⁷ According to Sandrine Beauchamp, EU Delegation Morocco, email from 22/10/20 and AMME (2020) [Participation de L'AMEE au webinaire: « La valorisation des déchets - Enjeux et perspectives d'une économie circulaire, verte et inclusive](#)

In the following, a few outstanding policies supporting the Circular Economy will be introduced based on the case study countries and continental research investigations.

In 2020, a set of comprehensive and differentiating conditions for a plastic law, the **Senegalese anti-plastic law 2020-04**, was amended. It does not only ban plastic bags and prohibit certain single-used plastic products, disposable products and non-essential plastic products, for which there are sustainable alternatives, it also introduced a deposit system for plastic bottles, posed an obligation to incorporate recycled plastic in the production as well as demands an obligatory EPR system. Moreover, a tax on non-recyclable plastic has been imposed. These measures try to induce higher recycling and collection rates, reduce consumption of primary plastics and single-used products as well as increase the use of recycled materials. These conditions go beyond a ban itself and thereby addressing different levels and activities along the value chain, which specifically pushes different value chain stakeholders to approach the change. By setting targeted incentives for plastic producer, manufacturer, retail and consumer, the effort is shared, risks are minimised, and collaboration is stimulated.

As one of the first countries, Rwanda adopted a strict ban of plastic bags with a thickness of 60 microns in 2008. This has been revised and extended in 2019 to all types of plastic bags and single-use items. The new law also includes EPR elements, namely first, an environmental levy on imports of goods packaged in plastic materials. Second, it demands from manufacturers, wholesalers or retailers of plastic bags or single-use items to establish a mechanism to collect and segregate these with the aim to hand them over to recycling plants⁴⁸. Due to Rwanda's very strong enforcement measures, including inspections, high penalty fees or imprisonment, and their clear execution through one agency (Rwanda Environmental Management Authority), this policy has been proven to be effective and contributed to Rwanda's reputation of being the cleanest country in Africa.⁴⁹

Another outstanding policy is the **Nigerian Extended Producer Responsibility Programme**, launched in 2016. It counts as Nigeria's ninth EPR policy and represents a framework of action for a collaborative partnership approach between the government, businesses and the civil society towards zero-waste. The overall objective of this programme is to ensure a decrease of total environmental impacts from products, including their packaging. The National Environmental Standards and Regulations Enforcement Agency (NESREA) has commenced the registration of operators in the EPR Programme, including producers and first importers, producer responsibility organisations, recyclers and collectors.⁵⁰ Under the National Policy on Plastic Waste Management (2020) levy and sector user charges on single use plastic are imposed under the EPR Programme, which will be in effect from May 2021. This policy together with other policies around waste management serve as framework for a transition to a green and circular economy. A foundation is now made for CE when it comes to plastics, where the design and production fully comply with the 5R's (Reduce, Reuse, Repair, Recycle and Recovery). If successful, this could set an example to be extended to other priority sectors, such as textiles.

In 2018, Zambia published an EPR policy which is worth mentioning. The **Extended Producer Responsibility Statutory Instrument No. 65** extends the responsibility of the producer of a product or class of products to the post-consumer stage. It places an obligation on producers that have potential to pollute the environment to minimise waste through treatment, reclamation, re-use, recovery or

⁴⁸ [Law no. 37 of 23/09/2019](#)

⁴⁹ According to an interview held with Israel Dufatanye, inspector at REMA, on the 15/12/20.

⁵⁰ NESREA (n.d.) [Extended Producer Responsibility \(EPR\) Programme](#)

recycling. It regulates the following fourteen packaging material types: Cartons, non-returnable glass bottles, non-returnable plastic bottles, plastic carrier bags and flat bags below 30 microns, beverage cans, waste oils, waste lubricant containers, used lead acid batteries, pesticides containers/packaging, chemicals containers/packaging, expired chemicals, used tyres, near end of life or end of life electrical and electronics, electrical and electronic equipment.⁵¹ Due to the limited enforcement capacity of Zambia's environmental management agency, many companies can still get away with not complying to the new EPR rules – especially SMEs.⁵² Larger (international) enterprises are more eager to comply with the new EPR requirements, due to the risk of negative publicity and because they have a higher chance of getting compliance checks.

Another example worth mentioning is the **revision of the Kenyan building code** which is currently undergoing legal drafting. The Local Government Building Order 1968, containing the building code, will be complemented by the National Building Regulation 2020. Whereas the former is prescriptively material based, the latter is performance based. This new regulation will make it possible to use materials performing a certain function for as long as they meet the approved criteria for that purpose. It therefore creates room to utilise other innovative materials and/or reuse them to attain the same or similar function. Any material salvaged or recovered from a construction site can be reused if it remains sound and fit for purpose. Materials that could be considered as unusable debris, may also be reconstituted into a different product and be reused. Compliance and performance will be tested by the relevant standard body, achieving a known Kenya Standard or its equivalent. This revision will enable increased reuse and recycling of construction materials which yet have only been possible on a restricted basis.⁵³

Other examples from the case study countries come from Morocco. Within the Framework Law No. 99-12 on the National Charter for the Environment and Sustainable Development, in particular Article 30, Morocco has introduced an **ecological tax of 1% ad valorem** on plastics and articles thereof (raw materials, semi-finished products, finished products and plastic waste). The objective of this law is to develop the recycling and recovery of plastic waste. Also, under the Foreign Trade Law and the Basel Convention, Morocco has established export licenses for wastepaper and cardboard as well as for waste PET bottles to ensure the continuous supply of the recycling and recovery waste into these waste industries. This will help to develop investment in industrial and energy recovery projects for waste. Morocco also calls, in chapter 4 of the Organic Law on Environmental Protection, Conservation and Management, for the need to subject projects to mandatory **Environmental Impact Assessment**. This represents an essential step towards minimising and mitigating negative social and environmental impacts of emerging projects by better informing stakeholders, especially investors, about short and long-term effects.

Box 2-1 Enabling conditions for a Circular Economy

There are several interrelated factors which are essential to ensure a thriving circular economy. In the following, the most important and overarching ones are briefly described.

Economic stability

A certain degree of economic activity and progress which has stabilised over a given period of time, is key to provide an enabling environment for emerging economies, innovations and, more specifically, circular products and services. On the market side, economic stability implies a certain level of investment and demand to help circular

⁵¹ According to the interview with Tobias Muyaba from Zambia on the 27/10/20.

⁵² *Ibid*

⁵³ According to the communication with Kariuki Waweru on the 23/07/20.

businesses and initiatives to take- and scale up⁵⁴. On the business side, it provides more security for entrepreneurs and organisations to dare stepping out of business as usual. This especially applies to local industries fundamental for the circular economy, such as recycling or reuse facilities, that have to be built up, maintained and/or expanded. Another enabling dynamic that economic stability brings, is “coopetition” which naturally enhances innovation.

Political stability and conducive policy frameworks

A successful implementation of circular economy related, but also more general policies, demands political stability. Ideally, it includes a democratic system, low level of corruption and high level of governmental trust. Another related role of policymaking is the designing of well-balanced policies and frameworks that are aimed at supporting and maintaining economic stability⁵⁵ and which embraces the circular economy. These policies need to clearly define objectives, identify stakeholder and their roles as well as suggest impact assessment measurements that provide guidance during the implementation.

Driving investment - Strategic investment framework

In connection to economic stability, strategic investment frameworks help directing investments into the right CE-related sectors. In combination, programmes targeting the private sector, especially micro and small sized enterprises, e.g., Business Development Financial Support (BDS), help strengthening the businesses from within. Therefore, political reforms should promote and assign a leading role in the economy to the private formal and informal sector.

Material and product standards

Standards that demand CE principles to be integrated in the design and production of products, are an important means to facilitate decisions in favour of the environment; they support producers in reaching compliance and phasing out of environmentally harmful materials.

Enforcement

Another enabling element is the enforcement of standards and regulations pertaining to environmental and waste management through dedicated and independent agencies. Regulatory and control mechanisms can promote circular economy principles and their compliance. This supports the establishment of a national institutional mechanism for environmental protection⁵⁶.

Both standards and their enforcement should be aligned across countries and regional blocks to harmonise the process instead of creating additional burdens.

Collaboration

Throughout policies, action plans and strategies, greater cooperation is needed at all levels of government and also between the private and public sectors to agree on common rules and standards that will enable the mainstreaming of CE principles across sectors. Especially, in policymaking and policy implementation, the involvement of and collaboration between different Ministries, like the Ministry of Environment, Ministry of Economy, Ministry of Trade, Ministry of Transport and Infrastructure or Ministry of Water and Sanitation, is essential to accelerate the progress-making towards circular economy.

Transparency

Transparency is an element that should be given priority across different fields, most obviously in policy-making and public-private cooperation. Especially while transitioning toward a more democratic system, transparency is fundamental as it breaks the cycle of distrust and the lack of accountability of policymaker. But also, in terms of

⁵⁴ The following study confirms that factors like economic growth rate, real exchange rate or foreign trade to GDP have significant causal relationships with real private investment in developing economies: R. A. Rathanasiri (2009) [Economic Stability and Private Investment in Developing Countries: The Case of Sri Lanka](#)

⁵⁵ United Nations (2020) [World Economic Situation and Prospect](#)

⁵⁶ A best practice example is the [National Environmental Standards and Regulations Enforcement Agency \(NESREA\)](#) in Nigeria.

investments, transparency can help to make more informed investment decisions, e.g., by being able to better assess the short and long-term impacts. Moreover, transparency is the base for collaboration. It demands openness and trust which can only be build up if the partners share insights and experiences without holding back information to their own advantage⁵⁷.

Data management and monitoring

Having information and data available and accessible as well as key indicators developed, help to evaluate, analyse and optimise transition processes and the effectiveness of different tools applied or programmes designed. Learnings can be derived for future initiatives and/or other countries to follow. A proper data management and monitoring also facilitates the information flows to policy which can react accordingly shaping or adjusting policy tools and frameworks.

In addition to concrete policy examples, the recent formation of the Parliamentary Network for CE in Cameroon is appropriate to mention here. The network was launched in September 2020 and kickstarted with a multi-stakeholder workshop during the ongoing ordinary parliamentary sessions in November. These initiatives may be a lever for initiating the development of CE policies, thus, advancing the CE transition.⁵⁸

2.2 Overall trends relevant to the circular economy

2.2.1 Trends in resource extraction and consumption

Between 2000 and 2017, domestic material consumption in Africa grew with 70%. However, this growth was largely driven by population growth, as per capita consumption grew with only 19% during the same period (Figure 2-1). Also, GDP per capita grew with 33%⁵⁹ during this period, meaning that economic growth per capita outpaced growth in material consumption per capita. Indeed, Africa's resource productivity increased as its resource consumption per unit of GDP declined with 12%. Also, the African economy seems to have become less dependent on material *extraction* for its economic growth. Whereas in 2000 3.5 kg of raw materials were *extracted* per US\$, this declined to only 2.6 kg /\$US in 2017.⁶⁰ Still, the resource productivity of the African economy is rather low compared to the world average and especially Europe, where the production of \$1 of economic output require only 1.2 kg and 0.5 kg of material extraction, respectively. This shows the relative importance of the extraction sector in Africa as well as the dependence of other world regions like Europe on raw material imports.

Due to the relatively low-income levels in Africa, the relative level of material consumption is the lowest of all world regions. The domestic material consumption⁶¹ per capita in Africa has grown only slightly during the last two decades and in 2017 it was 63% lower than that of the average inhabitant of Asia, 65% lower than the average European and even 83% lower than the average person in North America (

⁵⁷ Another good practice example comes from Nigeria where the extractive industries lead to improved investment in climate by providing a clear signal to investors and international financial institutions that the government is committed to greater transparency. As a result, Nigeria joined the Extractive Industries Transparency Initiative in 2019.

⁵⁸ According to the interview with Joyceline Landry Tsonang from Cameroon on the 11/11/20.

⁵⁹ Excluding Djibouti, Eritrea, Somalia and South Sudan due to missing data.

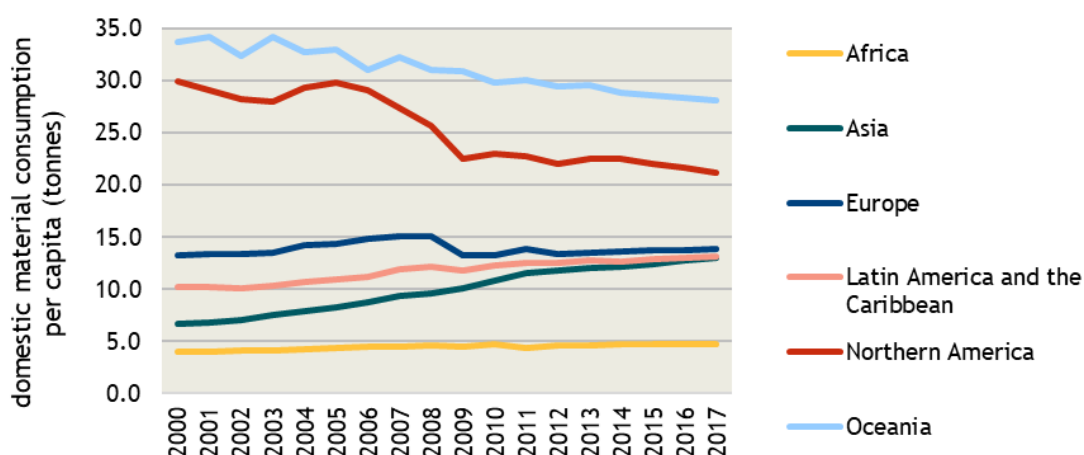
⁶⁰ Corrected for inflation using constant 2010 US\$ values.

⁶¹ Domestic material consumption = Domestic material extraction + material imports - material exports.

Figure 2-1). Globally, Africa accounts for approximately 6% of the overall material consumption and this share has remained relatively stable during the last twenty years. Within Africa, Egypt is the largest material consumer, followed by Nigeria and South Africa, the two largest economies on the continent (There are many “traditional” practices in Africa, that are inherently circular and resource efficient, especially in rural communities. However, especially in urban communities such practices are increasingly abandoned and exchanged for a consumerist lifestyle. As such, there is a need to revive some of the good practices that are embedded in the culture of many African countries. Here, private companies have an important responsibility as they can help preserve such good practices or undermine them by introducing and promoting a “throw-away lifestyle”.

Figure 2-2).

Figure 2-1 Domestic material consumption per capita by world region (tonnes)



Source: UNEP database - Statistics SDG 8

When looking at the most important material categories consumed in Africa, we see that biomass (for food and materials) and fossil fuels represent the largest part and the consumption of these material groups has grown substantially during the last two decades (Figure 2-3). When looking at non-metallic minerals we see that Africa extracts much more than it consumes, meaning that a large part of the extraction is destined for exports. The consumption and extraction of metals are more or less balanced.

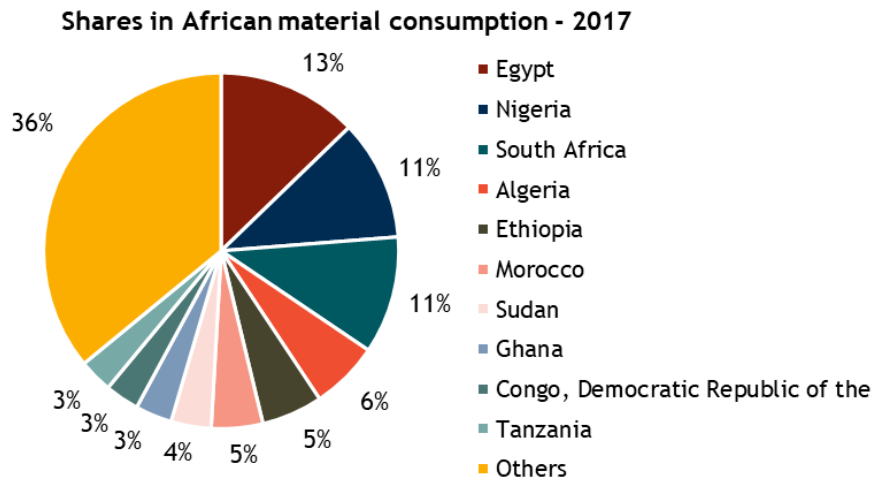
To date income levels are still very low in most African countries. The median per capita household expenditures (corrected for power purchasing parity) in Africa were around € 2,300 compared to € 16,525 in the EU. With strong economic growth outlooks for Africa, the question is whether it can sustain growing welfare levels in combination, while keeping growth in resource consumption in check. Making circular economy a centrepiece of economic growth strategies in African countries could help the continent to achieve stable economic growth and create job opportunities in a resource efficient and sustainable manner. In 2013, only 33.9% of the African population belonged to the Middle-income class or upper income class, but by 2030 this will have increased to 42.7% (an additional 259 M people),⁶² and this trend is expected to continue beyond 2030. As a consequence of higher incomes consumption expenditures will increase which will most likely lead to a growing resource use footprint. The OECD estimates that under a Business As Usual scenario, the material consumption in Africa will grow from around 6 Gt in 2017, to 7.5 Gt by 2030 and around 22 Gt by 2060 (Figure 2-4).⁶³ There are many “traditional” practices in Africa, that are inherently circular and resource efficient, especially in rural communities. However, especially in urban communities such practices are increasingly abandoned and exchanged for a consumerist lifestyle.⁶⁴ As such, there is a need to revive some of the good practices that are embedded in the culture of many African countries. Here, private companies have an important responsibility as they can help preserve such good practices or undermine them by introducing and promoting a “throw-away lifestyle”.

⁶² Signé, L. (2018) [Africa’s consumer market potential - Trends, drivers, opportunities and strategies](#)

⁶³ OECD (2019) [Global Material Resources Outlook to 2060: Economic Drivers and Environmental Consequences](#). OECD Publishing, Paris. <https://doi.org/10.1787/9789264307452-en>

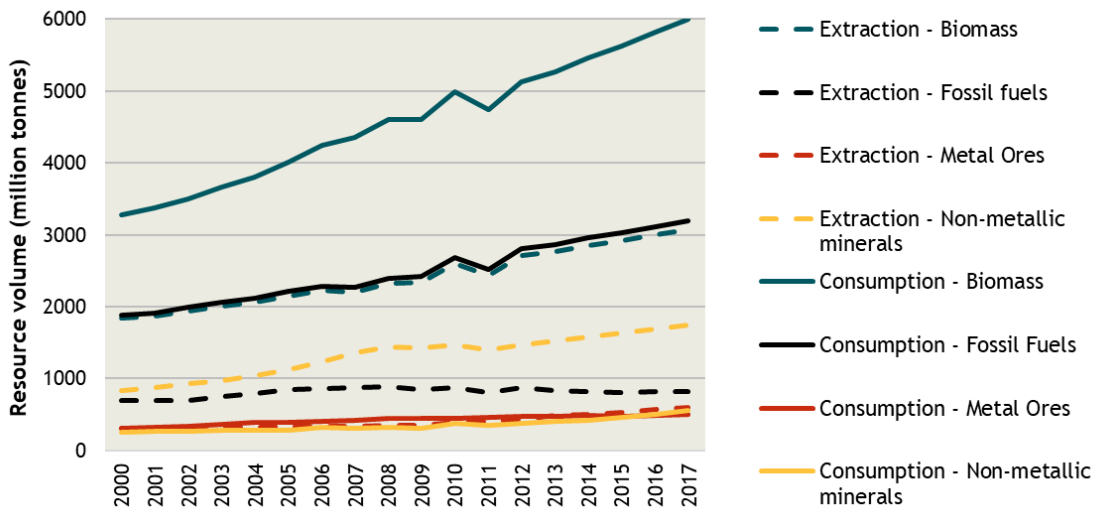
⁶⁴ According to the interview with Tobias Muyaba (environmental consultant, Zambia) - 27/10/2020.

Figure 2-2 Domestic material consumption in Africa by country, 2017



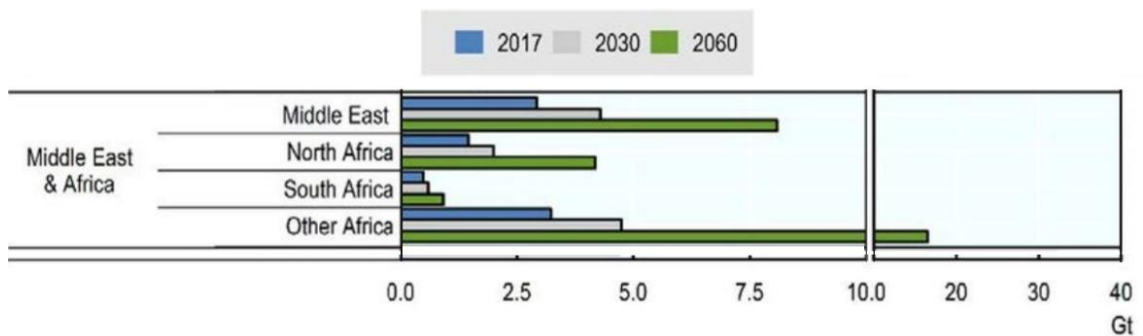
Source: UNEP database - Statistics SDG 8

Figure 2-3 Domestic material extraction (dotted lines) and consumption (solid lines) in Africa by material type



Source: UNEP database - Statistics SDG 8

Figure 2-4 Outlook for resource consumption in Africa in the Middle East under a business-as-usual scenario
Materials use in Gt



Source: OECD (2018) *Global Material Resources Outlook to 2060 - Economic drivers and environmental consequences*. OECD Publishing, Paris. DOI: <https://doi.org/10.1787/9789264307452-en>

2.2.2 Trends and opportunities in key sectors

In essence, the circular economy is a holistic concept that encompasses a systemic shift in the way in which economic activities are undertaken, which means that all sectors of the economy will be affected. However, there is a set of sectors where there are some 'low-hanging fruits' in terms of circular economy benefits.

Focus sectors in this study and a justification of their selection

In our research we have selected five key sectors, namely:

- The Agri-food sector;
- The Construction sector;
- ICT and Electronics;
- Plastics and packaging;
- The waste management and recycling sector as a cross-cutting sector.

These sectors were selected based on the bottom-up analysis done in our eight case study countries, based on the following elements:

- overall economic importance of the sector;
- CE potential;
- the level of ongoing CE activities;
- linkages to urgent environmental issues.

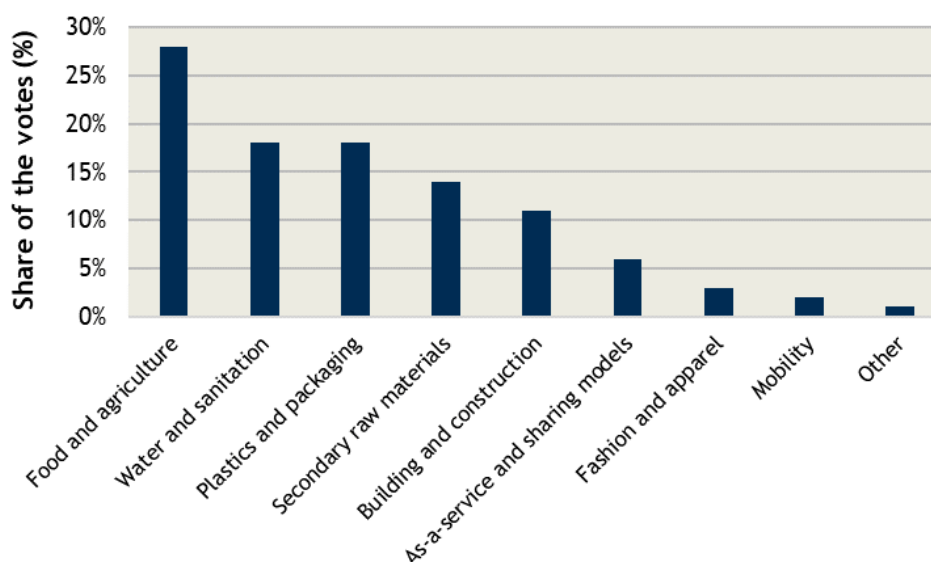
The economic importance was assessed based on national accounts whereas the other elements were analysed through a combination of literature research, interviews and expert judgment by the country experts. Even though there were small differences among countries, similar sectors emerged as priority sectors across the board. The selected sectors largely match the priority sectors from the European CEAP. However, in our analysis, we neither included the textiles sector nor the batteries and vehicles sector. This is due to the fact that this study focussed on the most important and promising sectors in the short term, defining those in which potentials can be exploited relatively fast with given resources, capacities and infrastructures, only requiring a minimal to medium additional input/effort. The textile sector is rather concentrated in a few countries, like Kenya and some other East African countries. Even though the textiles sector was not analysed extensively in this report, given the growing problems around accumulating textile waste and the importance of some stages of the textiles value chain in several African countries, a short section in this chapter discusses some of the issues and CE opportunities in this industry.

Lastly, batteries and vehicles sector only represents a very limited share of Africa's economy. Still, these two sectors do represent CE potential in the long-term. It should be noted though that even though the battery sector itself is rather limited in Africa, the continent is an essential supplier of some of the rare elements that are needed for the production of batteries such as cobalt and some rare-earth metals. Europe's ambition to strive for sustainable production and consumption processes will also mean that the growth in demand for batteries and the resources needed for their production will not aggravate the environmental and social associated with the extraction of these materials.

Together the selected set of sectors represent a large part of the value creation, resource consumption and waste generation in the African economy. The agri-food sector accounts for roughly 20%⁶⁵ of Africa's GDP and agriculture only accounts for 48% of the employment in the continent.⁶⁶ Apart from that, the sector has a key role to play in improving Africa's food security and circular strategies can help to bridge the existing yield gap. The construction sector accounts for around 8.5% of Africa's GDP and is responsible for a substantial share of the material consumption in the continent (non-metallic mineral consumption only already accounted for a quarter of the material consumption in Africa in 2017). The electronics & ICT sector and plastic sector are relatively small sectors when it comes to manufacturing as most of the products associated with these sectors are imported. However, these sectors represent major waste streams in Africa that are associated with important environmental problems, are tackled by many bottom-up initiatives and hold further significant potentials for improvements. For the same reason, we will discuss the waste sector, not because of its economic significance, but because of its central enabling role in a shift to a circular economy.

To validate our selection of priority sectors we have discussed our selection with similar CE studies and initiatives and there was a broad consensus on the selection of these sectors among stakeholders. Within the discussions surrounding the African Circular Economy Alliance strategy, the same priority sectors have been identified, with the textiles sector as an additional sector. Furthermore, during the 2020 edition of the World Circular Economy Forum, a dedicated session on the CE in Africa, was held and participants were asked to vote for the sectors which they thought to have the highest CE potential in Africa. Again, the results largely confirm the priority sectors identified in our analysis (Figure 2-5).

Figure 2-5 Opinion of participants (N=347) of the CE in Africa session in the WCEF 2020 on CE priority sectors in Africa



Classification of CE activities and strategies

For each sector, the relevance of the CE is explained; present ongoing CE initiatives and/or policies are described and hindrances and solutions to advance the CE are discussed. We touch upon practices and

⁶⁵ Estimate as for most African countries data on the food manufacturing sector is lacking.

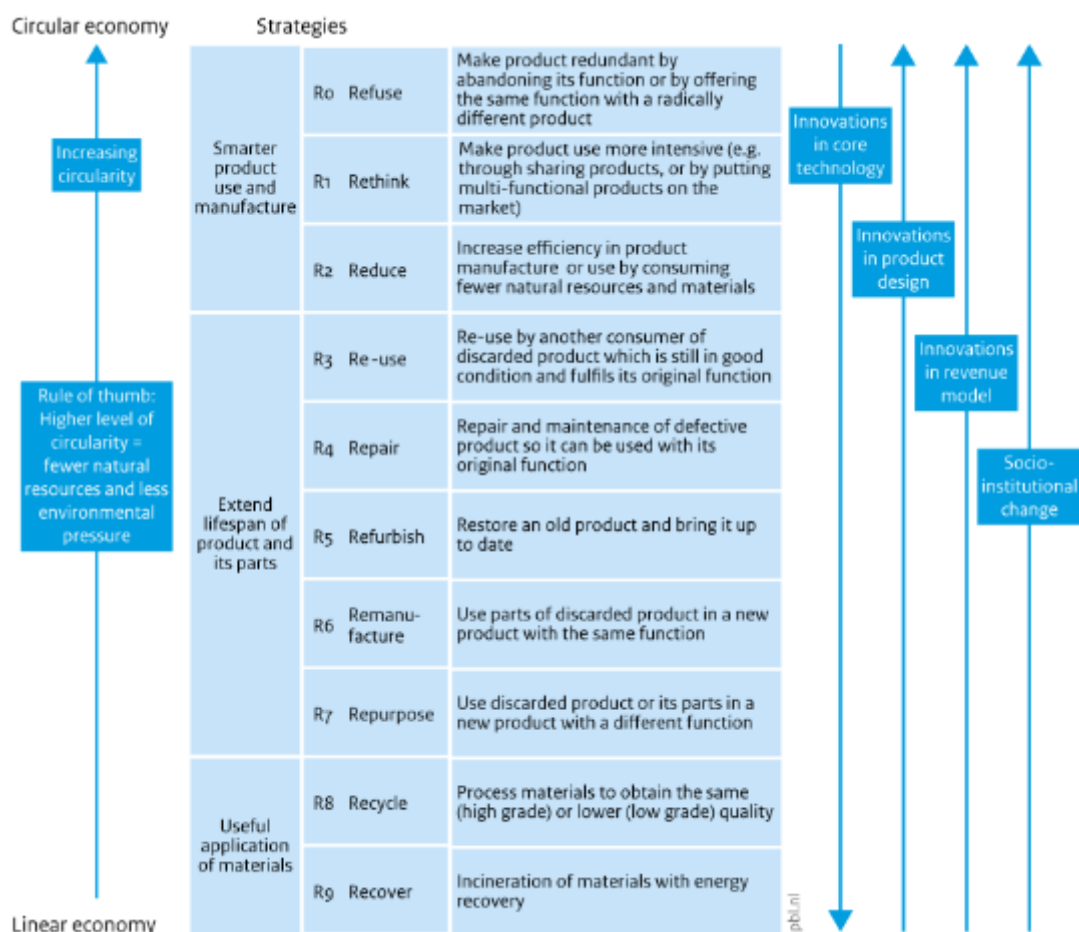
⁶⁶ Based on a weighted average World Bank data on Employment in agriculture (% of total employment) (modeled ILO estimate) for 53 African countries, by combining the employment share with the size of the population aged 15-64.

solutions covering a wide range of CE strategies across different stages of the value chain from design solutions aiming to reducing the use of raw materials or to using less wasteful and renewable materials ('reduce' principle in circular economy) to practices that allow for refurbishment or repair for further or new use ('reuse' principle), to treatment for obtaining secondary materials to be used in other applications (recycle). The Dutch Environmental Assessment Agency (PBL) developed a system to categories different CE strategies in the so-called R-framework or R-ladder (Figure 2-6). The higher the R-strategy the higher the environmental benefits and cost savings. Even though circular economy policies are often associated with waste policies, especially in Africa, it is important to realise that only two of the 9 R-strategies apply to the end-of-life phase of products. The CE actions with most economic environmental potential affect earlier stages of the lifecycle of products and are focused on waste prevention and the extension of product lifetime.

We have attempted to address as much as possible a broad range of CE activities across the R-ladder for each of the focus sectors described in the following subchapters. To make it easier to see which R-strategies are applied in each sector, the CE activities described are labelled according to this framework. It should be noted though, that even though a substantial number of high-ranking R-strategies are applied in Africa, activities affecting the end-of-life stage dominate in the following sections for several reasons:

1. African countries are an important destination for second-hand products and (illegal) waste shipments and therefore waste is a disproportionately large problem in Africa. The CE represents a strategy to address this urgent problem, while simultaneously creating employment opportunities. Hence, CE policies in many African countries have mostly focused on the waste sector;
2. Using products as long as possible and reusing products that were no longer needed by others is still common practice in Africa. In many African countries the consumption society and the throw-away mentality has not yet gotten a foothold as it has in many countries in the global north. In this sense, it will be more important to retain and protect these valuable practices embedded in African cultures rather than to promote them from scratch. This means that initiatives aimed at the strategies *refuse*, *rethink* and *reduce* are less commonly found than in CE initiatives in European countries;
3. When looking at some of the strategies aimed at extending the lifetime of products, we see that repair is a widespread practice in Africa, but refurbishment and especially remanufacturing activities are far less common. To a large extent this is also related to the general lack of manufacturing capacities. As African countries are often importers of products rather than producers, refurbishment and remanufacturing strategies are more difficult to organise.

Figure 2-6 R-framework showing different CE strategies in order of prioritisation (1 highest, 9 lowest)



Source: PBL (2017) Circular economy: measuring innovation in the product chain

Agri-food sector

The central role of the agri-food sector in the African economy

In Africa, the agri-food sector still forms the backbone of many national economies. In 2017, agriculture accounted for 16% of the GDP in Africa, compared to 1.7% in the EU. The sector is also a major source of employment in the continent. However, in most countries the sector is dominated by subsistence farming and other types of small-scale farming and the overall productivity is still rather low.

Due to the low productivity levels Africa is still a net importer of raw and processed food products, representing an average trade deficit of € 30.7 bn in 2017. However, to some extent the overall African figure is misleading as it is largely skewed by a few large importers, namely Nigeria, Angola, the Democratic Republic of the Congo and Somalia which together account for most of the trade deficit.⁶⁷ At the same time, food exports have in on the rise during the last decade and many African countries are in the meantime net food exporters. Also, while net trade deficits for food products were on the rise during the early 2000s, they have remained rather stable during the last decade, despite the increase in food demand due to a strongly growing population and an increase in economic welfare which shows that to some extent Africa has successfully increased its food production output.⁶⁸

⁶⁷ Fox & Jayne (2020) [Unpacking the misconceptions about Africa’s food imports](#)

⁶⁸ *Ibid*

Notwithstanding the recent growth in Africa's agricultural output, the overall agricultural productivity levels in Africa are still relatively low compared to other world regions. This can be explained by a combination of relatively low yields per hectare⁶⁹ and relatively high levels of post-harvest losses. After harvest, significant shares of the crops produced are lost due to poor handling and storage and inadequate distribution and logistics. In our study we estimate that when looking at Africa as a whole, a total value of post-harvest losses may be equivalent to 1% of Africa's GDP or roughly € 22 bn EUR.

Increasing agricultural productivity: mechanisation, fertilizers & food loss reduction

The majority of food losses occur at post-harvest and processing stages –between initial agricultural production and final household consumption. The data on post-harvest food waste is very scarce, however, based on estimation from FAO from 2011, 37% of food produced in Sub-Saharan Africa is lost which equals to 120-170 kg per capita per year.⁷⁰ Fruits and vegetables, roots and tubers, and sea food are especially vulnerable. Most of the losses result from the lack of reliable modern storage and processing technologies, inappropriate harvesting periods, inappropriate packaging, material, poor field sanitation, poor road infrastructure, inappropriate modes of transport and the lack of reliable markets.

Besides resulting in immediate economic benefits and the reduction of GHG emissions, the reduction in food losses could have a significant impact on the livelihoods of millions of small-holder farmers who live on the margins of food insecurity (**R-strategy R1- Reduce**). A lack of finance is often a barrier to the realisation of improved (cold) storage facilities. Rental of storage space such as provided by Coldhub (Box 2-2) or collective investments in shared storage facilities⁷¹ can provide a solution in such cases. On the other hand, proper management of food waste (once generated), such as through composting and anaerobic digestion, could contribute to food and energy security.⁷²

Box 2-2 Case study: Coldhub, Nigeria

Coldhub provides a modular, customisable, solar-powered walk-in cold room for 24/7 off-grid storage and preservation of perishable foods that extends the shelf life of perishable food from 2 days to 21 days. This addresses the problem of post-harvest food waste while giving more access to nutritious food for rural populations. Farmers pay a daily flat fee for each crate of food they store. Yet, they have reduced post-harvest food waste by extending shelf life of produce. With more of their harvest to sell, smallholder farmers will be able to increase their annual income by 25%. They also improved access to food for rural populations due to better cold storage facilities.

Source: [Website Coldhub](#)

Another important area of attention for agriculture to increase its productivity without drastically promoting linear economic practices is the use of fertilizers. In general, fertilizer use in most countries in sub-Sahara Africa is still very low, in comparison to other world regions (Instead of increasing the application of mineral fertilizers, the production and application of organic fertilizers such as compost or biochar or fertilizer products derived from the digestate of biogas production could be increased (**R-strategy R1 - Rethink**).

Figure 2-7). In many African countries, productivity could benefit from increased fertiliser use, but this could be done in a smarter, more sustainable and more affordable way than just resorting to increasing the application of mineral fertilizers. The production of nitrogen fertilizers is an important source of GHG emissions and the growing demand for mineral phosphate leads to dwindling global phosphate rock

⁶⁹ Henderson *et al.* (2016) [Closing system-wide yield gaps to increase food production and mitigate GHGs among mixed crop-livestock smallholders in Sub-Saharan Africa](#)

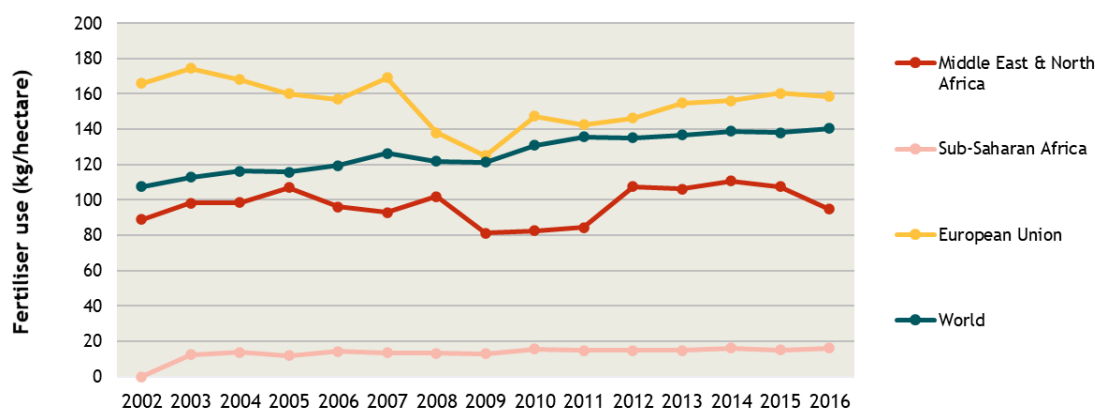
⁷⁰ The World Bank, Natural Resource Institute and the FAO (2011) [Missing food: the case of postharvest grain losses in Sub-Saharan Africa](#)

⁷¹ According to an interview with Bezawit Eshetu (Expert CE measures in agriculture) - 28-10-2020.

⁷² UNEP (2018) [Africa Waste Management Outlook](#)

reserves. Instead of increasing the application of mineral fertilizers, the production and application of organic fertilizers such as compost or biochar or fertilizer products derived from the digestate of biogas production could be increased (**R-strategy R1 - Rethink**).

Figure 2-7 Fertilizer use in sub-Saharan Africa and the MENA region compared to the global and EU average



Source: World Bank (2020) World Development Indicators - Fertilizer application per hectare

Box 2-3 Case study: Safi Organics, Kenya

Safi Organics, Kenya

Safi Organics is a Kenyan eco-inclusive enterprise that is specialised in the decentralised production of fertiliser using locally available resources and labour. The company has created an agricultural value chain from local organic waste streams. It developed an open-source technology that enable them to transform rice husk collected from local rice farmers into high quality organic biochar using efficient low-cost biochar converters⁷³. The fertiliser and soil treatments are sold back to the farmers via agents or directly. The local circular economy created by these actions enables farmers to exploit the value of their waste in an environmentally friendly manner, while giving them access to cheaper fertilisers and soils treatments.⁷⁴

With its activities, Safi Organics reverse declining agricultural yields, improve the income and food security of local farmers, and provide opportunities for local youth. The enterprise already trained 400 local farmers in the use of organic fertiliser.

Source: European Commission (2020) Kenya Country Report - Circular Economy in the EU-Africa Cooperation

Box 2-4 Case study: Hello Tractor, Nigeria

Hello Tractor, Nigeria

Hello Tractor was founded in 2014 and is a diversified agricultural-tech company that works across the tractor ecosystem to ensure farmers, tractor contractors, tractor dealers, and tractor Original Equipment Manufacturers are successful. Through its services, it also contributes to improving food and income security throughout sub-Saharan Africa. It currently focusses on Nigeria, while being active across Senegal, South Africa, Tanzania, Mozambique and Kenya as well. To enhance their ability to positively impact farmer's lives, Hello Tractor actively partners with industry, government, NGOs, civil society and farming cooperatives.

Typically, most buyers of compact tractors purchase those assets as an income-generating business opportunity. The Hello Tractor platform connects tractor owners to farmers offering a tractor rental through a digital app, making it easier and less risky for tractor owners to run their businesses while connecting smallholder farmers to

⁷³ Safi Organics (2017) [Agricultural waste is the new gold mine in Mwea](#)

⁷⁴ Kenya Association of Manufacturers (2019); Ghosh (2020). Circular Economy: Global Perspective

machinery that let them plant 40 times faster at one-third of the cost. By cutting down on the labour that is typically associated with farming, Hello Tractor is making it easy and lucrative for all users.

Hello Tractor partnered with Aeris, a leader in IoT connectivity for its deep expertise in helping to deliver data solutions to the market. With Aeris, Hello Tractor is able to offer its technologies at global scale and leverage a team of data scientists that enable precision farming and machine learning at a stallholder appropriate scale.

Source: [Koan \(2020\)](#) and [Hello Tractor \(2020\)](#)

Distribution and consumption

In contrast to many industrialised countries, food losses at the consumption stage are more limited in most African countries as people typically waste less food, mostly due to lower average incomes. However, substantial amounts of food are still lost due to poor transportation methods (bulk transport where products can get bruised because of the weight) and also due to bad roads. Transport using proper packaging, e.g., in reusable crates can reduce damage and food loss during transport.⁷⁵

The food and beverages sector is also responsible for a large part of the packaging waste. In this respect, innovative solutions like the milk ATM from Kenya⁷⁶ or other types of food dispensers can help to reduce the amount of single-use packaging needed by providing unpackaged food and drink products, even at a lower cost than packaged products (**R-strategies - R1 & R2 Rethink and reduce**). At the same time, better packaging can sometimes contribute to reducing food loss by preventing spoilage of food. Therefore, it is important that the environmental impact is assessed at the level of the entire lifecycle of a packaged product. For some resource/emission-intensive products (e.g., meat) the marginal increase in environmental impact due to improved packaging might be more than compensated by the environmental benefits of reduced losses of such products.⁷⁷

Optimising the use of agricultural and other organic wastes

Even though it is always preferable to prevent waste as much as possible some level of agricultural waste and other forms of organic wastes will always be generated. Generally, African farmers are already quite efficient in their use of crop residues and other forms of organic “waste” as organic fertilizer as this is the most affordable form of soil fertilization (**R8 - Recycle**). However, significant volumes of organic waste are still ending up in landfills, representing the most abundant type of waste in many landfills. In this way organic waste gets mixed with non-renewable wastes, which prevents the use of this resource for economically valuable purposes. Past projects in East Africa have shown that organic waste can be used successfully to grow insect larvae that can be used for food and feed products (**R8 - Recycle**).⁷⁸ Similar activities where organic waste is used for feed production are ongoing in Nigeria, South Africa, Tanzania and Uganda.⁷⁹ For the organic waste that cannot be used for the production of high value products there is always the possibility to use it for biogas production in an anaerobic digester, producing organic fertilizer as a side product or to compost it. In the results of a preliminary scan of circular bottom-up initiatives in Africa, eight initiatives active in the production of organic fertilizers from organic waste were identified.⁸⁰

⁷⁵ Kilelu & Kithinji (2019) [Milk ATM growth in Kenya's milk retail system - trends and scenarios](#)

⁷⁶ The Postharvest Education Foundation (2013) [Returnable Plastic Crate \(RPC\) systems can reduce postharvest losses and improve earnings for fresh produce operations](#)

⁷⁷ Wohner *et al.* (2019) Packaging-Related Food Losses and Waste: An Overview of Drivers and Issues. *Sustainability* 11(1):264. DOI: 10.3390/su11010264

⁷⁸ Wageningen University (2019) [Insects for animal feed in East Africa - Presentation 10-01-2019](#)

⁷⁹ Footprints Africa (2021) [The Circular Economy: Our journey in Africa so far](#)

⁸⁰ *Ibid*

Construction

The construction sector is of strategic importance for the development of African countries and economies, providing growth and employment. In most of the African countries, the sector is on the rise, both in number of projects and in GDP contribution. South Africa is an exception, with the sector under significant pressure due to declining spending on infrastructure and statistics in South Africa reporting high numbers of jobs lost in 2019.⁸¹ East Africa has seen most growth in value of the construction sector while North African countries have experienced growth in number of construction projects⁸². This is due to rapid population growth (which goes hand in hand with expansion of the built environment), urbanisation and urban sprawl, and increasing Foreign Direct Investment (as international investors invest in infrastructure projects). By 2050, the African population is projected to reach 2.4 billion, and by 2030, urban populations will increase by an additional 350 million people.⁸³

A growing construction sector implies an increasing extraction and consumption of non-metallic resources, such as sand gravel or crushed rock, which also includes construction-related minerals, like limestone. Considering current unregulated mining of raw materials in ecologically sensitive sites take place (e.g., mining of sand and clay for bricks in wetlands, illegal sand winning in rivers, high levels of deforestation for fuel to burn bricks and produce charcoal, etc), additional demand for materials can worsen the situation. The construction sector is also responsible for producing large and rising amounts of building-related waste which is often disposed in landfills mixed with the domestic waste or used to fill an old extraction field of natural aggregates.

In light of all of this, the circular economy, with its principles of Reducing, Reusing, Recycling and Rebuying materials, is key. Reusing construction and demolition materials helps reduce waste (tackling pressing issues such as limited capacity and lifespan of their landfills), conserve natural resources, reduce greenhouse gases due to manufacturing and transportation-related emissions; offer a sustainable and an affordable alternative in a reality of rising virgin material prices; and achieve cost-savings from avoided transportation and landfilling. In addition, as a result of urbanisation, housing demand is on the rise across several countries in the continent (for instance in Kenya, Egypt, Rwanda). The circular economy can play an important role in meeting the demand and in providing new approaches to creating resource efficient growth in the construction industry in Africa. An example is construction with modularity. This could be applied in low-cost housing projects, using prefabricated and modular container homes. Because deconstruction of modular constructions enables the building components to be carefully dismantled for reuse or recycling (instead of being demolished and landfilled), this approach is often more cost effective than disposal.

Generally, across Africa, circular construction is not a widespread practice yet (albeit informal recycling of construction happens to some extent) and there is little awareness about it. However, there is more and more evidence of construction-related circular economy driven by the private and the public sector. The following box gathers some examples of circular construction products and related services that have recently emerged. These include examples at different stages of the value chain from design (opting for natural, low-carbon materials) to recycling.

⁸¹ Stats SA (2019) [28 000 jobs lost in SA formal sector third quarter of 2019](#)

⁸² Mordor Intelligence (2019) [Africa construction market - growth, trends, and forecast \(2020 - 2025\)](#)

⁸³ WGBC (2020) [How green building is facilitating rapid sustainable growth in Africa](#)

Box 2-5 African initiatives in the construction sector

STRAWTEC Business Solution, Rwanda⁸⁴ (R1 - Rethink; R2 - Reduce)

STRAWTEC Business Solution (SBS) is a Kigali-based German company focused on sustainable, green building and construction technologies in Rwanda since December 2015. The company's vision is to become the ecological housing provider in Rwanda, delivering high quality and ecological housing for people of all paygrades. STRAWTEC provides an alternative to common cement made walls by replacing them with wheat and rice straw of high-quality. This technology has been existing for more than 80 years and has been used to build more than 250,000 houses in Europe, America and Oceania. Farmers often burn straw once wheat has been harvested and this pollutes the environment. Now they can sell that to STRAWTEC, which generates an additional income.

Interlocking Stabilised Soil Block (ISSB), Kenya (R1 - Rethink; R8 - Recycle)

Interlocking Stabilised Soil Block (ISSB) technology has been gaining recognition in East Africa, particularly in Kenya. ISSB are compressed blocks which are made of a mixture of soil, cement and water which are then compressed using a manual or mechanically operated machine. Kenya's small-scale builders have found ways to work both crushed glass, shredded plastic waste and agricultural residues into bricks that are otherwise made mostly from soil and therefore provide an attractive alternative to conventional building materials⁸⁵. These building blocks are cheaper than many conventional construction materials and simultaneously create local employment for companies involved in the processing of waste materials and manufacturing of the ISSBs.

Ecodome Maroc, Morocco (R3 - Reuse; R8 - Recycle)

Ecodome Maroc is a construction company specialised in the construction of housing and rural tourism accommodation in the form of domes, following ecological methods. It is an example of local and environmental-friendly construction using natural materials and non-hazardous C&D materials that can be reused or recycled. These materials include Acoustical ceiling tiles; Asphalt; Asphalt shingles; Bricks; Cardboard; Carpet and pad; Concrete; Dirt; Drywall; Fluorescent lights and ballasts; Insulation; Land clearing debris; Metals; Office waste (paper, cans, glass, plastic bottles and cardboard); Paint; Plastic film from packaging; Porcelain; Window glass; Wood. Ecodome construction is 40% quicker to build than conventional structures and provides people with limited income with an affordable home (compared to conventional construction). Its construction process reduces CO₂ emissions by up to 64% when compared to available techniques on the market.

Plastic bricks, Côte d'Ivoire (R8 - Recycle)

Côte d'Ivoire needs 15,000 classrooms for children without a place to learn. To help fill this gap, UNICEF has partnered with Conceptos Plasticos to open a factory that uses recycled plastic collected from polluted areas in and around Abidjan to build 500 classrooms for more than 25,000 children, with potential to increase production beyond. Once it is fully operational, the factory will recycle 9,600 tonnes of plastic waste a year, providing source of income in a formalised recycling market to women living in poverty. Nine classrooms have been built in Gonzagueville, Divo and Toumodi using plastic bricks made in Colombia, demonstrating the viability of the construction method and materials. The bricks will be made from 100% plastic and are fire resistant. They are 40% cheaper, 20% lighter and last longer than conventional building materials. They are also waterproof, well insulated and designed to resist heavy wind. Alongside investment to build in Côte d'Ivoire, plans are also under way to scale this project to other countries.⁸⁶ Similar activities are undertaken by the company Nelplast in Ghana, which uses plastic waste to produce a variety of construction materials.

Plastic bricks, South Africa (R8 - Recycle)

⁸⁴ STRAWTEC (n.d.)

⁸⁵ Rhono *et al* (2015) Characteristics of earth blocks stabilized with rice husk ash and cement

⁸⁶ UNICEF (2019) [Press Release. UNICEF breaks ground on Africa's first-of-its-kind recycled plastic brick factory in Côte d'Ivoire. In innovative partnership, factory will produce plastic bricks to build classrooms for children.](#)

The Centre for Regenerative Design and Collaboration (CRDC) is converting disposed plastic products into strong blocks called EcoArena pre-conditioned resin aggregate. Currently, the blocks are being tested in the Western Cape with two major cement manufacturers. The CRDC claim that the blocks 10% stronger than conventional cement blocks, and between 8% and 16% lighter, which ends up being more cost-effective when it comes to transport and construction.⁸⁷ The bricks, which look and feel like conventional cement bricks and can be cemented and plastered like any other brick, are particularly good at absorbing noise. EcoArena bricks are manufactured by turning plastic waste into small plastic particles that are mixed with a sand and cement mixture to create a durable and water-resistant brick. One of the most significant projects using EcoArena has been the construction of low-cost housing.⁸⁸

LocalWorks - construction with low-carbon materials, Uganda⁸⁹ (R1 - Rethink)

LocalWorks is a multi-disciplinary design collaborative, based in Kampala (Uganda) that specialises in the design and realisation of ecological architecture in East Africa. Architectural and construction practices such as LocalWorks in Kampala Uganda, are experimenting and constructing with low-carbon materials such as eucalyptus, sisal and earth in their projects. Within the design and construction stage, they also ensure that materials are designed to ensure minimum wastage during construction.

Digiyard: material exchange digital platform, South Africa (R3 - Re-use; R8 - Recycle)

Digiyard is a materials exchange platform launched by Arup in Green Cape. The platform, which is still in pilot phase, aims to reduce construction waste in landfills whilst addressing the need for affordable, quality building materials in the informal housing sector. Through the data gathered in the platform, construction companies will be able to understand of their material waste streams and minimise waste and increase efficiencies. The hope is that the platform will eventually operate as a web or mobile application including features such as machine learning algorithms to enable the smart recognition of materials. This would allow quick measurements and descriptions of items to be uploaded to a cloud portal instantaneously, providing convenience to suppliers. Mobile payments and a transport option to providing door to door delivery will also be explored to provide convenience for end-users.⁹⁰

It should be noted though that these sorts of developments are rarely referred to as ‘circular’ construction; instead, ‘green building’⁹¹ and to a lesser extent ‘sustainable’ construction are terms used more commonly. There are Green Building Councils (GBC) across Africa (in Ghana, Kenya, Mauritius, Namibia, Rwanda, South Africa, Tanzania and Zambia with some at inception phase e.g., in Botswana). These are working both individually and collectively as part of World GBC's Africa Regional Network in order to address barriers to green building, and thus implicitly, circular construction.

Besides products, policy developments that can be supportive of a circular economy in the construction sector are gradually emerging across various African countries. In Morocco for instance, two draft laws are being prepared: 1) a decree on the management of non-hazardous waste which will define the necessary requirements for all types of non-hazardous waste, including construction and demolition waste, addressing collection, selective sorting and ecological treatment; and which will also govern the terms and conditions for the authorisation of facilities for waste recovery⁹²; and 2) a decree that will

⁸⁷ AVERDA (2019) [South Africa can turn plastic waste into building blocks](#)

⁸⁸ IOL (2019) [Meet the sisters bringing the first plastic bricks to South Africa](#)

⁸⁹ [LocalWorks](#) (n.d.)

⁹⁰ Engineering News (2019) [Arup incubates a digital material transfer platform](#)

⁹¹ The World Green Building Council defines ‘green’ building as a building that, in its design, construction or operation, reduces or eliminates negative impacts, and can create positive impacts, on our climate and natural environment. Green buildings preserve precious natural resources and improve our quality of life. The features of a ‘green’ building may include: Efficient use of energy, water and other resources; Use of renewable energy, such as solar energy; Pollution and waste reduction measures, and the enabling of re-use and recycling; Good indoor environmental air quality; Use of materials that are non-toxic, ethical and sustainable; Consideration of the environment in design, construction and operation; Consideration of the quality of life of occupants in design, construction and operation; A design that enables adaptation to a changing environment.

⁹² Sweepnet (2014) [Report on Solid Waste Management in Morocco](#)

deal with the introduction of a minimum threshold for sorting in-situ. The first decree is in its final stage of validation; the second decree is under development. South Africa, where landfilling of construction and demolition waste is still the case, is calling for the recovery of C&D waste in its '2019 Revised and Updated National Waste Management Strategy'⁹³ which requires the implementation of the waste hierarchy. In practice, with respect to C&D waste materials, building rubble recycling is limited to single operations in the metropolises namely Cape Town (Western Cape), Johannesburg (Gauteng) and Durban (and KwaZulu-Natal).⁹⁴

Box 2-6 Financing of C&D waste collection and Private Sector Involvement in Rabat, Morocco

Financing of C&D waste collection and Private Sector Involvement in Rabat, Morocco

In Morocco, Rabat has established a separate construction, demolition and green waste contract with a waste management company which delegates the collection and disposal of construction and demolition waste, along with green waste. The 7-year service contract between the municipality of Rabat and the company Sita El Beda amounts to 142.8 million DH (€13.2 million), which is equal to 20 million DH (€1.8 million) per year, at a cost of 171 DH (€16) per ton. The initiative is fully financed by the municipality of Rabat. According to the statistics, approximately 90% of the construction, demolition and organic waste are collected thanks to this, which equals to 119,500 Mt.⁹⁵

Despite the various ongoing initiatives, products and policy developments, the CE in Africa's construction sector is still in its infancy. In many cases, the sector is being hindered by the existing regulations and policies as well as significant knowledge gaps. Below we elaborate on these barriers and we formulate recommendations to combat those, elaborating on the role the EU can play.

The existing unsupportive construction legislation and building codes

On the one hand, Africa has outdated building codes that do not mandate the adoption of green and circular principles, and on the other hand, very restrictive building codes that do not support experimentation with and adoption of alternative materials and construction systems. Generally, in Africa, there is absence of policies that encourage the collection and separation of construction and demolition waste, for instance requiring separation at source. As a result, most African countries allow the disposal of all waste - including construction and demolition waste - in landfill sites. Even countries which have a Waste Management Act in place, do not tend to include provisions on construction and demolition waste (e.g., Botswana).⁹⁶ Likewise, acceptance and certification of alternative materials is still an issue and a blockage to the use of innovative, sustainable materials. National building standards tend to dis-incentivise or simply not allow the use of recycled, second-hand, circular building materials (such as Interlocking Stabilised Soil Blocks) for safety purposes. These innovative materials are neither included in material specifications and standards. This prevents the reuse of safe, high-quality second-hand materials in new buildings and constructions.

There is therefore a need for enabling policy environments for the adoption of sustainable building practices. The EU can help African countries design policies by providing inspiration on the possibilities of second-hand materials, sharing best practices and helping develop quality standards for these

⁹³ Republic of South Africa (2019) [National Waste Management Strategy. 2019 Revised and Updated National Waste Management Strategy](#)

⁹⁴ Aboginije, A., Segun, S. et al (2020) [Determining the Impact of Construction and Demolition Waste Reduction practices on Green Building Projects in Gauteng Province, South Africa. Proceedings of the International Conference on Industrial Engineering and Operations Management Dubai, UAE, March 10-12, 2020](#)

⁹⁵ Sweepnet (2014) [Rapport sur la gestion des déchets solides au MAROC](#)

⁹⁶ According to the interview with construction related stakeholders in Botswana on 3/11/2020.

materials (through the construction 2020 working group, through the EU Construction & Demolition Waste Management Protocol). National construction authorities or bodies could be the facilitator of these intellectual exchanges where existing national platforms (e.g., Green Building Councils in Africa) need to be leveraged, notably when discussing certification and rating issues. Policy needs to be developed from the bottom up, with the involvement of practitioners on the ground (including property developers and investors) as well as the informal sector who are typically not involved in policymaking.⁹⁷ This is to avoid developing policy that contractors are not ready for. African governments and building standards need to acknowledge the use of innovative circular construction materials - including the use of secondary raw materials – as an accepted and suitable construction material. In practice this would imply for re-use and for recycled materials to be included in material specifications and to be more widely adopted in governmental housing and development projects. Further, compliance with a mandatory share of recycled materials could be required in new construction and/or refurbishment projects.

The use of innovative circular construction materials and approaches

Innovative circular building materials have an important role to play in tackling the challenge of increasing need for (affordable) housing and construction overall. Besides regulatory acceptance, other challenges posed by the (rapid) uptake of these materials would be the ease of access to secondary materials as well as the costs of production capacity for these (for example, the machines required to manufacture ISSBs tend to be relatively costly).

There is therefore a need to map value chains and arrange key infrastructure and support to encourage both collection and use of the materials. National authorities need to arrange drop-off sites for construction, develop waste sorting facilities to cater for informal waste collectors, and engage with buy-back centres to include construction waste for re-use. The EU could then help establish (virtual) marketplaces for second-hand construction components (**R3 - Re-use**) and materials (**R8 - Recycle**) with enough volume and quality related data, to facilitate uptake of these products in the sector. Next to that, the long African tradition of building with soil and other local, natural materials offers opportunities (**R1 - Rethink**). For instance, the large stock of timber grown in some African countries as well as wood waste where forests are nearby can provide a rapidly renewable, low carbon source of construction material selection (e.g. hemp, bamboo, eucalyptus and pine).⁹⁸ To foster this a framework for exchange and networking should be created between African countries and European associations, professional bodies, EU-funded projects which are promoting construction with local, low-cost and natural building materials and techniques such as recycled plastic bricks, recycled concrete or mud (e.g. Asso Lesa, AsTerre and CRATerre in France; Citta dela terra cruda in Italy). This is also an opportunity to promote European companies' / organisations' (e.g., Saint-Gobain, the EU-funded public agency Euromediterrané) expertise and innovations with regards to eco-materials and solutions and to showcase expertise and learnings of European programs in terms of re-using material for construction (e.g., in France the national program Recybeton⁹⁹). Support to African SMEs through cheap loans or via the development of leasing models for ISSB manufacturing equipment are avenues where the EU could also support deployment.

Lack of knowledge and skills

Everywhere around Africa there is lack of knowledge concerning the application of specific circular economy approaches. These approaches and knowledge may refer to waste minimisation and recycling,

⁹⁷ According to the interview with construction related stakeholders in Botswana on 3/11/2020.

⁹⁸ According to the interview with ACEN country representative in Cameroon on 11/11/2020.

⁹⁹ [Recybeton](#) (n.d.)

the use / manufacturing of circular building materials (including utilisation of secondary materials), use / manufacturing / maintenance of machines, reuse / recycling of materials from end-of-life buildings, circular design considerations and the development of new circular business models (including the switch from selling construction materials to providing construction services). This knowledge is essential to meet the needs for affordable green housing, to be able to establish green manufacturing spaces (Eco-Industrial Parks) in Africa that are in the planning (e.g., Kigali, in Rwanda), as well as to “green” ‘regular’ industrial parks (e.g., the Diamniadio industrial park in Senegal). However, there is no evidence that construction Vocational Education and Training is available in African countries.

To bridge the current knowledge gap, (young) construction workers and craftsmen need to be provided with training in the use and development of local and environment-friendly construction materials, the working of new technologies, manufacturing processes and materials, as well as maintenance required for machines. Engagement in circular economy-related technical cooperation and research is needed from both public and private institutions affiliated with the construction industry. This should include national construction authorities, building societies, universities, construction research centres and institutes of technology, and construction companies. Training courses should involve relevant local partners such as associations of manufacturers. In addition, cooperation with European knowledge institutions and EU construction-oriented companies is key to address the aforementioned knowledge gaps in the African construction sector and knowledge institutions, discuss issues such as quality of secondary construction materials, and facilitate transfer of technology (e.g., lumbering technology which can optimise the use of timber especially by avoiding wastage while sawing). Small-scale and informal enterprises could benefit from skills upgrades through knowledge exchange programs and partnerships with successful manufacturing firms from Europe that are already active in the areas of circular building practices (e.g., Stonecycling in Kenya¹⁸⁰). EU CE Missions could be suitable events to establish such cooperation activities.

Lack of awareness

Local materials and techniques that have been used for centuries, are now being used less and less or even disappearing. There is a challenge to change the perception on local materials and techniques which are considered old-fashioned and not as robust as modern materials. Circular (or sustainable) construction is generally not a priority issue in Africa (where other pressing issues are higher up on the agenda). In light of this, showcasing cost-savings and cost-efficiencies of the CE is seen as key in the transition from conventional construction largely with cement.

There is a need to raise awareness on the economic, social and environmental benefits of using local, natural, eco-friendly materials, highlighting in particular the end-of-life / demolition implications of cement compared to these. Awareness raising needs to be done throughout the whole spectrum of society, from authorities to building professionals, to project developers, to knowledge institutes / academia (architecture and engineering schools) to the general public. Awareness raising can be done through the organisation of or participation to events targeting those specific public. The EU could support African policy makers in the process to include in the regulatory framework the use of environmentally friendly materials that enable a circular economy approach. Examples can be taken from EU member States such as France, with a percentage of bio-based materials in new construction and renovation. EU e-learning platforms which are freely available can also be further promoted (e.g., “Mooc Batiment durable” supported by ADEME in France¹⁰⁰). The EU could also provide advocacy support to local

¹⁰⁰ Mooc Batiment Durable (n.d)

private actors (especially start-ups and SMEs), through involvement in the policy dialogues to facilitate the delivery of messages to ministries, structured consultation and a stronger involvement in policy dialogues related to construction and demolition waste.

Electronics and ICT

Africa has some of the fastest demographically growing countries in the world, but at the same time some of the poorest economies. However, the use and demand of ICT and electronics is growing as they are closely linked to economic development and the improvement of living standards¹⁰¹. On the one hand, compared to other continents, Africa's use of Electrical and Electronic Equipment (EEE) and ICT equipment is still relatively low (the per capita use varies between 4.6 kg in Liberia and 44 kg in Nigeria¹⁰²), but on the other hand, the penetration rate of personal computers has increased from 5% in 2010 to 11% in 2019¹⁰³, while the number of mobile phone subscribers is above 100% penetration¹⁰⁴. The continent also leads the world in mobile banking¹⁰⁵. Many African countries already embrace these sectors, as they recognise their enabling roles in leapfrogging the linear economy while improving socio-economic aspects. Nevertheless, increased consumption correlates to higher waste generation which is combined with a significant share of unusable EEE imports, that needs to be solved.

In 2019, approximately 2.9 million tons of e-waste were generated in Africa (excluding imports of externally generated e-waste) which equals to 2.5 kg per capita with Egypt, South Africa and Algeria as largest contributors. Of the global generated 53.6 Mt of e-waste, Africa ranks second-last. However, with growing economies and average disposable incomes, the overall quantity of e-waste generated in Africa is expected to increase.¹⁰⁶

50-85% of the total e-waste is produced in Africa, the remaining part origins from illegal and contrabanded transboundary imports from developed/high-income countries such as the United States, Europe or China. This is mostly due to looser environmental laws, occupational safety and health regulation as well as governance and monitoring. For instance, Nigeria and Ghana, being well accessible through ship transport on the West African coast, have relatively high imports of "used electrical and electrical equipment (EEE)". Of this EEE, at least 19% are not functional anymore, equalling the state of waste¹⁰⁷. This has led to the development of an entire new economic sector around reuse, repairing and recycling resources (R-strategies 3,4 and 8), where **reuse is prioritised purely due to economic gains**. Trading and recovering the WEEE materials has become an income-generating opportunity, which is driven by the demand for second-hand electronic products and secondary materials. Nigeria and Ghana have efficient and well-organised repair and refurbishment networks that focus on used equipment from domestic supplies and imports.¹⁰⁸ In both Accra (Ghana) and Lagos (Nigeria), the refurbishing sector generates income for more than 30,000 people. Alaba International Market in Lagos (the largest market for used and new electric and electronic goods in Africa), holds 6,000 repair and sale businesses, and provides jobs to 21,600 people.¹⁰⁹ At the computer village in Lagos (the hub of second-hand EEE in Nigeria), approximately half of all 3,500 registered businesses involved in sales and repair of PCs, phones, peripherals and software, are involved in refurbishment (R-strategy 5) and repair of imported IT equipment and parts.¹¹⁰

¹⁰¹ ITU (2020) [The Global E-waste Monitor 2020](#)

¹⁰² Schlupe, M. et al. (2012) [Where are WEEE in Africa?](#)

¹⁰³ Statista (2020) [Share of households in Africa with a computer at home from 2005 to 2019](#)

¹⁰⁴ Ponelis, S. and Holmner, M. (2015) [ICT in Africa: Enabling a Better Life for All](#)

¹⁰⁵ Ponelis, S. and Holmner, M. (2015) [ICT in Africa: Enabling a Better Life for All](#)

¹⁰⁶ ITU (2020) [The Global E-waste Monitor 2020](#)

¹⁰⁷ *Ibid*

¹⁰⁸ EPA (2013) [Re-evaluate re-use of Electrical and Electronic Equipment \(Evaluation and Mainstreaming\)](#)

¹⁰⁹ *Ibid*

¹¹⁰ Osibanja, O., Nnorom, I. C. (2018) [The Challenge of Electronic Waste \(E-waste\) Management in Developing Countries](#)

The digital sharing economy – one of the schools of thought of the circular economy – also holds large potential in Africa which has already been emerging for decades in an informal way. The key reason for this is that the sharing culture is a fundamental part of the African lifestyle. Thus, operating existing means through the digital sharing economy can help Africa to bridge service gaps created by inadequate resources and infrastructure while also enabling growth, attracting investment and employment (the sharing economy is largely dominated by workers aged at 18-34, which is also the age group largely affected by unemployment in Africa¹¹¹), and even thrive in periods of slow economic growth. The latter is particularly the case for peer to peer sharing platforms.¹¹² According to Dalberg the three most pressing needs that a digital sharing economy can contribute to address in developing countries are: youth unemployment / underemployment, access to finance, and agricultural productivity (see case study: Hello Tractor, Box 2-4)¹¹³. The main challenge now is to connect the sharing activities to tech-based platforms which offer the opportunity to formalise businesses which are necessary for long-term economic stability, reducing poverty and enabling social welfare.¹¹⁴

In terms of recycling the generated e-waste, only 0.9% are documented to be collected and properly recycled in Africa, which is the lowest global recycling rate¹¹⁵. The main reason for this low recycling rate is the lacking waste management and collection infrastructure. The majority of the waste is improperly disposed or treated which often includes burring or burning the waste in open sites. This way, toxic chemicals may enter the air and soil causing threats to local ecosystems and ultimately to human health. The informal sector dominates the collection and recycling of e-waste in most of the African countries. It usually handles the e-waste in backyards by manual stripping to remove electronic boards for resale or reuse, open burning of wires to recover materials such as copper, aluminium or iron, and the deposition of unusable components in open dumpsites.

This situation calls for legislation and standards regulating the import of used EEE for the purposes of dumping. As yet, 13 countries¹¹⁶ have an e-waste legislation or regulation in place. However, enforcement is often still very challenging. For instance, Ghana developed Technical Guidelines on Environmentally Sound E-waste Management for Collectors, Collection Centres, Transporters, Treatment Facilities and Final Disposal. Another example is the formation of the first E-waste Producer Responsibility Organisation (EPRON) in Nigeria¹¹⁷. Simultaneously, effective collection systems have to be established to cope with the increasing amounts of e-waste while ensuring it is treated in an environmentally and socially sound way. This especially demands directing private and public investments into waste facilities and infrastructure. The development of regional markets and recycling facilities will enable to build economies of scale that recover precious, critical and non-critical raw materials and re-export them so that they may re-enter the manufacturing process.¹¹⁸

Box 2-7 Case study: Supima Technologies, South Africa

Supima Technologies, South Africa (R4 - Repair)

¹¹¹ EMIA (2017) Sharing economy: [Africa finds its share in the market](#)

¹¹² Tearfund (2017) Sharing economy - [Benefits and barriers to the sharing economy in low-income countries](#)

¹¹³ Dalberg (2016) [Digital sharing for global growth: Sharing resources, building economies.](#)
[Dalberg Global Development Advisers](#)

¹¹⁴ Tearfund (2017) Sharing economy - [Benefits and barriers to the sharing economy in low-income countries](#)

¹¹⁵ ITU (2020) [The Global E-waste Monitor 2020](#)

¹¹⁶ These 13 countries are: Ivory Coast, Ghana, Nigeria, Cameroon, Equatorial Guinea and Sao Tome and Principe, South Africa, Zambia, Tanzania, Madagascar, Uganda, Rwanda, Kenya and Egypt.

¹¹⁷ ITU (2020) [The Global E-waste Monitor 2020](#)

¹¹⁸ UNEP (2018) [Africa Waste Management Outlook](#)

Supima Technologies is an IT company based in Johannesburg offering different services. Besides IT support or IT solutions, one of their main activity is IT repair. Their team of technicians especially focus on the servicing, repairs and upgrades of out-of-warranty IT equipment. This includes laptops, printers, PCs and uninterruptible power systems (UPS).

Source: *Supima Technologies (2018) IT Repairs*
Box 2-8 Case study: East African e-waste recycling hub

E-waste recycling hub, East Africa (R8 - Recycling)

In 2014, the East African Compliant Recycling Centre was founded in Kenya, inter alia funded by the German Development Bank. It runs on the premise of processing e-waste collected by trained residents and selling it then back to companies throughout Kenya. The model offers collectors a fair and transparent price, effectively connecting individual collectors to global markets.

The structure of the hub requires a foundation of resident collectors who search for the e-waste, separating it from other forms of trash at dumps throughout the country. Collectors are formally trained collectors and informal e-waste pickers, drawn by the lucrative cash-in-hand process that takes place at the 40 collection points like Mukuru. After a day of work, the collectors are able to earn \$45 to \$60, that makes the task stands as one of the best jobs available in the country for residents used to living below the minimum wage.

The hub reflects a push for a common, harmonised East African approach to the global e-waste crisis. Neighbouring countries like Uganda may be able to replicate the Kenyan model, thus ensuring that shared environmental resources do not become contaminated with e-waste toxins despite positive efforts in one single country.

The E-Waste Solutions Alliance for Africa, a collaboration between Dell, HP, Nokia, Phillips and the Recycler Reclaimed Appliances (U.K.) Ltd, has assisted with the hub's structuring and goals – one of which is to create green jobs. The program aims to create one job per ton of e-waste collected and treated every month. All workers will be trained to ensure the safe and environmentally friendly handling of the stream of e-waste shipped into and created within Kenya's borders.

Source: *ERI (2014)*

Other initiatives that cover different approaches of recovering e-waste are Closing the Loop (Netherlands, Ghana, Kenya, Nigeria) and GreenABLE (South Africa). A preliminary report from a research project looking for circular bottom-up initiatives in Africa identified 7 initiatives in the E-waste domain.¹¹⁹

Plastics and packaging

The plastic and packaging consumption in Africa is highly driven by its increasing population and consumption patterns. Correlating to those trends, the consumption is expected to further grow in the next years. The main materials used in Africa's packaging market are paper and cardboard, plastic, metal and glass of which packaging products, such as plastic bottles, glass bottles, corrugated boxes, metal cans are produced. The **beverage industry** holds the largest market share in Africa's packaging market. Glass bottles and containers are becoming an increasingly preferred packaging option as these are reusable, fully recyclable and also offer an aesthetic value to the consumer.¹²⁰

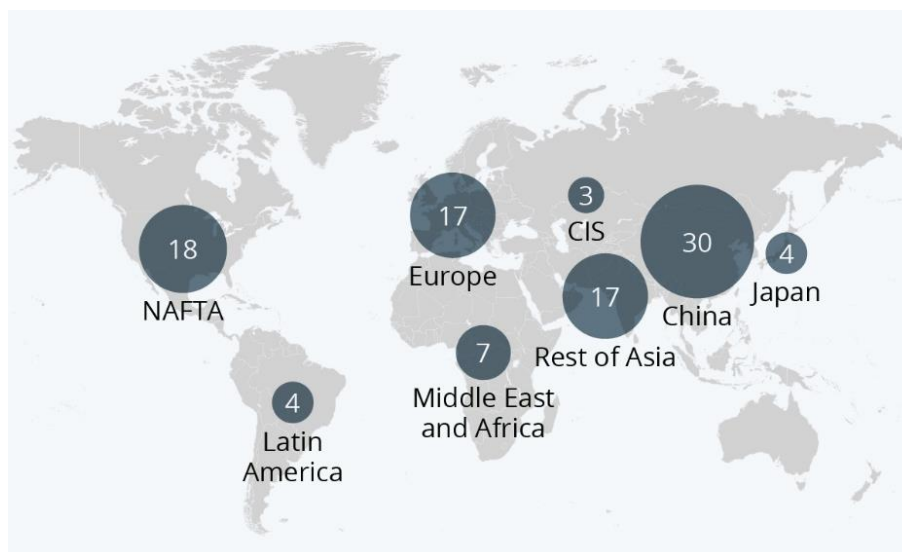
¹¹⁹ Circle Economy (2021) [The Circular Economy: Our journey in Africa so far](#)

¹²⁰ Mordor Intelligence (2020) [Africa Packaging Market \(2020-2025\)](#)

However, **plastic** still makes a significant share of the material used in the packaging industry. It has been used since the 1950s, long before proper recycling policies were in place¹²¹. The rise of plastic use in the plastic industry owes to increasing applications that rely on the characteristics that plastic offers, such as lightness, durability or low production costs. Literature also shows that the GDP has a strong impact on plastic consumption levels.¹²²

The primary production of plastic started in South Africa 50 years ago and is nowadays concentrated in a few countries, such as Algeria, Egypt, Morocco, Nigeria and South Africa. Their total production volume adds up to 15 Mt during 2009-2015¹²³ which is compared to other continents relatively low (Figure 2-7).

Figure 2-8 Global plastic production [%]



Source: Statista (2020) [Asia produces half the plastic in the world](#)

The per capita **plastic consumption** in Africa was in 2015 16 kg¹²⁴ while the estimated total plastic consumption amounts to 19.5 Mt¹²⁵ in the same year. Due to insufficient waste management and disposal behaviour, the pollution through plastic entering the ecosystem, causing clogged water ways and sewage systems or marine plastic litter, represents a threat to the environment and society. Egypt, Nigeria, South Africa, Algeria, and Morocco are estimated to be among the top 20 countries around the world contributing with their high plastic consumption to marine debris each year¹²⁶.

Based on a study analysing the plastic use in Africa, the estimated total **plastic waste** generated, between 1990-2017, amounts to 82.4 Mt.¹²⁷ The most common practice to deal with plastic waste is open burning at landfills. Another study estimated that in 2010 alone, 4.4 Mt of plastic waste are **mismanaged**. The study also forecasts that this could be as high as 10.5 Mt in 2025, following the business-as-usual

¹²¹ Jambeck *et al.* (2018) [Challenges and emerging solutions to the land-based plastic waste issue in Africa](#)

¹²² Babayemi *et al.* (2019) Ensuring sustainability in plastic use in Africa: consumption, waste generation, and projections.

¹²³ Babayemi *et al.* (2019) Ensuring sustainability in plastic use in Africa: consumption, waste generation, and projections

¹²⁴ Statista (2018) [Per capita consumption of plastic materials worldwide in 2015 by region](#)

¹²⁵ Babayemi *et al.* (2019) Ensuring sustainability in plastic use in Africa: consumption, waste generation, and projections

¹²⁶ Jambeck, *et al.* (2018) [Challenges and emerging solutions to the land-based plastic waste issue in Africa](#)

¹²⁷ Babayemi *et al.* (2019) Ensuring sustainability in plastic use in Africa: consumption, waste generation, and projections

scenario.¹²⁸ Based on this, the next decade (2020-2030) could witness about 164.7 Mt of plastics reaching their end-of-life if nothing changes to reduce the mismanagement of plastic waste.

The share of **plastic recycling** in Africa is rather small – plastic waste is disposed of with MSW and has a recycling rate of approximately 10%.¹²⁹ Yet, the recycling industry has mainly focused on commodity plastics and first-level processing, such as baling and shredding. The processed plastic is then sold and exported to Asia, where it is usually downcycled to products, such as pillow stuffing. Although this extends the lifetime of materials, this procedure includes additional transport abroad and only creates downcycled products that can no longer be recycled.¹³⁰

In many African countries, increasing plastic pollution has motivated the private sector and/or policymakers to fight plastic pollution. For instance, in Kenya, the initiative solely came from the private sector, namely the Association of Manufacturers, to develop the Kenya Plastic Action Plan¹³¹. Another example is Rwanda, where strict legislation was enacted to protect the environment from further contamination – currently, Africa has the highest percentage of countries (~46%) with plastic bans. Their implementation, however, is still lacking.¹³² In 2008, Rwanda took the global lead in banning nonbiodegradable (single-use) polyethylene bags, prohibiting the manufacturing, use, import, and sale of nonbiodegradable bags (**R-strategy 0 - Refuse**). It came along with strict enforcement measures and legal consequences, like high fines or imprisonment, when violating the law. In 2019, this law was extended to all types of shopping plastic bags and single-use plastic items (where alternatives exist, or which can be avoided). The law also includes tax incentives that motivates plastic bag manufacturers to consider recycling as a business opportunity. The policy has led to local production of sustainable bags made from local materials, created jobs, increased foreign direct investment and brought the reputation of being the cleanest country in Africa.¹³³

Large corporations also play a role in tackling the plastic challenge by, for instance, developing new technologies or materials that enable to re-integrate recycled plastic and packaging materials into the product cycle (**R-strategy 8**). In April 2019, Amcor launched unique, recyclable, high-barrier flexible packaging that reduces a pack's carbon footprint by up to 64%. Another example comes from Nairobi where Nairobi Bottlers (a subsidiary of Coca-Cola Beverage Africa) has launched new packaging for its water brand Dasani Water, by removing the sleeve on the cap (**R-strategy 1 - Rethink**).¹³⁴

There are also many bottom-up initiatives emerging. These reach from partnerships between recyclers and local waste points to small enterprises that upcycle plastic waste materials found on the street or water ways. One case study representing an example for the latter, is featured in the box below. Another small company that has found an innovative solution to address the problem of plastic litter is Coliba in Côte d'Ivoire. This is a mobile phone company that provides its users with SMS and mobile data credits and other rewards when they collect plastics which is registered via Coliba's mobile app.¹³⁵ By June 2019, Coliba had already processed 300 tonnes of plastic waste.

¹²⁸ Jambeck *et al.* (2018) [Challenges and emerging solutions to the land-based plastic waste issue in Africa](#)

¹²⁹ Babayemi *et al.* (2019) Ensuring sustainability in plastic use in Africa: consumption, waste generation, and projections

¹³⁰ Adebisi-Abiola *et al.* (2019) [Cleaning up plastic pollution in Africa](#)

¹³¹ Kenya Association of Manufacturers (2019) [Kenya Plastic Action Plan - Accelerating a Circular Economy in Kenya](#)

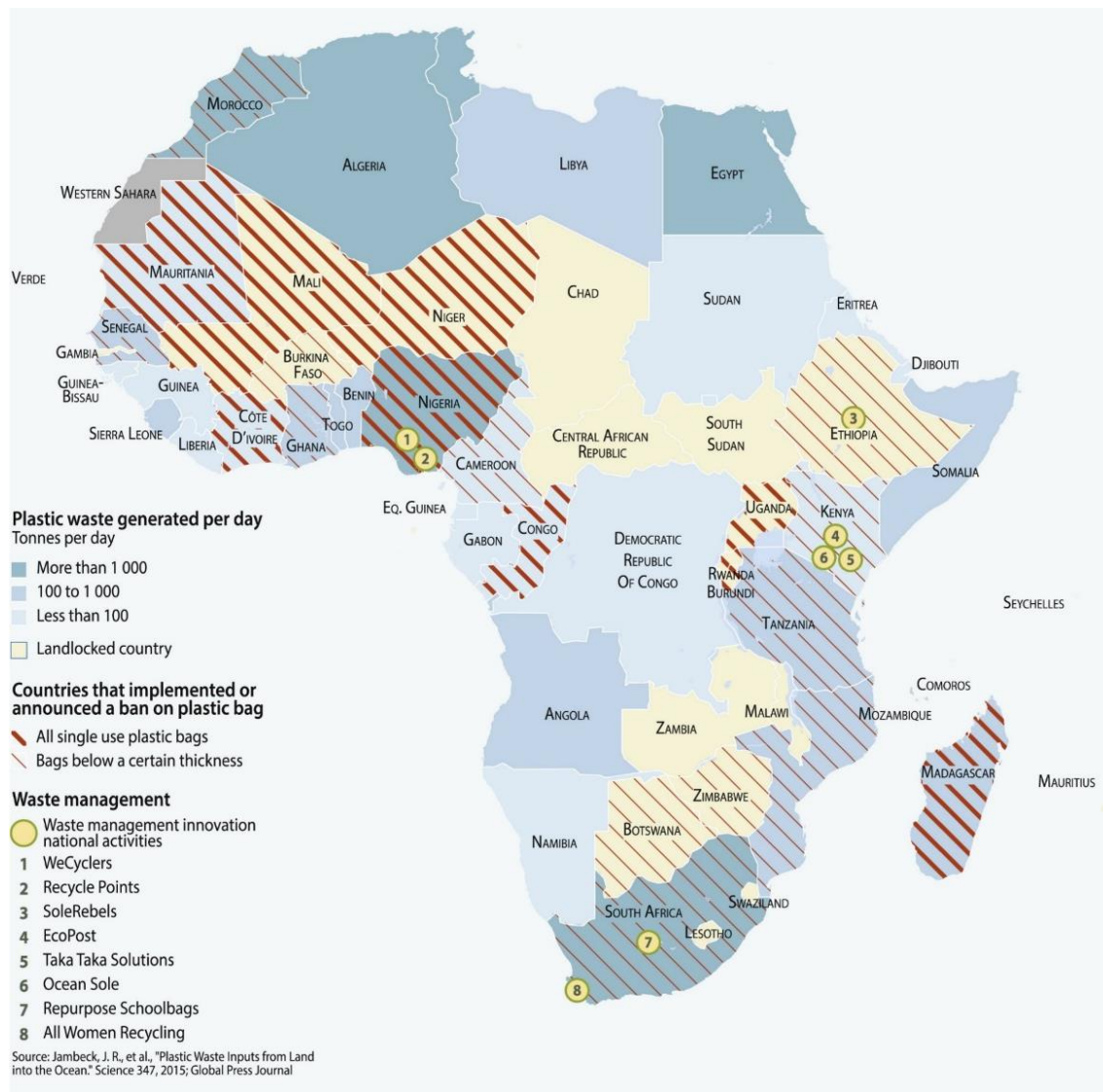
¹³² Adebisi-Abiola *et al.* (2019) [Cleaning up plastic pollution in Africa](#)

¹³³ According to an interview held with Israel Dufatanye, inspector at REMA, on the 15/12/20.

¹³⁴ Mordor Intelligence (2020) [Africa Packaging Market \(2020-2025\)](#)

¹³⁵ GSMA (2019) [Coliba - Using mobile to create a formalised plastic recycling economy in Africa](#)

Figure 2-9 Africa map: plastic waste generation, management and policies



Source: Jambeck et al. (2018 *Challenges and emerging solutions to the land-based plastic waste issue in Africa*)

Box 2-9 Case study: Mckingtorch Africa, Ghana

Mckingtorch Africa, Ghana

Mckingtorch Africa is a social enterprise recycling and upcycling plastic waste into valuable products. The business currently employs three people and engages over 200 volunteers in Ghana and beyond, exporting to 7 countries which include Germany, France and the Netherlands. Examples of their upcycled products are sandals, rubbish bins, wall artworks, flowerpots, laundry baskets or bracelets. In addition to their upcycling activities, they also engage in advocacy on environmental sanitation and plastic pollution, community and beach clean ups as well as youth training and mentoring on developing solutions to tackle the plastic challenge.

Source: *Mckingtorch* (2020)

Textiles and apparel

Even though clothing manufacturing activities in Africa are rather limited, several parts of the textiles value chain play an important economic role in the continent, although some practices come with important trade-offs.

Production of raw materials for textiles: Africa's cotton sector

In Africa, activities in the textiles and clothing industry mainly include cotton farming, but also fibre manufacturing, dyeing, printing and bleaching. Cotton production has been a large part of some African countries - in fact, it has been grown south of the Sahara since at least 3000 BCE. The cotton is woven into clothes and sold around the world. Cotton agriculture and production is found in Benin, Burkina Faso, Chad, Côte d'Ivoire, Mali and Senegal, and represents a key export in all of them. Some East African countries have important cotton sectors, such as Tanzania, Uganda or Kenya. In the South, cotton has been important in the economies of Angola, Mozambique and Zimbabwe as well as Zambia. As the international demand for cotton is growing while some markets are contracting (like tobacco in Malawi), the production of cotton in Africa is expected to further grow. The cotton and textiles production holds many potentials for several African countries that might contribute to solving prevailing challenges, i.e., poverty, unemployment and general economic development. However, while increasing cotton production, it is important first, to consider that this practice is relatively resource intense and second, to ensure that the space required for cotton farming does not compete with food crops.

Textiles manufacturing

Despite the presence of a large African cotton sector, most of the locally produced cotton textiles are exported to the global North as these products are more expensive than the textiles produced by Asian textile manufacturers which produce textiles on a more industrial scale. Still, low labour costs attract international fashion brands to produce their goods in Africa. Ironically, these products might only become accessible when coming back as second-hand imports.¹³⁶ Consequently, supplying the local market highly depends on cheap and thus low-quality clothing imports from China (with an approximate import value of € 2 bn) and other countries (mainly in Southeast Asia).

Another flow of products entering the African clothing market, which has gained increasing attention within the last years and has been discussed as a controversial issue, are second-hand textiles imports. An activity started out of goodwill and charity wanting to provide clothing to the poor, has put some countries (e.g., Ghana and Nigeria) at risk of becoming the dumping grounds of Western post-consumer textiles. Depending on their location (proximity to shipping infrastructure), some countries are more prone than others. For instance, before the Tanzanian government raised taxes on textile imports, approximately 40,000 tons of used clothing arrived in the country every month.¹³⁷

This development has led to an outpaced and fading textile industry. While in the early 90s, Kenya was home to 110 large clothing factories, their number reduced to 15 today.¹³⁸ While there is no immediate solution, the most common political response is a ban or taxation of second-hand imports, such as done by countries from the East African Community (see section 2.1). Other countries, such as South Africa, imposed partial bans, i.e., on those products that the domestic market also supplies in order to avoid weakening their local production. Hence, products which are not well-represented on the local market

¹³⁶ Textile Network (2019) [Situation report: Africa](#)

¹³⁷ *Ibid*

¹³⁸ *Ibid*

are allowed to be imported as second-hand.¹³⁹ On the one hand, if well-enforced, bans are effective means to protect the local market. However, if the local production is not stimulated at the same time (e.g., through subsidies), making the products more affordable for the locals, it is doomed to decline. On the other hand, imported second-hand clothes have become an important part of African markets and trade. This especially applies for Sub-Saharan countries, including Kenya, Malawi, Mozambique, Nigeria, Rwanda, Senegal, Swaziland, Tanzania, Zambia and Zimbabwe. In Uganda, 81 per cent of clothes bought are used clothes. Another important, related aspect is that the trade, re-distribution and re-selling of second-hand clothes generates income and millions of jobs, dominantly in the informal sector. Therefore, this conflict between different interests, related to second-hand trade in Africa, must be linked to a discussion on industrial decline and clothing culture.¹⁴⁰

Opportunities and trends

As Africa gains more attention on the international textile market, the continent is ready to move away from only exporting its products and relying on imports of cheap clothing from Asia and second-hand clothes. Instead, it has the potential to take over the complete production process and export of finished textile products¹⁴¹. This, however, demands a rapid industrialisation and capacity building as production processes will have to be advanced to ensure higher levels of production complexity, efficiency and quality that can compete on the global market. This in turn would create many formal jobs and provide the opportunity to integrate circular principles from the very beginning. The **right skills** are of special importance as they determine the final outcome. The focus should lay on transferable skills focussing on technology and reuse. The challenge here is how to merge the strong ‘*make do*’ ethos (use what you have) with emerging facilitating technology to accelerate the development.¹⁴²

Simultaneously, it is essential to establish an infrastructure and political system that enables and facilitates the circulation of the products and materials. This would, for instance, include a separate collection and sorting of textile waste which can be reused or must be recycled. The integration of more transparency into the value chain, thereby supporting labelling/certification processes. Examples of global textile labels are *Fairtrade* or *Global Organic Textile Standard*. Informing the recycling process can also be of significant value. Setting up transparent and credible systems for the tracking and monitoring of the sustainability of textiles production processes in environmental as well as social terms, can also bring increased economic value, as such products can then be sold as sustainable products at an increased price. This, however, requires global effort as the textiles value chain is one of the most complex and globally interconnected ones. Besides supporting in capacity building, the EU could take a strong stand in advocating it.

Even though transforming the textiles value chain in Africa entirely to a more sustainable model will require a global effort, there are already several promising grass-roots initiatives emerging. There are initiatives relating to the use of meat and fish waste to produce leather products, business models to recycle textiles as input for fibre production, but also apps for short-term rental of clothing. Examples of circular initiatives in Africa’s textiles industry are introduced in Box 2-11 below.

¹³⁹ According to the interview with Jade Wilting (Circle Economy) on the 11/02/21.

¹⁴⁰ Andrew Brooks (2015) [Clothing Poverty: The Hidden World of Fast Fashion and Second-hand Clothes](#)

¹⁴¹ AfDB (2018) [Textile and Clothing industries can drive Africa’s industrialisation, benefit women](#)

¹⁴² According to the interview with Jade Wilting (Circle Economy) on the 11/02/21.

Box 2-10 Case studies: CE grass-root initiatives in Africa**Rewoven - A South African start-up that creates fabrics from 100% recycled material (R8 - Recycling)**

The South African start-up Rewoven was founded in 2018 by three young innovators who wanted to make a positive create a positive social and environmental impact by setting up a company for textiles recycling.¹⁴³ At the moment the company has two main product lines. It sells leftover fabrics from large scale manufacturers to small-scale producers to divert these leftover textiles from landfill. Next to this, the produces textiles from a mix of recycled cotton and recycled plastic waste. The cotton is sourced from the off-cut remainders from the manufacturing of clothing. In the future, the company also aims to develop recycling processes for non-cotton fibre types.¹⁴⁴

Atelier Le Printemps - Algerian start-up creating new textile products from discarded textiles (R6 - Remanufacture)

In Algeria, the small company Atelier 'Le Printemps' produces different kinds of textile products such as dolls, duvets, tablecloths and bags from discarded clothes and fabrics.¹⁴⁵ The items are sold at bargain prices in local markets. The start-up received government support in the form of a micro-loan as well as financial support from the international programme SwitchMed.¹⁴⁶

Leather products from waste streams - Two stories from Kenya (R7 - Repurpose)

Kenyan fishermen discovered a valuable application for the use of fish skins, which are now used for the production of sandals, shoes, wallets, handbags and much more.¹⁴⁷ Nowadays, this company employs 17 permanent staff members. Even though the usage of the fish skins started because large parts of the fish were discarded as waste, the fish processors have now adapted their fileting techniques to preserve the skins in the best way possible.¹⁴⁸ Some products were displayed at the Blue Economy Conference in Nairobi in 2018 (see picture below).



Source: [FAO \(2021\) Blue Economy Growth Blog](#)

The Kenyan company Kyuma Goods produces leather products from third grade hides discarded in slaughterhouses.¹⁴⁹ The founder of the company developed natural tanning products and procedures to replace the conventional process based on chemicals. The company also trains local communities how they can collect and

¹⁴³ [Rewoven](#) (n.d.)

¹⁴⁴ Hertantyo (2019) [Meet the trio who weaves fashion waste into fashion fabric](#)

¹⁴⁵ Smith (2019) [Algerian start-up recycles discarded fabrics to create useable items](#). Arab news/ business & economy.

¹⁴⁶ Switchmed (2018) [The pilot project "Atelier printemps" has become a green economic model to duplicate in Algeria](#)

¹⁴⁷ FoundersAfrica (2017) [Turning Fish to Shoes: This Kenya-based startup is converting fish waste to leather products](#)

¹⁴⁸ FAO (2018) [BlueFashion: From Lake Turkana to the runway](#)

¹⁴⁹ Footprints Africa (2020) [The Circular Economy: Our journey in Africa so far](#)

preserve “waste hides” from cattle which are subsequently used by Kyuma goods to produce several kinds of leather products, including sandals, bags and wallets.

La Reina - Renting of used and new clothing in Egypt (R1 - Rethink; R2 - Reduce)

The Egyptian start-up La Reina rents out (used) clothing for a week after which it is returned to the company cleaned and rented out to other users.¹⁵⁰ In the meantime, the business has over 100 000 users and has received multiple rounds of capital investments. Even though the company started with renting out exclusive dresses, thereby making expensive dresses accessible for a wider public, it is now trying to change the way in which people clothe themselves on a day-to-day basis by offering clients a box with different clothing items every week.

Waste sector

Africa will undergo a major social and economic transformation as its population grows rapidly –two billion people are expected to live on the continent by 2035– cities urbanise in a similar pace and consumer habits change together with an expanding middle class. These factors will significantly drive up Africa’s waste generation.

It is crucial to shape Africa’s transformation into one that will lead to a system that reverts local and global challenges, including increasing the life quality, ensuring health standards for workers, waste pickers and local communities, protecting the natural habitat and biodiversity or providing jobs to leverage the high (youth) unemployment rates.

In 2015, Africa’s total municipal solid waste (MSW) generation amounted to 124 million tons, which is expected to more than double in 2035 (309 million tons). Especially, the Sub-Saharan countries will become the dominant contributors to global waste generation, with South Africa and Nigeria leading this trend. For that, Northern African countries have a relatively higher per capita waste generation. Averagely, the per capita waste generation in Africa was 0.78 kg per day in 2012 varying from 0.09 kg per days for Ghana and 2.98 kg per day for Seychelles. In terms of collection rates, the average continental MSW collection rate is at 55%, in Sub-Saharan countries, it is less than 44%.¹⁵¹

The amount of waste generated and collected strongly varies between countries and regions as well as different types and scales of settlements. For instance, in rural areas, it is assumed that waste generation is much lower due to lower consumption levels, lower purchasing power and higher re-use patterns. For reversed reasons, Northern African countries have higher waste generation rates. Regarding collection rates, rural and poor urban areas often have lower collection rates as they have only limited access to or no existing waste collection system in place.¹⁵² In terms of data availability, most data exist for urban areas where recycling activities are increasing and perceived as economic opportunity. This is certainly not fully representative for a country and its waste management activities. In rural areas, simply out of necessity due to lacking infrastructure and lower economic standards, more favourable R-strategies¹⁵³ like reuse or repurposing, are applied more often than in urban areas. However, **recycling is the only R-strategy on which enough data exist to be included in this study**. Even though recycling is the second-least prioritised activity in the R-strategies hierarchy (R-strategy 8 - *recycling*) and the middle option in the waste hierarchy, it takes a central part in Africa’s waste management and will become more important especially in terms of trade of secondary materials.

¹⁵⁰ Paracha (2020) [Cairo-based La Reina raises six-figure investment, launches a fashion subscription service ‘The Box’ for women](#)

¹⁵¹ UNEP (2018) [Africa Waste Management Outlook](#)

¹⁵² Niekerk and Wegmann (2019) [Municipal Solid Waste Management in Africa and Arab Countries](#)

¹⁵³ Amongst others, the 5 main R-strategies are refuse, reduce, reuse, repurpose and recycle.

The average waste composition of Sub-Saharan Africa is made of 57% organic waste, 13% plastic, 9% paper or cardboard, 4% glass, 4% metal and 13% of other materials. This composition differs from high-income countries in two main ways: first, the share of organic content is double compared to the share for high-income countries and second, the second-largest waste stream is plastic instead of paper. Such differentiating characteristics to other economies stress the **importance of developing solutions that consider the African context instead of integrating waste management solutions that are successful in developed economies without adapting them properly.**

Of the MSW generated approximately 70-80% is recyclable. However, only 4% in average is currently recycled which is commonly done by waste recycling businesses supported by a large and active informal sector (including itinerant buyers and waste pickers). These low rates of collection and recycling are due to a lack of service infrastructure which is not able not meet supply.

Common waste management practices and their impacts

Collection

The extent and model of waste collection depends on the setting being urban or rural, poor or wealthy. Slums and rural areas usually have limited to non-existent waste collection services in place whereas urban and high-income areas have higher collection rates. In towns and cities, the most common practice to collect MSW is door-to-door waste collection which is often capital-intense and carried out by MSMEs. In rural or low-income areas, communal collection and block collection with manual equipment is most common. Effective waste collection systems are difficult to implement, as houses are sparsely scattered over long distances and narrow, unpaved and sloping roads. Due to similar reasons than for the waste generation (lower consumption patterns and lower purchasing power) and less packaging material as well as higher rates of reuse of end-of-life products, it is assumed that the waste collection rate in rural areas is lower.¹⁵⁴

Recycling

The treatment of the 4% of waste that is officially recycled happens in a few on-site material recovery facilities, established by municipalities. However, most of the municipalities lack sufficient logistic for waste segregation and separate collection of recyclables. Due to the incomplete data available on recycling rates across African countries, it can only be preliminarily concluded that recycling rates vary by country depending on the recycling capacity, infrastructure, investments and the respective sector. For instance, South Africa has a relatively high recycling capacity for plastic (43%¹⁵⁵) while Rwanda obtains a proportionally high MSW recycling rate (10%¹⁵⁶).

The recycling sector is entirely market driven and has grown through the informal sector that collects recyclable material from kerbsides and landfills. In the meantime, micro-enterprises are involved as well. This has eased the establishment of local and international end-use markets that use these collected recyclates in the manufacturing of new products. These initiatives are still very few in number but are foreseen to multiply if the right regulatory means will be put in place.

¹⁵⁴ UNEP (2018) [Africa Waste Management Outlook](#)

¹⁵⁵ Linnenkoper (2019) [Latest recycling stats for South Africa](#). *Recycling International*

¹⁵⁶ Kabera & Nishimwe (2019) [Systems analysis of municipal solid waste management and recycling system in east Africa: benchmarking performance in Kigali city, Rwanda](#). E3S Web of Conferences 80, 03004 (2019). <https://doi.org/10.1051/e3sconf/20198003004>

Disposal

Uncontrolled and controlled dumping (with 47% and 29% respectively) as well as the open burning of waste (9%) are the most common waste disposal practices in Africa as they represent the easiest and cheapest way. In open dump sites, the waste is left untreated, unsegregated and uncovered which leads to ground water pollution and leachate recovery. However, African countries slowly upgrade their disposal infrastructure from open dumping to controlled landfilling and finally sanitary engineered landfilling. Uncontrolled dumping and open burning are especially common in rural areas that do not reuse or recycle their waste. This became very critical with increasing consumption of plastic or health care materials.

These waste disposal practices, as a result of inadequate collection, treatment and recycling infrastructures, may have the following social and environmental impacts:

- increased risks of diseases and flooding through indiscriminate dumping of waste in urban areas;
- contribution to the generation of global GHG causing climate change and leachate which can pollute ground and surface water through uncontrolled disposal of organic waste¹⁵⁷;
- significant air pollution through open burning of waste which impacts the health of workers (which are often children that are especially vulnerable) and generally local communities;
- in 2017, more than two thirds of the 130 plus people having been killed in recent landfill collapses in Africa were women. As yet, African waste management has ignored gender disparities.¹⁵⁸

Main challenges

There are three major cross-cutting challenges in the waste sector, that stood out most during the development of the country reports, are post-harvest food losses (explained in the previous section), the challenge with accumulating e-waste (under ICT & Electronics) and its improper treatment as well as the informal sector.

Informal sector

The informal sector is highly involved in the waste management which impedes accurate assumptions about collection and recycling rates. However, the sector's role in waste collection is as important as municipal and private waste contractors. For instance, in Nairobi, 500 tons per day are collected by the municipality, another 500 tons by the private sector and 300 tons by the informal sector¹⁵⁹. To this significant contribution to the waste economy from the informal sector also add an estimated \$ 20-50 million annually through the diversion waste from landfill. The informal sector also plays a role in recovering post-consumer recyclables, such as ferrous metals, paper, glass and plastic and supplying to recycling businesses. This way, the informal sector contributes to higher recycling rates, as they have been achieved in Egypt, Tanzania or South Africa.

¹⁵⁷ According to two case studies from Mozambique and Ivory Coast, the potential to upgrade open landfills to composting plants, anaerobic or semi-aerobic landfills is very high. This is due to the high organic share of African's average waste composition that releases CH₄, CO₂, and N₂O – all account as GHGs contributing to global warming and air pollution. The case studies prove a potential between 40-85% of GHG reduction, depending on the type of transformation. Yeo, D., Dongo, K. et al. (2020) [Material Flows and Greenhouse Gas Emissions Reduction Potential of ecentralized Composting in Sub-Saharan Africa: A Case Study in Tiassalé, Côte d'Ivoire](#) and Sarmiento dos Muchangos, L. and Tokai, A. (2020) [Greenhouse gas emission analysis of upgrading from an open dump to a semi-aerobic landfill in Mozambique - the case of Hulene dumpsite](#)

¹⁵⁸ UNEP (2018) [Africa Waste Management Outlook](#)

¹⁵⁹ *Ibid*

In a few cases, the informal sector operates with strong support of municipalities and producers, for instance in Morocco and Tunisia; in most of the cases, however, waste pickers are not appreciated by authorities and residents. This happens even though informal initiatives contribute to a vast extent to making the waste economy more circular through their contributions to recycling and recovery activities of especially MSW and e-waste.

An effective waste management system must integrate the informal sector into formal structures while also provide positive engagement and financial and operational support.

Box 2-11 Case study: Integration (formalisation) of informal waste sector in waste management, Attawafok cooperative, Morocco

Attawafok cooperative, Morocco (R8 - Recycling)

The Attawafok cooperative was developed in 2010. One year later it opened a waste recycling centre on-site of the Oum Azza landfill, including a platform for circulation and storage. With this centre, the cooperative wants to leverage the dangers and uncertainties associated with the activities of informal sorters as well as the desire to integrate an organised and formal framework. The cooperative as a legal status appears to be the most suited framework to the context and the need of these sorters because it combines democracy, social purpose and collective effort. It has the objective to sort the waste from surrounding areas, recycle sorted products, wash them, grind, press and – beyond the recovery of the materials – to improve the social conditions of sorters. The cooperative employs 150 workers, mainly former informal waste pickers, that work on-site. Before the workers start, they receive necessary working materials or trainings.

The cooperative provides an important environmental service at zero cost and social benefits to the community. It aims to inspire others around the country that still counts 220 unauthorised dumping sites. Yet, Morocco has already funded 16 waste sorting centres like Attawafok in partnership with other municipalities.

Source: Heinrich Boell Stiftung (2018) [Waste Management: Morocco, towards a success story?](#)

Legislation

The African Union (AU) has set an ambitious aspiration that “African cities will be recycling at least 50% of the waste they generated by 2030”. In order to achieve this, African countries and cities have to make further steps towards enforcing and incentivising the diversion of organic waste from landfills toward composting, higher value product recovery, refurbishment, repair, reuse and recycling of mainline recyclables such as plastic, paper, metal, glass, tyres and e-waste, and the diversion of organic waste from landfills to composting while also supporting regionality and regulating trafficking as well as illegal dumping¹⁶⁰.

The anticipated African CEAP may consider these elements while it could also include a regional strategy for secondary raw materials.

Most of the 54 African countries (47/54) have waste management and recycling legislations in place (chapter 2.1). Most of the legislations address at least managed and controlled disposal of waste like Algeria, while many also tackle treatment and recovery activities and targets. A few, such as Namibia, South Africa and Egypt, have developed a comprehensive integrated waste management.

¹⁶⁰ UNEP (2018) [Africa Waste Management Outlook](#)

Opportunities & trends

Across the 8 case study countries and additional research for broader Africa, the following opportunities and trends related to CE and waste have been identified:

1. Increased overall waste collection and recycling;
2. Formalise the informal workforce;
3. Reduced use of single-use plastics (already included in national legislation in several countries);
4. Avoid food losses;
5. Organic waste to fertiliser;
6. Increased recycling and refurbishment (R-strategy 8 and 6) of E-waste.

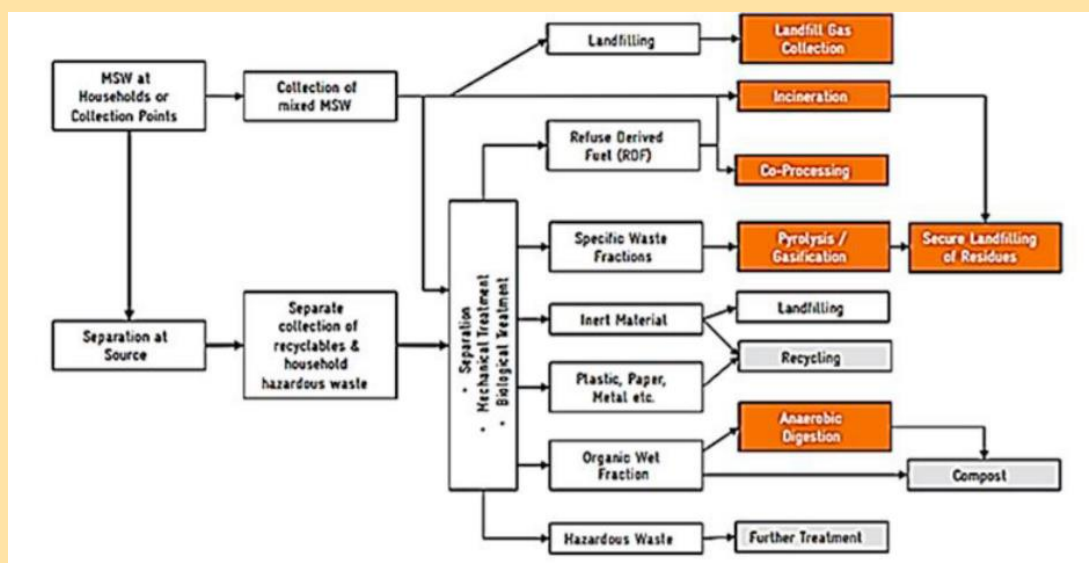
Box 2-12 Case study: Integrated waste management, South Africa

Pikitup, South Africa

Pikitup was founded in 2001 and is the official waste management service provider of Johannesburg, South Africa. It has the responsibility to collect and treat 1.4 Mt yearly of MSW and the waste of 17,000 businesses in the city. Pikitup also offers cleaning services to the city and its roads, but also to informal settlements using community and output-based contractors. In line with the local new Integrated Waste Management Policy and National Waste Management Strategy, Pikitup seeks to minimise the waste stream going to landfills (zero waste to landfills by 2022) while extracting the maximum value from the waste streams. The company employs 4,500 people and uses more than 200 trucks. Its strategic locations to store, dispose and treat the waste are:

- 11 waste management depots located throughout the city;
- 48 garden waste transfer sites available to the public to dispose of light garden waste. The utility provides containers for the organic matter at each of these sites. The waste is then transferred to a disposal site or taken to a composting site facility;
- Four landfills with 2 of them currently closed for rehabilitation, while additional private sites are also being used to dispose of waste at a fee;
- One incinerator. MSW is incinerated and gas is extracted from the procedure and converted to electrical energy. The GHG emitted during the energy generation is recycled which helps reducing GHG emitting into the atmosphere.

The available infrastructure from Pikitup is illustrated in the figure below.



Source: Rasmeni, Z. and Madyira, D. (2019) [A Review of the Current Municipal Solid Waste Management Practices in Johannesburg City Townships](#)

Box 2-13 List of initiatives tackling waste challenges in Africa

Mr Green, Kenya

Mr Green is a tech-enabled plastics recycling company in Kenya. It aims to disrupt the current informal and exploitative plastic recycling sector. The company offers an in-house end-to-end process for recycling, purchasing directly from their sourcing agents – waste pickers who are some of society’s most marginalised people. Mr Green owns and operates a series of trading hubs across Nairobi where they transact with their sourcing agents directly to purchase their collected plastic for onward transfer to their manufacturing plant. After the processing, the plastic is sold as post-consumer recycled plastic to plastic manufacturers and enables them to achieve, within their value chain, circular economy goals and benefit from raw material cost savings.

Ekotech, Kenya

Ekotech is a Kenyan waste collection company engaged in collection, transport and supply of waste for recycling purposes. The company collects various types of wastes from dump sites, hotels, restaurants, residential buildings, schools and shopping malls which they use to make eco-laminated boards, that are heat resistant, water resistant and termite resistant. Ekotech is the contracted waste recycler for Tetra Pak cartons in the East Africa region. The partnership is in tandem with Tetra Pak’s goal of recycling 40% of all leaving their factory.

Taka Taka Solutions, Kenya

Founded in 2011, Taka Taka solution is a company engaging in solid waste services and recycling industries in Nairobi. It recycles 95% of the waste that it collects, thereby reducing the amount of landfilled waste. The company currently has 200 employees on its two operation sites where it separates the collected waste into 45 different fractions before it sells them to local recyclers and converters. The company also makes composts out of their separated organic waste, which is sold to farmers. The company also plans to add recycling to its onsite activities in the near future in order to be less dependent on its partners.

Twiga Foods, Kenya

Twiga Foods, founded in 2014, is a fast-growing Kenyan enterprise using mobile technology & logistics to enhance food supply chains by consolidating more effectively and rapidly highly fragmented informal market supply and demand. By bridging gaps in food and market security through an organised platform. Twiga Foods contributes to reduce food losses and food prices as well as to establish an efficient, fair, transparent and formal marketplace. The company’s clients include both farmers, to whom it provides a guaranteed off take and small-scale vendors to whom it ensures distributed wholesale services. In the meantime, the company’s team consist of 1,000 employees.

Waste Marche, Egypt

Waste Marche is an Egypt based business that developed an online platform for industrial waste management to valorise the waste generated in industry. With its services it facilitates the handling of activities related to waste trading, technical advice, transporting and networking among stakeholders. On the platform, it provides access to a wide scope of buyers and service providers covering all categories of waste streams. For the buyers and recycling plants, it provides access to the primary sources of waste. In practice, manufacturing companies can post their waste items on the website and choose whether they want to sell and dispose. Accordingly, they receive offers on their accounts after an online bidding process between the waste buyers and recycling companies registered on the website. The team currently consists of 5 people. However, the business has ambitions to expand to Saudi Arabia and complement its services, among other things, with a waste map and the market status of the waste.

Ecofertile, Morocco

Ecofertile is the first Moroccan company operating since 1992 in the field of composting of organic waste and the production of natural fertilisers for farming and green landscapes. The main processes it applies for its production are dynamic swathing and bio-fermentation (aerobic composting).

BioChar, Morocco

Biochar is a company in Morocco that commercialises the valorisation of agricultural and organic waste. The company has developed two fast and inexpensive organic waste recovery systems: one is the transformation of organic waste from greenhouse crops into biochar (soil conditioner) and the other one is the production of coal

briquettes for energy purposes. Collaborating with BioChar represents a cost advantage for the farmers as it is cheaper than clearing GHG and burning the waste. It therefore offers attractive solutions to divert the waste from unsustainable disposal practices.

Coliba, Ghana

Coliba is a digital start-up that helps homes, businesses and communities to start recycling programs through an incentive-based model. It offers complete plastic recovery, collection and recycling services through its digital solutions and waste picker network. The enterprise's mission is to increase Ghana's recycling rate from the current 2% to 92% by 2030, working with waste pickers across the value chain. Through the #IRECYCLE initiative the enterprise has collaborated with Voltic Ghana Limited and Total Petroleum Ghana Limited (Total) to launch a plastic collection project for proper management of plastic waste from households in Accra and the Tema metropolis.

3 EU-Africa trade from a CE perspective

3.1 Overview of EU-Africa trade¹⁶¹

When we look at the trade relations between the EU and Africa, we see that the EU is an important trade partner for African countries, and Africa is also an important supplier of certain types of goods for the EU, although Africa's contribution to the EU's overall trade is relatively limited. During the period 2015-2018, Africa contributed on average for 2.9% to the EU's overall trade and 6.7% to the total extra-EU trade. During the years 2010-2018 the EU had a trade deficit in its trade with Africa in only two years, but mostly there was a trade surplus over this period, averaging at € 15 bn. Overall, this trade surplus is relatively small, as it compares to an average total trade volume of € 199 bn. It should be noted though, that there are strong differences between Member States with regard to the importance in Africa in trade relations. Only five EU Member states, namely France, Germany, Spain, Italy and the Netherlands accounted for three quarters of the trade with Africa over the last five years, while only accounting for 62% of the trade in the EU27 as a whole.

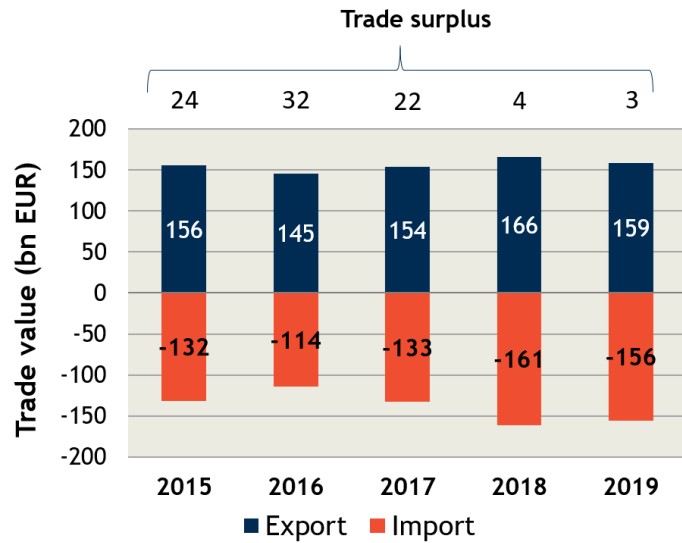
When looking from the African perspective, the picture is slightly different. Africa is a net importer overall, with an average trade deficit of € 109 bn during the period 2015-2018. The EU accounts for roughly one third (34%) of all the Extra-Africa trade, which is more than the share of China (16%) and the United States (7%). During the period 2010-2018, 34% of the exports leaving Africa, had the EU as destination and from all the products imported into Africa 33% originates from the EU27. Within Africa, South Africa and Nigeria are the EU's largest trading partners, followed by several North African countries. Overall, North Africa accounted for 49% of the overall trade in the period 2015-2018, followed by West Africa (21%) and southern Africa (17%), whereas central Africa and East Africa together account for the remaining 13%.

When looking with a bird's eye view at the kind of products being traded, we see that there are substantial differences between the import and export profiles. Within Africa's exports to the EU, fossil fuels represent the largest product group accounting on average for 44% of the total exports during the period 2015-2018. Materials (raw and processed) and chemicals together represent another 18% of the exports, whereas final products such as machinery and equipment and miscellaneous manufactured goods together represent 21% of the exports and agri-food products account for most of the remainder. When looking at the products that Africa imports from the EU we see that Machinery and equipment is the largest product category, accounting on average for 36%, followed by manufactured materials (e.g., steel) and chemicals, both accounting for 14% of the imports. Fossil fuels accounted for 13% of the products imported from the EU and food and beverages accounted for 9%, during the period 2015-2018. A remarkable observation is that in Africa's exports crude resources (fossil resources & minerals) are dominant, whereas processed and final products are dominant in the imports.

An overview of the key figures in the trade relations between the EU and Africa is given in the trade dashboard on the next page.

¹⁶¹ All the figures given in this section are derived from UN Comtrade. Note that Africa as trade partner was a custom aggregate of countries and it is thus possible that the totals contain data from a varying number of countries over the years.

A. Trade balance EU-Africa trade - EU perspective



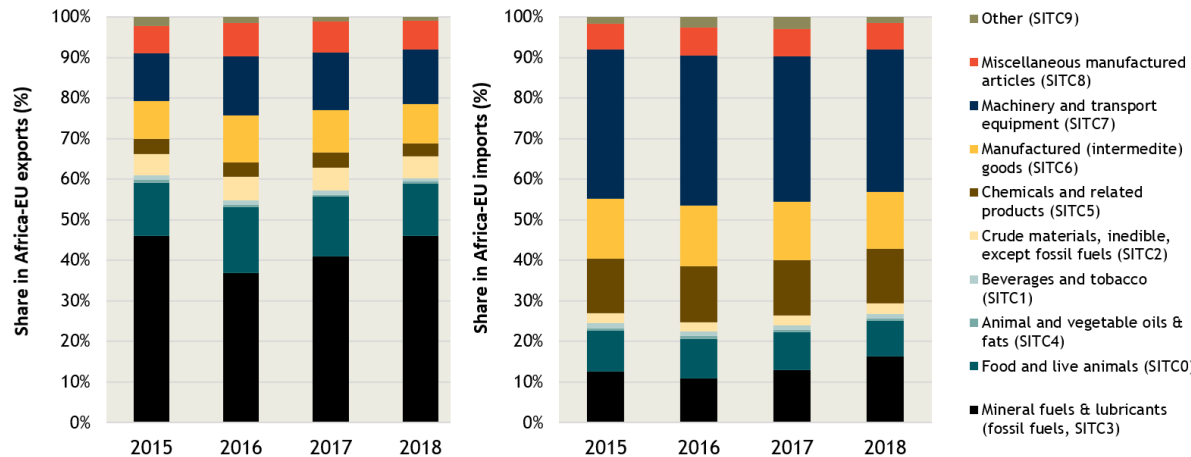
B. Top 5 trade African trade partners EU (top)

	Country	Share in Africa-EU exports	Country	Share in Africa-EU imports
1	South Africa	16%	South Africa	16%
2	Morocco	15%	Nigeria	15%
3	Egypt	13%	Algeria	14%
4	Algeria	12%	Morocco	11%
5	Nigeria	8%	Libya	11%

C. Top 5 EU trade partners for Africa (bottom)

	Country	Share in EU-Africa exports	Country	Share in EU-Africa imports
1	France	18%	Spain	19%
2	Germany	17%	France	19%
3	Italy	12%	Italy	15%
4	Spain	13%	Germany	17%
5	Netherlands	12%	Netherlands	9%

D. Africa-EU trade by product type for exports (left) and imports (right)



Note that the data in these figures is based on data reported by the EU and can differ from the data reported by the African trade partners.

3.2 Analysis of trade flows from a circular economy perspective

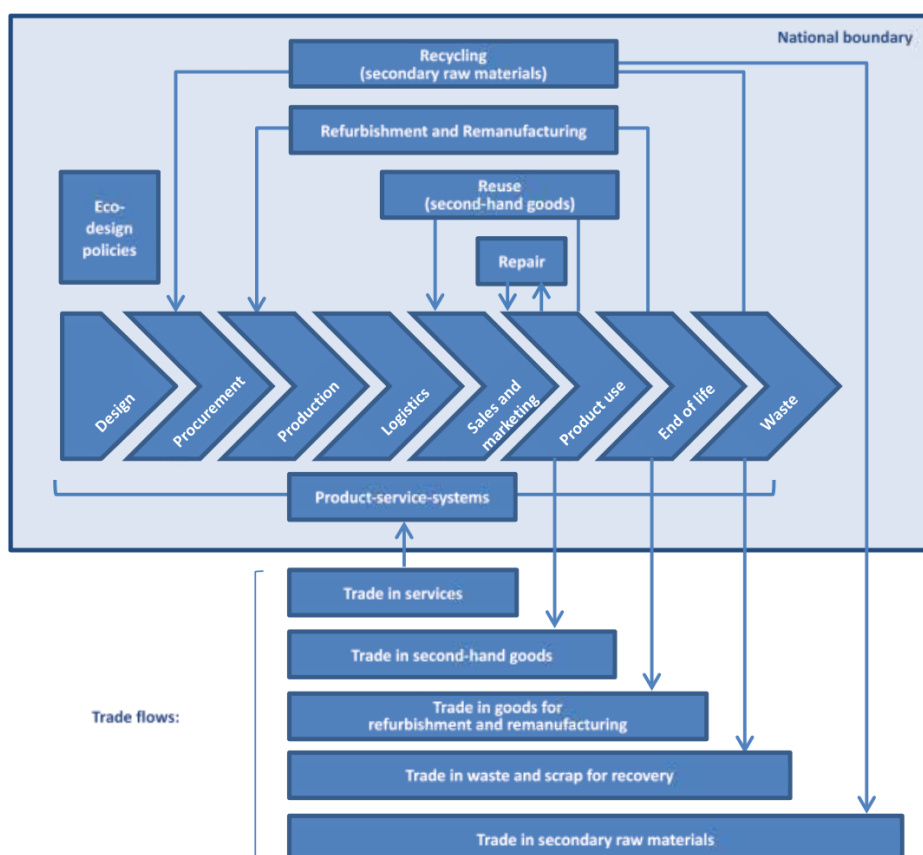
3.2.1 Linkages between trade and circular economy

Circular Economy is a topic that is often addressed at the national or regional level, but in a world of global value chains a circular economy cannot be attained without taking the global trade flows of goods, materials and services into account. The amount of research that has been done on the interlinkages between circular economy and trade are relatively scarce, but this section will summarise the most important findings of the research that has been done in this area up to now.

One of the studies that has looked into the interactions between circular economy and trade is the study undertaken by the OECD and Re-circle named “International Trade and the Transition to a Circular Economy”. The policy paper associated with this study identified five levels at which national supply chains and product use cycles are linked with international trade flows, linked to different stages in the value chain (Figure 3-1). Five main levels of interaction between CE and international trade were identified, namely:

- Trade in services;
- Trade in second-hand goods;
- Trade in goods for remanufacturing and refurbishment;
- Trade in waste and scrap;
- Trade in secondary raw materials.

Figure 3-1 CE-related interlinkages between domestic value chains and CE product and material cycles and global trade flows



Source: OECD & Re-Circle (2018), based on McCarthy, Helf and Börkey (2018), Lacy and Rutqvist (2015) and Rabobank (2015)

Impact of the EU's CE policies on international trade

Until now the EU has implemented a variety of circular economy measures, which mostly focus on regulating the domestic market. However, even though these policies are aimed at regulating domestic players they are not without an impact on international trade. In order to improve the management and treatment of products at their end of life, many Member States have implemented Extended Producer Responsibility (EPR) schemes making companies responsible for proper collection and management of their products at the end-of life. However, these and other policies have incentivized the export of used and end-of life products to non-EU countries. Such phenomena highlight the importance of international cooperation to prevent evasion of environmental policies.

Another side-effect of EcoDesign and EPR policies is that there is the risk that the increases in cost provoked by these policy instruments hampers the competitiveness of European producers and indirectly promotes increased imports of products from third countries lacking such policies.¹⁶² At the same time, (environmental) product standards can also act as trade barriers due to differences in quality standards and criteria in different jurisdictions.¹⁶³ In this context, international agreement on product and material quality standards or mutual recognition of equivalent systems could be a good step in the right direction to remove these unintended barriers.

Trade in services to promote a CE transition

Services play an important role in the circular economy, not only in the area of waste management, recycling and environmental management services, but also in the shift from ownership-based to access-based business models. Currently, trade in services is a clearly underexposed topic, as highlighted by the lack of data on trade in services. A recent study analysed the role of services in CE development and identified multiple barriers for international operations of service companies. In this study differences in regulatory frameworks, especially in the area of waste management and greenhouse gas accounting were identified as major barriers.¹⁶⁴

Trade in second-hand goods, goods destined for refurbishment and manufacturing

One of the controversial in the context of circular economy and trade relates to the trade in second-hand products. On the one hand this trade gives developing countries access to affordable products, but on the other hand the shift to products with higher environmental performance is slowed down and such flows can have a negative impact on the development or performance of domestic manufacturing businesses. Next to this, flows of second-hand products are often used for the illegal shipment of wastes (which is the case for electronics, textiles as well as vehicles, amongst others). One of the most prominent debates in this context concerns the discussion on how to address the illegal shipment of E-waste. Under the COP14 of the Basel convention an attempt was done to implement controls for end-of-life electronic products, but some parties including the EU argued that an exception should be made for products labelled for repair.¹⁶⁵ Many developing countries as well as several NGOs argued that this leaves the door open for illegal shipment practices.

¹⁶² Kettunen, M., Gionfra, S. and Monteville, M. (2019) [EU circular economy and trade: Improving policy coherence for sustainable development](#), IEEP Brussels / London

¹⁶³ Yamaguchi & Steenblik (2018) [International trade and the transition to a more resource efficient and circular economy -concept paper](#)

¹⁶⁴ IISD (2020) [Trading services for a circular economy](#)

¹⁶⁵ Kettunen, M., Gionfra, S. and Monteville, M. (2019) [EU circular economy and trade: Improving policy coherence for sustainable development](#), IEEP Brussels / London

At the same time, in some areas regulations prevent the trade in products that should be promoted from a CE perspective. For instance, regulatory issues hindered companies in organising their reverse logistics to recover their end-of-life products because these products were labelled as waste. Furthermore, some remanufactured products faced export barriers due to non-compliance with new product standards.

Trade in waste and secondary raw materials

Resources are not uniformly distributed over the globe and there are disparities in material demand between countries. From this perspective, trade in recyclable wastes and secondary materials should be promoted. However, in practice, it has been shown that wastes tend to be shipped to countries with less stringent environmental legislation or a lack of capacity to enforce those.¹⁶⁶ As a consequence, wastes shipped for recycling are often improperly managed and lead to local health problems and environmental pollution. Even though certain waste streams can contain valuable materials that can be recovered, this does often not way up to the costs associated with the treatment of the remaining materials including toxic substances. Even though the EU Waste Shipment Regulation prohibits the trade in hazardous wastes to third countries (with some strongly regulated exceptions), the EU is an important player when it comes to the export of recyclable wastes including plastics. For a long time, the way in which recycling statistics were handled in the EU incentivised such trade as all exports of recyclable wastes could be reported as “recycled” regardless of the actual treatment in the destination country.¹⁶⁷ In 2018 these rules were revised and as of May 2020, EU Member States need to monitor the waste management in the destination country and can only count export towards their recycling target when entry into a recycling facility has been registered. However, this change will only have an effect if sufficient capacity exists in the destination country to verify such claims.

Despite the problems mentioned above, well-manage trade in recyclable waste and secondary material can positively contribute to the circular economy. Currently, a lack of internationally agreed waste classifications and quality standards for secondary materials hamper such trade. Under the Basel Convention an international ban on the export of plastic waste from OECD to non-OECD countries was agreed upon in 2019. Even though this may be a welcome measure on the short term to address the urgent and growing problem of plastic pollution and marine litter, but on the long-term a less restrictive but well-regulated trade of plastic waste will likely be preferable. In this context, a working group under the Basel Convention is working on criteria and definitions for distinguishing between recyclable and non-recyclable plastics.

When looking specifically at the trade in secondary materials, one sees that there is a lack of quality standards and procedures to verify the quality of secondary materials, which hinders the development of an effective secondary materials market for some material types. Also, in many cases additional export restrictions apply to secondary materials.¹⁶⁸

¹⁶⁶ Kettunen, M., Gionfra, S. and Monteville, M. (2019) [EU circular economy and trade: Improving policy coherence for sustainable development](#), IEEP Brussels / London

¹⁶⁷ D’Amato, Paleari, Pohjakallio, Vanderreydt & Zoboli (2019) [Plastics waste trade and the environment](#)

¹⁶⁸ Yamaguchi & Steenblik (2018) [International trade and the transition to a more resource efficient and circular economy -concept paper](#)

Data on CE-related trade flows is lacking

Finally, to better understand the interactions between CE and trade and improve the measures to promote desired CE-related trade flows and mitigate undesired impacts, it is essential that data quality and availability is improved. Currently, trade codes distinguish insufficiently between new and used products and virgin and secondary raw materials. Furthermore, if such detailed categories do exist data is often lacking. Next to this, it is important that the link between trade data and waste statistics are improved.¹⁶⁹ For waste statistics, the same problem of lacking data exists as in trade data, but when we look at the African context, we see that the quality of waste and recycling data is much poorer than the trade data. In many cases, waste data is lacking altogether, strongly outdated or only applies to certain (mostly urban) areas in a country.

3.2.2 Trade in products relating to the EU's new CE Action plan

In the spring of 2020, the European Commission published its new Circular Economy Action Plan, which contains policy actions to promote circular economy practices in seven focus sectors, namely:

- Electronics & ICT;
- Batteries and vehicles;
- Packaging;
- Plastics;
- Textiles;
- Construction and buildings;
- Food, water and nutrients.

In this section, the trade flows for all of these product groups will be analysed and discussed in the light of the shift to a more circular economy in the EU and in Africa. Packaging and plastics will be discussed together.

Electronics & ICT products

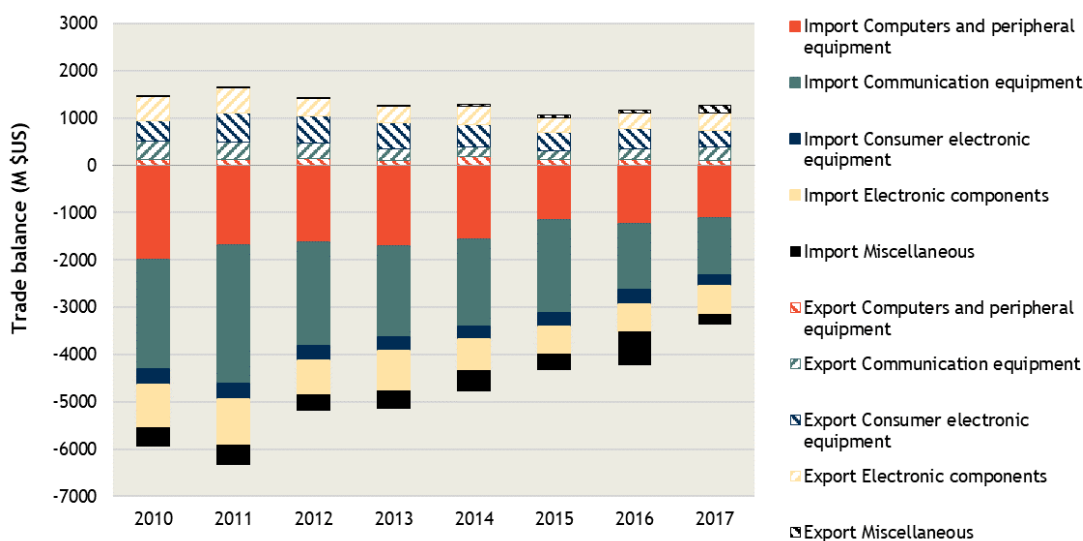
When it comes to trade in electronics and ICT products between Africa and the EU, Africa still faces a significant trade deficit. The product categories with the largest import values are computers and communication equipment (e.g., mobile phones). Within the imports of electronics and ICT products there are also significant volumes of trade in second-hand products. The issue with these second-hand product flows is that they are insufficiently checked by custom services and as a consequence these flows often contain significant amounts of defective products. These trade flows are thus used as a means to illegally ship E-waste and thereby evade EU waste regulations. According to recent estimates over 150 kt of E-waste is shipped to Africa on an annual basis, where Nigeria and Ghana and more recently Zanzibar are important destinations.¹⁷⁰ The UK is the largest exporter, followed by Italy and Germany.¹⁷¹

¹⁶⁹ Kettunen, M., Gionfra, S. and Monteville, M. (2019) [EU circular economy and trade: Improving policy coherence for sustainable development](#), IEEP Brussels / London

¹⁷⁰ Basel Action Network (2018) [Holes in the Circular Economy - WEEE leakage from Europe](#)

¹⁷¹ *Ibid*

Figure 3-2 Africa-EU trade in ICT products over the period 2010-2017



Source: Data derived from UNCTAD, based on [UNCTADs \(2014\) definition of ICT Goods](#)

When looking at the electronics value chain in Africa one sees that the manufacturing stage for this product group is occurring almost exclusively outside the continent and as such it is almost completely dependent on imports for its domestic consumption. Subsequently, products remain in the continent at the end-of-life stage, which leads to an accumulation of imported E-Waste and the waste generated from electronic products used in the continent. In most cases the capacity for proper management of this waste category is lacking, leading to serious health problems and environmental pollution. There are, however, also some examples of African countries that are proactive in addressing this growing problem. Rwanda is not an important destination for imported E-waste, due to its landlocked location, but still E-waste is a growing concern due to growth in the domestic use of electronic appliances. Recently, the country has invested in a new E-waste management facility, where E-waste is refurbished or dismantled and then repurposed or recycled.¹⁷² The plastic from the products is processed into small pellets and used in other industries to make new plastic products, the steel is recovered and processed into new steel products by a factory nearby and the circuit boards are exported to Dubai for specialised recycling.

Batteries and vehicles

Car use is still very low in Africa, although strong differences exist between countries. Next to this, the car fleet is growing significantly in many countries. Used cars account for the lion's share of all cars on the road in Africa, representing more than 60% of the light-duty vehicles that are added to the African fleet each year.¹⁷³ In the period 2015-2018, approximately 5.6 million used vehicles were imported into Africa. Even though this contributes to the affordability of car use it also brings substantial environmental problems, especially with regard to air pollution in large cities.¹⁷⁴ In order to fight the problems related to used vehicles, a significant number of African countries have implemented legislation to regulate used vehicle imports. Almost half of the countries in Africa have introduced age restrictions for used vehicles that can be imported, and 10 countries implemented a full import ban on used vehicles. Others have introduced minimum requirements relating to fuel standards or emission performance. Often cars that fail to comply with national regulations due to defective parts are exported to non-EU countries instead

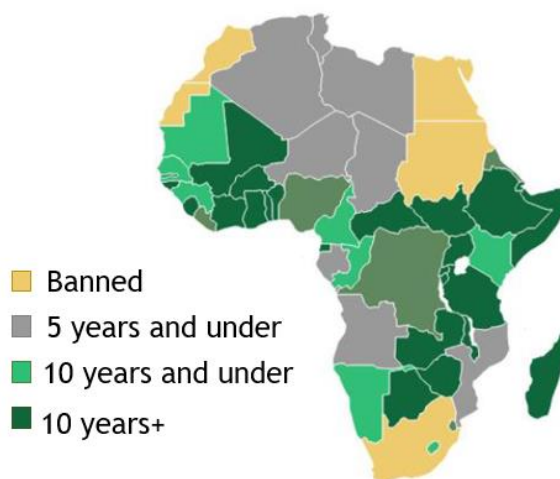
¹⁷² Kovacevic (2020) [Rwanda setting example for electronic waste recycling](#)

¹⁷³ UNEP (2020) [Used vehicles and the environment](#)

¹⁷⁴ *Ibid*

of being scrapped, often resulting in air pollution and other negative environmental and safety impacts in destination country. Sometimes, emission reduction equipment like catalytic converters or safety equipment is stripped from the exported cars and sold individually as car parts and as a consequence these cars are driven around with increased pollutant emissions or impaired passenger safety.

Figure 3-3 Trade restrictions on used vehicle imports in African countries



Adapted from: [UNEP \(2018\)](#)

Besides the issues related to the poor environmental performance of the imported used vehicles, there are also significant numbers of end-of-life vehicles (ELVs) illegally shipped to Africa labelled as second-hand cars. Around one third of the cars leaving the roads in the EU are missing and not properly treated. In 2017, these ‘ELVs with unknown whereabouts’ amounted to 870,000 units, which are mostly exported non-EU countries, where Africa is a major destination. In this way, the exporting companies can evade the environmental requirements laid out in the EU’s ELV Directive. A recent study for the Dutch Ministry of environment compared a group of cars being directed for scrapping with a group of cars that were being exported to Africa and it was found that these two groups of cars were very similar in their characteristics.¹⁷⁵ Furthermore, it was discovered that part of the deregistered cars destined for scrapping were in reality, exported to Africa. In the most recent evaluation of the EU ELV Directive, it was also concluded that the directive was not fully effective in addressing the illegal exports of ELVs¹⁷⁶, and therefore options to better address this issue are being considered in the ongoing Impact Assessment.¹⁷⁷

Due to the growing use of electronics in our daily lives and the shift from cars with internal combustion engines to electric vehicles, the demand for and importance of batteries in our economy is increasing, together with the need for sound handling and recycling. By 2030, the demand for batteries might have increased 14-fold compared to today’s levels.¹⁷⁸ Africa is a net exporter of battery scrap, but a large share of the battery waste is treated domestically, but this is often done under poor conditions leading to environmental pollution and human health risks.¹⁷⁹ When looking only at lead-acid batteries from conventional cars a total volume of 1.2 million tonnes of end-of-life lead-acid batteries is generated on an annual basis accounting for 800 kilotons of lead.

¹⁷⁵ Ministry of Infrastructure and Water Management (2020) [Used Vehicles Exported to Africa](#)

¹⁷⁶ Trinomics & Oeko Institut (2020) [Supporting the Evaluation of the Directive 2000/53/EC on end-of-life vehicles.](#)

¹⁷⁷ EC (2020) [Inception report Impact Assessment ELV Directive](#)

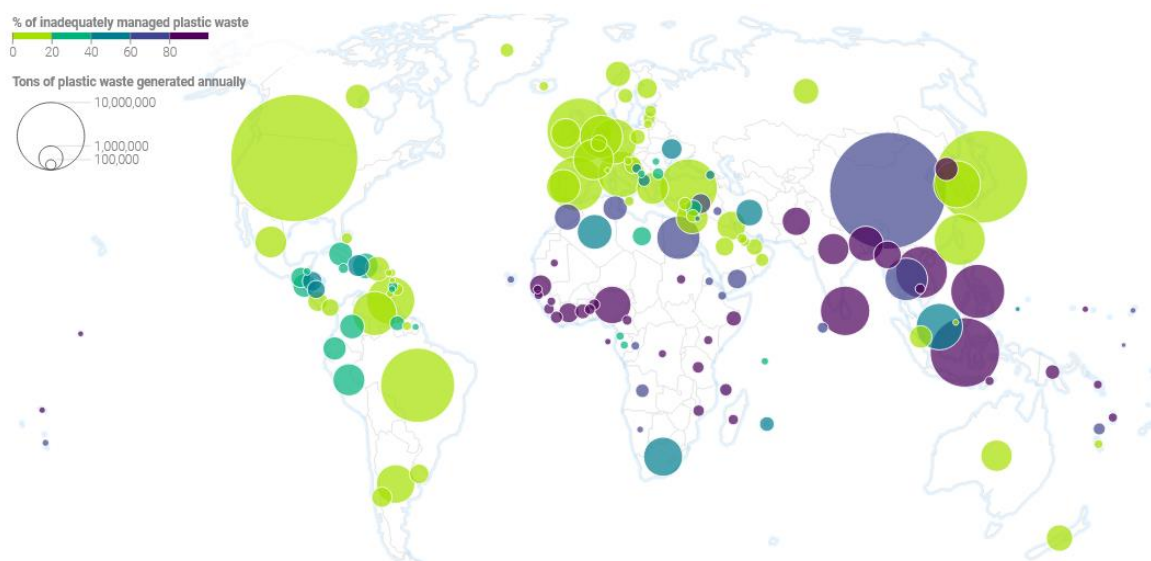
¹⁷⁸ EC (2020) [Green Deal: Sustainable batteries for a circular and climate neutral economy](#)

¹⁷⁹ Oeko Institut (2016) [The deadly business - Findings from the lead recycling Africa Project](#)

Plastics and packaging

Packaged products are increasingly used in Africa, which is reflected in the growing volumes of packaging waste but also in the growing volumes of imports of packaging materials. During the period 2015-2018, Africa had an average net import of € 1.12 bn in packaging products, where plastics account for over 70% of the total import value. When zooming in on plastics, we see that Africa is a large importer of both primary plastics as well as plastic (packaging) products and domestic plastic production is happening in a very limited number of countries. Even the large oil producer Nigeria is a net importer of plastics. A combination of improved collection of packaging waste and the establishment of a plastics manufacturing sector that is able to use plastic waste as a feedstock for new plastics could be a good way forward to a more circular future with less plastic waste. To make such efforts successful, it is important that large industrial players that sell products packaged in single-use plastics are involved in the transformation process. Making foreign producers co-responsible for the management of their products in the end-of-life stage could be investigated, but a complication in such measures is that plastic imports often occur via local independent importers and sometimes with several intermediaries. The large number of intermediaries can make it difficult to prove that the product originates from a certain producer and the large number of small importers can make the enforcement of EPR legislation challenging given the limited capacities of government authorities in many African countries. Currently, even though Africa is a relatively small consumer of plastics from the global perspective, it has among the highest shares of inappropriately managed plastic waste streams in the world (Figure 3-4) and as a consequence, the continent contributes significantly to plastic pollution in the environment and the world's oceans.

Figure 3-4 Plastic waste generation and shares of inadequately managed plastic waste by region



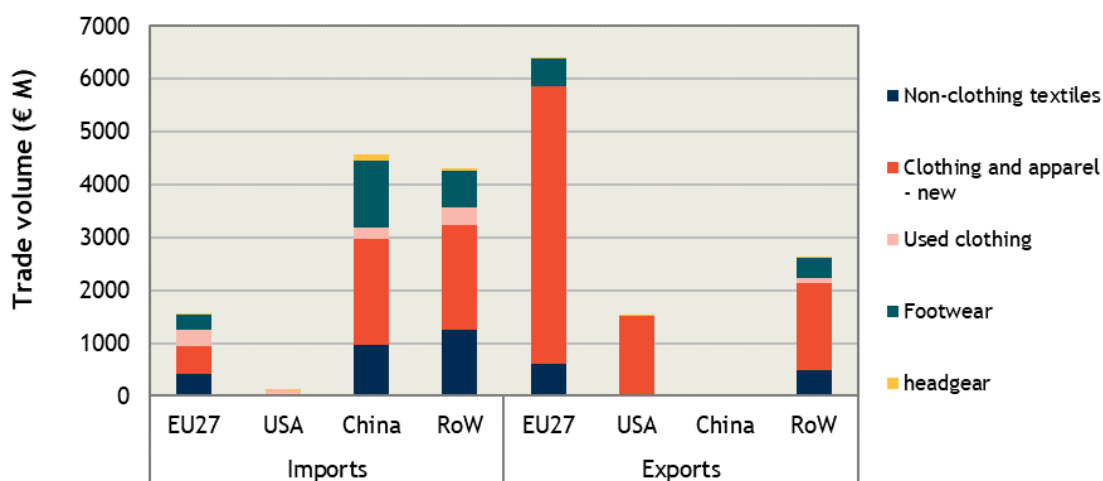
Source: Jambeck et al. (2015) [Plastic waste inputs from land into the ocean](#)

Textiles

When looking at Africa's overall trade in textiles, we see that the trade balance is almost neutral, with an export surplus related to new clothing and apparel, and a trading deficit for footwear and non-clothing related textiles (Figure 3-5). In its trade with the EU, there is an overall trade surplus for Africa as it exported on average € 4.5 bn in new clothing items over the period 2015-2018. During that same period roughly 1.2 Mt of used clothing were exported from the EU to Africa on an annual basis, worth a value of

€ 268 M. Even though Africa is an exporter of clothing, it also imports significant amounts of clothing from China and other Asian countries.

Figure 3-5 Overview Africa's textiles trade in 2017 (left) and imports of clothing in (new and used) (right)



Source: UN Comtrade data; where non-clothing textiles consists of HS codes 60 and 63 (except 6309), Clothing and apparel new: HS codes 61 & 62, Used clothing: HS code 6309, footwear: HS code 64 and headgear: HS code 65.

Imports of cheap new clothing and especially imports of cheap second-hand clothing, where the EU accounts for a third of all the imports, are controversial as this has contributed to the strong decline in the African textiles industry. In the 1990s, a large share of Africa's textiles industry disappeared due to the intensifying international competition.¹⁸⁰ Where Africa's clothing industry employed 500,000 people in the past, only 20,000 of them are left today. In response to this, several African countries have been considering or have implemented import bans on used clothing. The East African Trade Community has already considered to implement a ban on imports for used clothing, but this has led to a trade dispute with the United States, who threatened with cancelling preferential market access for the countries involved. Within Africa, the anticipated impacts of the ban are not undisputed. It has been argued that such bans will also lead to reduced government income due to foregone import duties and will increase the prices of clothing for the consumer¹⁸¹. Furthermore, a ban on used clothes will not completely solve the problem as cheap new clothing, especially from Asia is also a threat to Africa's domestic clothing industry. Lastly, to revive Africa's textiles industry some other measures will be needed as well, including an attractive fiscal climate and improved transport and energy infrastructure.

Today's global textiles industry is very unsustainable as it uses large amounts of resources while having significantly negative impacts on the environment and society. These include, on the social side, poor working conditions, exploitation or gender inequality. On the environmental side, the textiles industry contributes to 8% of global GHG¹⁸² and pollutes water ways through the release of micro-plastics or dyeing chemicals, whose extent and health implications are still unknown¹⁸³. Therefore, a shift away from cheap fast fashion to a more circular model for textiles that produces ethically sourced and long-lasting textiles, could help to direct the industry to a sustainable path. However, the interactions between trade and trade regulations and the shift to a more circular economy are complex. This is definitely true for the textiles industry as its value chain is especially long.

¹⁸⁰ Trade Mark (n.d.) [A send-hand clothing ban in East Africa?](#)

¹⁸¹ *Ibid*

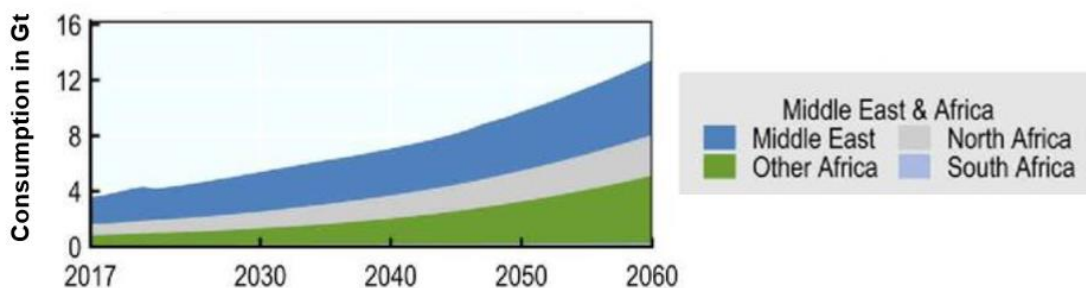
¹⁸² World Bank (2019) [How much do our wardrobes cost to the environment?](#)

¹⁸³ AfDB (2019) [Towards a sustainable textile and fashion industry in Africa](#)

Construction and buildings

The construction sector is a strongly growing sector in Africa. Driven by economic growth and the strong increase in population the demand for construction materials is growing steadily. If current trends are not changed, the demand for construction materials is expected to have tripled by 2060 (Figure 3-6). With an eye on climate change and the environment this is a concern, as globally the built environment is responsible for approximately 48% of all the global resource use and 17% of the global greenhouse gas emissions (including residential energy use).¹⁸⁴

Figure 3-6 Forecasted increases in demand for construction minerals in Africa

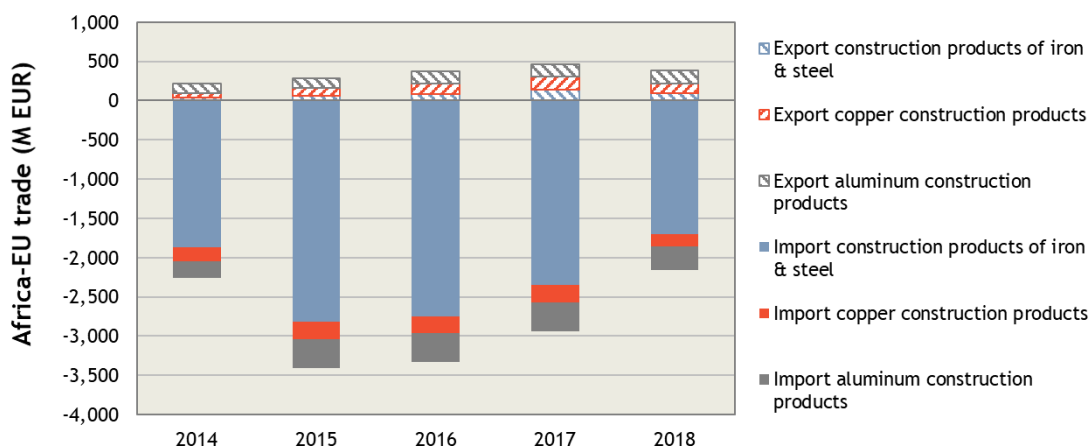


Source: OECD (2019) *Global Material Resources Outlook to 2060: Economic Drivers and Environmental Consequences*. OECD Publishing, Paris. DOI: <https://doi.org/10.1787/9789264307452-en>

The construction sector in Africa is currently heavily dependent on imports of construction materials. In its trade with the EU, Africa has been facing a trade deficit between € 3.8 bn and € 7.0 bn in the period 2014-2018¹⁸⁵. Metal products (especially of iron & steel) represent the largest part of the import value of construction products (

Figure 3-7), followed by wooden products and plastic products. Apart from wooden construction products, Africa is also a net importer of raw timber from the EU while in its global trade relations Africa is a net timber exporter. This is a tricky position given the fact that Africa currently has the highest deforestation rate in the world.

Figure 3-7 Africa-EU trade balance of construction products of the most commonly used metals



Source: UN Comtrade

The high import deficit for iron & steel construction products is another illustration of the fact that most African countries still lack a solid manufacturing sector, whereas upstream activities in mining and

¹⁸⁴ Circle Economy (2019) *The Circular Economy Gap report 2019*

¹⁸⁵ See annex D for a summary of the trade codes included in this analysis of construction products.

resource extraction are well-developed. While Africa had an average net export of € 423 M of iron ores during the period 2014-2018, it was a net importer of iron and steel amounting to average net imports of € 1.8 bn and a net importer of finished iron and steel products of € 3.5 bn. Developing a steel sector in Africa could help reduce the dependence on imported steel, while at the same time providing a “sink” for the abundant steel scrap available in the continent, e.g., from ELVs or other wastes. In this way Africa can grow its industrial sector, providing economic growth and job opportunities while also establishing a source of sustainably produced secondary steel.

In general, there are many opportunities in the construction sector for the implementation of circular strategies, as described in section 2.2.2. The implementation of such actions can reduce or at least minimise further growth of Africa’s trade deficit relating to construction products.

Food, water and nutrients

Raw agricultural products and food products are a large product category in EU-Africa trade, and even though agriculture represents a large share of the African economy, the continent is still a net importer of agri-food products, with imports being three times as high as the exports. This is caused by a number of factors, such as low average agricultural productivity combined with a rapidly growing population. Several circular strategies could help to improve productivity in Africa’s agricultural sector, thereby contributing to increased farmer income, food security and a reduction in food import needs. If we would extrapolate our findings on food losses to the continent level, this would mean that a total value of € 22 bn is lost on an annual basis in the agri-food value chain. Reducing these losses by 50% could thus improve the trade balance with almost € 11 bn, which would almost completely nullify the trade deficit in this product category. It should be noted though, that large differences exist in the size of the food losses across countries.

In order to increase Africa’s productivity, it is also likely that nutrient inputs need to be increased. This does not mean that African countries will need to reach EU-levels of fertilizer inputs in order to achieve satisfactory yields, but it is likely that some increase in nutrient inputs would be beneficial. Circular economy can contribute to reduce the environmental impacts of this development by satisfying part of this growing demand by organic fertilizers. In most African countries organic waste forms a major component of the overall waste generation, so this could be very well committed to increased production of soil improvement and organic fertilizer products.

Currently, most African countries are still highly dependent on fertilizer imports to satisfy their domestic demand. However, due to a small number of large fertilizer exporters in the continent (e.g., Morocco and Egypt) there is a net trade surplus for fertilizer products in Africa-EU trade. Most of this is related to the exports of phosphates from northern Africa to the EU. This does mask the fact that many smaller African countries are highly dependent on fertilizer imports for their agriculture sectors.

3.3 The impact of an EU CE transition on trade with Africa

The effects on EU-Africa trade should the EU move towards a (more) circular economy is carried out using Cambridge Econometrics’ E3ME model, a global macro-econometric model that builds on a historical database of econometric data and projects forward annually until 2030 (for details see Annex C). The model is particularly suitable for the simulation of alternative projections for an economy under varying conditions and policies. It assesses the outcomes for each scenario against a baseline, i.e., the most-likely trajectory in the absence of further policy changes.

In the analysis presented here, all scenario assumptions used for the EU economy are consistent with the analysis of the CE transition in the EU that has been modelled in the 2018 study on the [‘Impacts of circular economy policies on the labour market’](#). In that report, two separate scenarios are assessed, both focusing on circular economy transition in the EU:

1. A **‘moderate’ scenario**, assuming a moderate uptake of circular economy activities - driven by measures contained in the Circular Economy Package¹⁸⁶ and a moderate sectoral transformation further supporting the transition;
2. A more **ambitious scenario**, assuming a faster transition to the circular economy compared to the moderate scenario.

The modelling therefore reflects an economic transition to the circular economy, at different ‘speeds’ (moderate vs ambitious). Results for the moderate and ambitious EU scenarios are compared to a baseline scenario, which assumes the continuation of current trends in material use.

Both scenarios work through the adjustment of several inputs and assumptions to E3ME. Scenarios assume an adjustment (at differing levels) of usage of alternative materials, energy sources, virgin materials (e.g., metals, plastic, petrol), and substituted them with recycled materials or organic waste. Furthermore, we assume an increase in repair activities and in the extent of the collaborative economy (growth of sharing, thus reduction in demand for traditional products and an increase demand for the household sector). The selected sectors for which the input assumptions were adjusted are those which are considered as having a major CE transition potential in the EU and therefore modelled as experiencing direct effects of the circular economy transition. These sectors are ‘food products & beverages’, ‘motor vehicles’, ‘construction’, ‘electronics and electrical equipment’, ‘waste collection and treatment’.

A summary of the assumptions used for the EU CE transition scenarios is included in Annex C. Full details of the selection of sectors, assumptions and scenario inputs are available in the report [‘Impacts of circular economy policies on the labour market’](#). The scenarios and their underlying assumptions are unchanged from those used for the analysis presented in that report, i.e., no further assumptions have been made regarding the EU’s transition, nor is the African continent assumed to undergo a CE transition in this part of the analysis. The effects of a CE transition within Africa are explored in Section 4.1.

3.3.1 Total African imports and exports

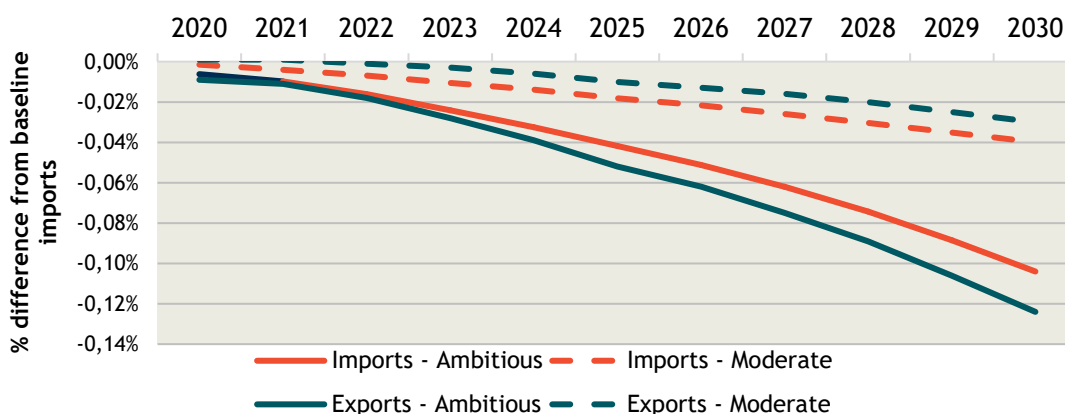
The CE transition in the EU reduces EU imports demand for certain raw materials and basic manufacturing products. Consequently, African export numbers, along with other EU trading partners, are reduced. Total exports from Africa gradually decrease by -0.03% and -0.12% by 2030 (compared to the baseline, in the Moderate and Ambitious scenarios respectively), while imports to Africa are reduced by -0.04% and -0.1% by 2030, mainly as a result of supply-chain impacts from the reduction in exports (compared to the baseline, in the Moderate and Ambitious scenarios respectively).

When comparing these impacts to the direct impacts of reduced fossil fuel imports by the EU, due to the Union’s climate targets, the impacts of the CE transition are really negligible. In 2019, the EU imported € 61.2 bn worth of fossil fuels from Africa. The recently published impact assessment of the Climate Target Plan estimated that the different scenarios for a 55% GHG reduction in 2030 would reduce

¹⁸⁶ The European Commission’s Circular Economy Package, as adopted on December 2, 2015.

coal imports with 71-77%, oil imports with 23-25% and gas imports with 13-19% compared to 2015.¹⁸⁷ If this would impact all of the EU's trading partners equally, this would imply a reduction in fossil fuel imports from Africa of € 11.8-13.4 bn (or a 4.5-5.1% reduction in overall trade *ceteris paribus*). Naturally, this decrease in imports would be partially compensated by increased imports of electricity and low-carbon fuels from Africa as well as material resources to produce clean energy technologies. Still, these figures show how important it is in the policy dialogue between the EU and Africa, to pay more attention to the economic impacts of the greening of the EU's economy on Africa.

Figure 3-8 Change in total imports and exports to and from Africa



Overall, the model results thus suggest that a transition to a more CE in the EU would lead to small reductions in EU-Africa trade compared to a business-as-usual case, yet the impact on Africa's balance of trade is negligible as both imports and exports are reduced simultaneously the net changes (all sectors combined) are moreover relatively small in percentage terms, yet effects by sector can show larger variations (as shown in the next section).

3.3.2 Imports and exports by sector

Sectoral results for Africa show small effects on the 5 sectors with major transition potential in the EU (i.e., 'food products & beverages', 'motor vehicles', 'construction', 'electronics and electrical equipment', 'waste collection and treatment'), but stronger effects for trade in those sectors affected by the changes in material consumption across the EU, i.e., those sectors producing and exporting goods for which demand from the EU would change in a more circular EU economy. The model results suggest a small decrease in trade (both imports and exports) or no change for most sectors, as can be seen in Figure 3-9 and

Figure 3-10.

¹⁸⁷ SWD(2020) 176 final - [IMPACT ASSESSMENT accompanying the document 'Stepping up Europe's 2030 climate ambition - Investing in a climate-neutral future for the benefit of our people'](#)

Figure 3-9 Change in imports to Africa

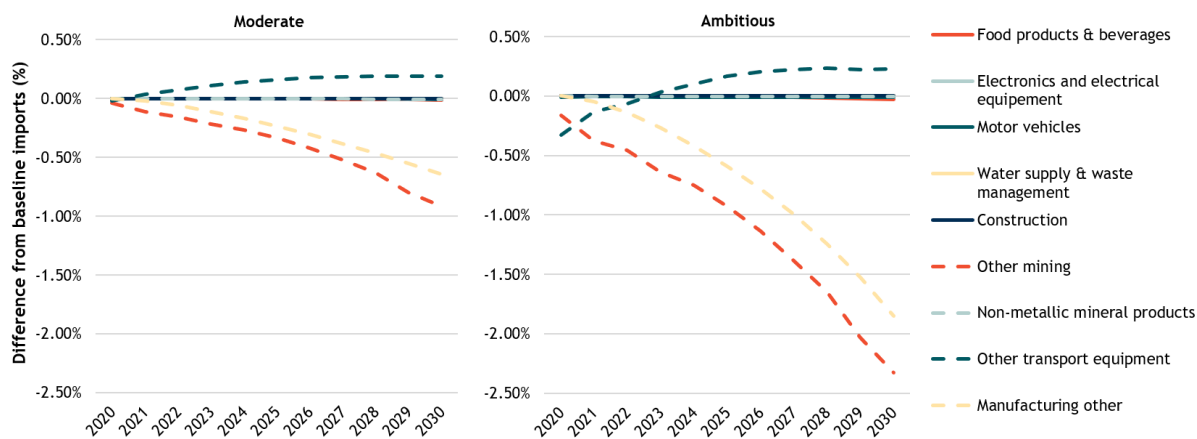
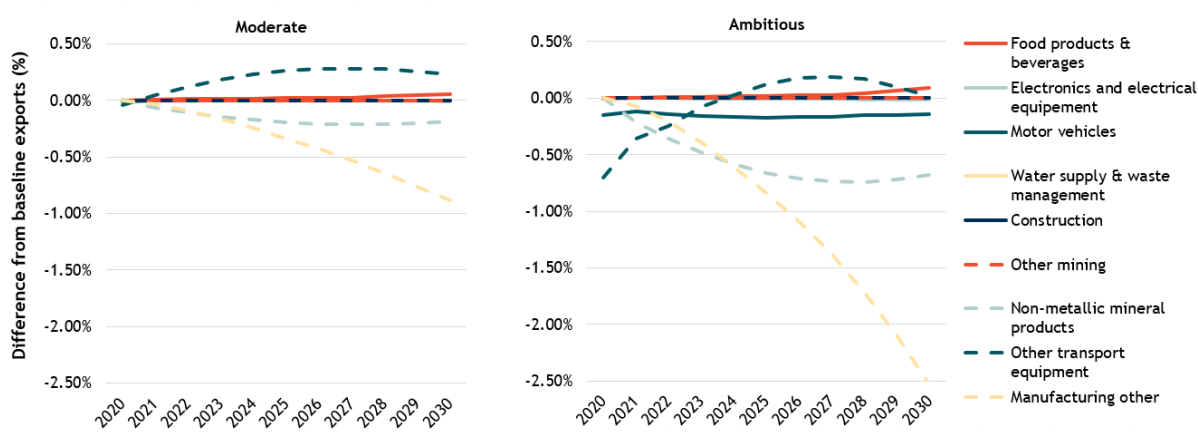


Figure 3-10 Change in exports from Africa



First, in the **food and beverages sector**, African exports of food and beverage marginally grow (0.09% and 0.05% difference from baseline by 2030 in Ambitious and moderate scenarios respectively), while imports marginally drop (-0.03% and -0.01% in Ambitious and Moderate) and employment increases (0.04% and 0.02%). This indicates a possible shift of food and beverage production from the EU to Africa.

Second, the model projects lower exports (between -0.12% to -0.17% between 2020-2030) of **motor vehicles** from Africa in the Ambitious scenario, caused by the high reduction of vehicle purchases across the EU (-15% reduction). As South Africa is the continent's largest producer of vehicles and its most important trade partners are European countries (Germany, UK, Belgium, etc.) this effect can be attributed to the reduced demand for vehicles across the EU. At the same time, imports of motor vehicles to Africa are around 0.010% lower than baseline by 2030.

Third, looking at the most impacted sectors in Africa, trade by the '**manufacturing other**' sector is strongly affected both in terms of exports from and imports to Africa (export losses of -2.53% and -0.88%, import losses -1.86% and -0.65% compared to the baseline by 2030 in the Ambitious and Moderate scenarios respectively). Considering the corresponding NACE classifications (the sector includes furniture, jewellery, sports goods, toys, medical instruments, etc. manufacturing, but also repair activities) and the scenario inputs, this can be attributed to an increased number of local repairs in the EU replacing 'new' consumption or replacement of goods such as toys, sporting goods and furniture.

Fourth, the model projects lower exports of **non-metallic mineral products** from Africa (-0.68% and -0.18% in Ambitious and Moderate scenarios respectively), which can be attributed to the more efficient usage of raw materials and recycling in the EU. Imports of non-metallic mineral products to Africa remain at baseline levels.

Fifth, as for imports to Africa, a gradual loss (-2.33% and -0.92% in Ambitious and Moderate scenarios by 2030) of **other mining** imports can be observed. This category includes support activities for natural resources extraction, which is most likely driving this decrease as regulations tighten on European service operators. Exports within the other mining sector remain at baseline levels.

Sixth, an exception to the rule that trade would decrease or remain unchanged is the other **transport equipment sector**, for which the model projects an increase in both imports and exports over time, as this sector is a key supplier to repair and installations (which sees a big increase in output in the EU).

3.4 The role of CE in trade agreements, regulation and trade policies

The EU's trade relationship with Africa is governed by a range of trade agreements including regional EPAs, Association Agreements as well as overarching trade agreements. Currently, 52 African countries benefit from a trade agreement, an Economic Partnership Agreement (EPA) or a trade arrangement with the EU, granting them privileged access to its market. In following both existing agreements as well as agreements which are still under negotiation will be analysed according to their potential to improve CE-related EU-AU trade. For each agreement, existing CE-elements are highlighted and potential gaps/shortcomings are identified.

3.4.1 Overarching trade agreements

The Cotonou Agreement/Post-Cotonou Agreement¹⁸⁸

The Cotonou Agreement is currently the overarching framework for EU relations with African, Caribbean and Pacific (ACP) countries. It sets the basis for regional partnership and trade agreements (see below), aiming to allow duty free access for essentially all products from all LDC countries. The agreement was adopted in 2000 and is based on three pillars:

- development cooperation;
- economic and trade cooperation;
- political dimension.

Although the trading arrangements listed within the Cotonou Agreement do not specifically refer to circular economy, the objectives of the agreement clearly indicate that “The principles of sustainable management of natural resources and the environment shall be applied and integrated at every level of the partnership”. Furthermore, all parties underline their commitment to promote the development of international trade in such a way as to ensure sustainable and sound management of the environment. In the most recent revision of the agreement in 2017 (Decision (EU) 2017/435) the agreement was furthermore adapted to focus on issues such as: climate change; food security; sustainability of fisheries; and meeting the Sustainable Development Goals, all of which show a significant overlap with CE-related issues¹⁸⁹.

¹⁸⁸ European Council (n.d.) [Cotonou Agreement](#)

¹⁸⁹ European Commission (n.d.) [Summary of the Partnership agreement 2000/483/EC – between ACP countries and the EU](#)

Although the Cotonou Agreement was initially due to expire in February 2020, its application has been extended to December 2020, as negotiations on its successor are still under way. The post-Cotonou agreement is very likely to reflect the ECs recent objectives including the EU's Green Deal and therefore has a strong potential to facilitate the trade of CE-goods and services as well as to strengthen sustainable value-chains and food systems¹⁹⁰.

African Continental Free Trade Area

On March 21, 2018 44 African countries signed The African Continental Free Trade Area (AfCFTA), at the 10th Extraordinary Summit of the African Union. The agreement connects 55 countries and 1.3 billion people with a combined gross domestic product (GDP) of US \$3.4 trillion, making it one of largest free trade areas in the world. The agreement officially entered into force on May 30, 2019, after ratification of the agreement by 22 countries. As of September 2020, the AfCFTA had been ratified by thirty countries, with more ratifications in process.¹⁹¹

The AfCFTA is the African continent's most ambitious integration initiative, whose main objective is to create a single continental market for goods and services with free movement of people and investments, thus expanding intra-African trade across the continent, enhancing competitiveness and supporting economic transformation in Africa.¹⁹² The agreement, among others, aims to reduce tariffs among member countries and cover policy areas such as trade facilitation and services, as well as regulatory measures such as sanitary standards and technical barriers to trade. It will further complement existing sub-regional economic communities and trade agreements in Africa by offering a continent-wide regulatory framework and by regulating policy areas—such as investment and intellectual property rights protection that so far have not been covered in most sub-regional agreements in Africa.^{193,194} The AfCFTA also explicitly references sustainable development with its objectives including sustainable and inclusive socio-economic, gender equality, and food security, thus closely linking the AfCFTA with the SDGs and the Agenda 2063.¹⁹⁵

According to a modelling by the World Bank these measures will likely lead to a substantial increase in intercontinental trade. Intra-continental exports are expected to increase by over 81 %, exports to non-African countries increase by 19 % and the volume of total exports by almost 29 % by 2035 (relative to the baseline in 2020). Manufacturing exports would especially profit from the AfCFTA as the overall trade of manufacturing exports is expected to increase by 62 %, with intra-Africa trade increasing by 110 % and exports to the rest of the world by 46 percent. The volume of total imports is also expected to grow substantially, increasing by 41 % relative to the World Bank's baseline scenario for 2035. For intracontinental trade, imports from inside the region expand by 102 %, and imports from outside the region increase by 25 %.¹⁹⁶

With its focus on strengthening intra-African and the support of continental value chains and markets the AfCFTA offers great opportunities for the expansion and implementation of CE approaches in areas such as agriculture and agribusiness, mining, power generation, transportation, construction and many other

¹⁹⁰ European Commission (2020) [Questions and Answers: Towards a Comprehensive Strategy with Africa](#)

¹⁹¹ Trade and Law Centre (TRALAC) [Status of the AfCFTA ratification](#)

¹⁹² EU-Africa Partnership (2020) [African Continental Free Trade Area](#)

¹⁹³ World Bank Group (2020) [The African Continental Free Trade Area](#)

¹⁹⁴ African Union (n.d.) [Agreement Establishing the African Continental Free Trade Area](#)

¹⁹⁵ Kuhlmann & Agutu (2020) [The African Continental Free Trade Area: Toward A New Legal Model For Trade and Development](#)

¹⁹⁶ World Bank Group (2020) [The African Continental Free Trade Area](#)

African industries. However, as issues on environmental sustainability, green/ circular economy or sustainable consumption and production are not a focus in the current AfCFTA text, there is still potential to incorporate a clearer focus on circular economy in future negotiating rounds. This could for instance include specifications on the intra-continental trade of waste, secondary resources or plastics.

The EU's Generalised Scheme of Preferences

The EU's Generalised Scheme of Preferences (GSP) removes import duties from products coming into the EU market from vulnerable developing countries. This helps developing countries to alleviate poverty and create jobs based on international values and principles, including environmental protection, labour and human rights. The GSP Regulation entered into force on 1 January 2014 and is valid until 2023. The scheme offers three different preference arrangements¹⁹⁷:

- **Standard GSP** which removes custom duties on two third of tariff lines for low and lower-middle income countries;
- **GSP+** as a special incentive arrangement for sustainable development and good governance. Under GSP+ tariffs are reduced to 0% for vulnerable low and lower-middle income countries under the condition that they implement 27 international conventions related to human rights, labour rights, protection of the environment and good governance;
- **Everything But Arms (EBA)** as a special arrangement for least developed countries, providing them with duty-free, quota-free access for all products except arms and ammunition.

Although GSP scheme does not aim to support the transition towards a Circular Economy, it does aim to support sustainable development within the beneficiary countries. The GSP+ particularly incentivises adherence to environmental protection and mitigate social impacts. Furthermore, the increased exports and resulting economic growth, resulting from the GSP, could contribute to sustainable development. However, to achieve this the beneficiary countries need to have policies in place to effectively direct their resources to environmental policies and mitigation measures to limit any potentially detrimental effects of increased economic activity on the environment. This applies in particular to the most important import products under the GSP: textiles and clothing, as their production and trade tend to have a negative impact on the environment in the absence of adequate environmental and waste management mechanisms.¹⁹⁸

In case the GSP is continued beyond 2023, it might be possible to connect the GSP+ requirement to the adherence of certain CE-related aspects, thus incentivising a CE transition in the beneficiary countries.

3.4.2 Regional trade agreements

EU-Central Africa EPA

Of the Central African Countries, only Cameroon has concluded negotiations on an interim Economic Partnership Agreement with the EU. It is however designed to be a regional agreement open to any Central African country or group of countries interested in joining it. Under the EPA all goods from Cameroon can enter the EU duty and quota-free. On the other hand, Cameroon gradually removes duties and quotas over 15 years on 80% of EU exports to Cameroon. The EPA covers trade in goods, aid for trade, institutional issues and dispute settlement.

¹⁹⁷ European Commission (n.d.) [Generalised Scheme of Preferences](#)

¹⁹⁸ European Commission (2018) [Mid-Term Evaluation of the EU's Generalised Scheme of Preferences \(GSP\)](#)

Chapter 5 of the agreement highlights the commitment of all involved parties to ensure that sustainability considerations are reflected in all titles of the EPA and to draft specific chapters covering environmental and social issues. Apart from the vague statements in chapter 5 no further statements are made with regard to sustainable development, let alone circular economy.

As the interim EPA is a ‘stepping-stone’ agreement, the EU and partner countries can further deepen the agreement through ‘rendez-vous’ clauses which allow further negotiations on trade-related issues like services, competition, intellectual property, etc. In the future, this is likely to include negotiations on the implementation of a trade and sustainable development chapter. To support the CE in Central Africa these negotiations should aim to promote trade in environmental goods and services as well as cooperative initiatives on sustainable production and consumption or Circular Economy.

Interim Economic Partnership Agreement with Eastern and Southern Africa (ESA)

In 2009 six countries of the ESA¹⁹⁹ region signed an interim EPA with the EU. The Agreement is provisionally applied since 14 May 2012. Comoros signed the agreement in July 2017 and ratified it in January 2019. The EPA foresees consecutive rounds of liberalisation over 10 years and the tariff liberalisation process should conclude in 2022.

Although the interim EP does not address CE as such Article 49 of the agreement recognises the importance of cooperation in the sustainable management of natural resources and environment, including among other things the goal to develop new ESA industries related to the environment, the development of alternative environmentally friendly activities and products as well as the establishment of adequate waste management and disposal processes.²⁰⁰

To keep the possibility of further negotiating trade-related areas the interim EPA further includes a ‘rendez-vous’ clause (Article 53 of the EPA). These so-called “deepening” negotiations, which were requested in 2017 and initiated in 2019, include among others the integration of a chapter on trade and sustainable development. In preparation of the negotiations on trade and sustainable development the EU prepared a proposal for a legal text to be included in the EU-ESA5 deepening of interim agreement. In the proposal, the EU makes clear reference to strengthening circular approaches in cooperation on trade-related aspects of environmental policies and the implementation of measures such as:

- initiatives on sustainable production and consumption, including those aimed at promoting a circular economy and green growth and pollution abatement;
- initiatives to promote environmental goods and services, including by addressing related tariff and non-tariff barriers;
- the impact of environmental law and standards on trade and investment; or the impact of trade and investment law on the environment.²⁰¹

If included in the final agreement, these articles will provide a solid basis for future strengthening of CE-related aspects in trade and development cooperation between the EU and ESA countries.

¹⁹⁹ Comoros, Madagascar, Mauritius, Seychelles, Zambia and Zimbabwe.

²⁰⁰ European Commission (2009) [2012/196/EC Council Decision of 13 July 2009 on the signing and provisional application of the Interim Agreement establishing a framework for an Economic Partnership Agreement between the Eastern and Southern Africa States](#)

²⁰¹ European Commission (2020) [EU-ESA5: Trade and Sustainable Development: Initial text proposals tabled by EU](#)

EU-EAC EPA

The East African Community (Burundi, Kenya, Rwanda, Tanzania, and Uganda) finalised the negotiations for an Economic Partnership Agreement (EPA) with the EU on 16 October 2014. Kenya and Rwanda signed the EPA in September 2016, and Kenya has ratified it. For the EPA to enter into force, the three remaining EAC members need to sign and ratify the agreement. The EU-EAC EPA covers trade in goods and development cooperation. Apart from immediate duty-free quota-free access to the EU market for all EAC exports, it also contains a chapter on the sustainable use of resources in the area of fisheries as well as a chapter on agriculture geared towards sustainable agricultural development, including food security, rural development and poverty reduction in the EAC. Issues regarding CE or Sustainable Consumption and Production (SCP) are currently not addressed within the EPA. However, the agreement provides for further negotiations on services and trade-related rules in the future, offering the potential to include these issues in future negotiations.

EU-West Africa EPA

Negotiations on a regional EPA with the Economic Community of West African States (ECOWAS) and the West African Economic and Monetary Union, covering 16 countries, were concluded on 30 June 2014. To date all EU Member States and 15 West African Countries signed the EPA, leaving Nigeria the only country of West Africa that has not signed the EPA. Nigeria's reluctance to accede to the agreement may partly be due to the fact that in the case of West Africa, more than half of the region's exports to the EU are made up of mineral products (predominantly crude oil) from Nigeria. Only after signature by all the Parties, the agreement will be submitted for ratification.

The current EPA text does not feature the concept of circular economy nor sustainable consumption and production. References on the trade and management of waste are also not included. However, the EPA underlines the commitment of all involved parties to support efforts of the West African region with regard to the sustainable management of forests, fisheries and the emergence of modern agriculture. This included the facilitation of innovative forms of trade favourable to the preservation of natural resources (Article 3).

EU-SADC EPA

The Partnership agreement between the EU and the SADC EPA Group comprising Botswana, Lesotho, Mozambique, Namibia, South Africa and Eswatini (formerly Swaziland) was signed on 10 June 2016.²⁰² In February 2020, Angola applied to join. The agreement is the first regional EPA in Africa to be fully operational after Mozambique started applying the EPA in February 2018.

2018 was the first year of the full application of the EU-SADC EPA by all parties, after the agreement entered into provisional application for Mozambique on 4 February 2018. All SADC EPA countries have now started to implement the agreed cuts.

The EPA between the EU and SADC countries recognises the importance of cooperation on trade related aspects of environmental and labour policies (Article 11). This includes among others enhanced cooperation on corporate social responsibility and accountability, trade aspects of sustainable forest management and trade aspects of sustainable fishing practices. As most EUs post-2010 FTAs the SADC EPA also includes commitment of the Parties to Multilateral Environmental Agreements (notably the UN Framework Convention on Climate Change - UNFCCC), promotion of sustainable forest management,

²⁰² Angola has an option to join the agreement in future.

sustainable management of fish stock, and cooperation on liberalisation of environmental goods and services. However, CE as such is not yet featured within the Agreement.

During the sixth meeting of the EU-SADC EPA trade and development committee in February 2020 and in the context of implementation of the Trade and Sustainable Development Chapter, the EU made a presentation on the European Green Deal, the new EU's climate-friendly growth strategy, followed by an exchange of views between the Parties.²⁰³ As the EU's Green Deal is strongly committed to promote the circular economy, a future alignment of the SADC EPA with the Green Deal, and notably with the Circular Economy Action Plan, offers significant opportunities to further promote CE in SADC countries.

Box 3-1 Opportunities & barriers for strengthening CE-elements in trade agreement

The above mapping of trade agreements in Africa shows that the concept of circular economy is far from being a regular feature of (EU) FTAs and other relevant trade agreements. There are however indications that the concept is increasingly recognised and progressively integrated. In the following potential opportunities & Barriers for strengthening CE-elements in trade agreements are listed:

- Integration of circularity-pushing clauses in trade agreements can in principle have direct repercussions both in the EU and in trade partner countries. Significant opportunities for an integration of CE aspects are provided through the introduction of sustainable development provisions in EU trade agreements.
- So far, most of the references to sustainable development and sustainable production are only part of the TSD chapter or the Environment section. This indicates that sustainable development/ circular economy is still set only set out as pertaining to the environmental safeguards for trade rather than being considered an underlying imperative for the entire economy. Future agreement may therefore focus to integrate Circular Economy in a more holistic manner.
- To mainstream circularity aspects in existing or future trade agreements, it is recommended to integrate sector-specific principles and regulatory actions. This way the circular economy would be promoted at a sectoral level and beyond the purely environmental considerations of most agreements. This could include, for example, promoting trade in certain products and services within a sector (e.g., 'environmental goods and services' or CE-related products/services (such as products preventing waste or repair services...)) strengthening the regulatory frameworks linked to sector-specific trade (i.e., so-called trade 'flanking measures').
- Trade agreements have significant potential to incentivise the trade in environmental goods and services relevant to the circular economy (e.g., waste or secondary raw materials). However, although processing waste into secondary raw material can be important to developing countries' economies, weaker environmental regulations in the waste importing and processing countries can result in negative impacts for both workers and the environment. This is particularly the case with electronic waste (e-waste) exports to the developing countries. Future negotiations on trade agreements should therefore ensure that, a facilitation of trade is also backed by an appropriate political framework for environmental and labour protection. Additionally, the EU could aim to support the creation of legislative framework and appropriate capacity and skills in importing countries to limit and better manage waste imports as well as recycle imported waste more safely and efficiently.

Currently, the trade barriers in place linked to circular economy mainly impact waste exports from the EU to third countries. In particular, the absence of international waste quality standards currently creates significant barriers to trade and the development of an efficient - and sustainable - recycling economy in a global context.

²⁰³ European Commission (2020) [Joint Communiqué of the SIXTH MEETING OF THE EU-SADC EPA TRADE AND DEVELOPMENT COMMITTEE](#)

4 Impacts from shifting from a linear to a circular economy

4.1 Assessment of a CE transition in Africa through macro-economic modelling

4.1.1 Introduction

As the African economy moves away from a traditional linear economy towards a more circular economy, this will be expected to have economic, social and environmental impacts. The following subsections present the modelling results, highlighting the direction and magnitude of potential impacts of implementing a first set of circular economy measures across the African continent. This is done against the background of a CE transition in the EU (following the same assumptions as described in section 3.3)

Modelling approach

The modelling of the macro-economic impacts of the circular economy transition in Africa is carried out using Cambridge Econometrics' E3ME model. This is a global macro-econometric model that builds on a historical database of econometric data and projects forward annually until 2030, covering 43 sectors in Africa (for details see Annex C).

A conventional difference-to-baseline approach is followed. The circular economy (CE) scenario is compared against a baseline²⁰⁴ in which no explicit assumptions are made about circular economy activity (a 'business-as-usual' scenario, in other words), in order to compare outcomes between the two. The modelling looks at the period between the baseline year (2015) and 2030. The difference-to-baseline approach means that the results of the modelling exercise do not represent an absolute change between 2015 and 2030, but represent a change compared to what would have happened under baseline conditions.

The analysis uses an activity-based approach rather than a policy-based approach, which means that it focusses on the impact of the implementation of CE activities leading to structural economic change and does not assess potential impacts of specific policies but instead looks directly at the links between specific changes in an economy in comparison to business-as-usual trends and the direct, indirect and induced effects, without making any explicit assumptions about whether these changes are driven by policies, behavioural change or new technology or a combination of these.

Approach for Africa

The scenario assumptions used for the African economy are based on the modelling done for the 8 case study countries and expanded with the analysis of the African context as a continent. More details are provided in the next section on modelling inputs.

Approach for the EU

It is assumed that the circular economy transition in Africa happens alongside the circular economy transition in the EU. The scenario assumptions used for the EU economy are consistent with the ambitious scenario assumptions used in the analysis of the circular economy transition in the EU carried out in 2018 '[Impacts of circular economy policies on the labour market](#)'.

²⁰⁴ The baseline is E3ME's standard projection for African regions, based on official published economic and energy forecasts. See Annex C for more details.

Modelling inputs

The assumptions underpinning the CE scenario for Africa are informed by the case studies for 8 African countries as well as the analysis of Africa's context as continent. Based on our research on the trends in and opportunities for circular economy activities in the eight case study countries, five priority sectors have been chosen to be covered in the modelling exercise. Those are the waste sector, electronics, the plastics sector, the agri-food sector and the construction sector. Some of the circular economy activities that are currently commonly mentioned within the European policy and industry context were left out as these are not expected to be implemented in Africa within the coming decade (e.g., building design for de-construction or modular building design).

More specifically, the sectors of focus in the modelling exercise include the following:

- **Waste sector:** The waste sector is an important enabler of a (more) circular economy and to be effective in this waste collection rates and recycling rates need to increase;
- **Plastics sector:** Plastic (packaging) waste is a daunting problem in most African countries, a combination of more effective plastic waste collection and the recycling of plastic waste into new plastic packaging can make an important contribution to solving this urgent problem;
- **Electronics:** E-waste is another challenge in several African countries, but with proper and safe treatment practices in place it also represents an opportunity for reusing and remanufacturing, resulting in an increased supply of affordable EEE products as well as an opportunity for recycling of valuable materials present in the E-waste, when high-value CE strategies are not feasible;
- **Agri-food sector:** Agriculture is still a critical part of the economy in many African countries. In this sector, substantial potential resides in the improvement of handling, storage and distribution of food products to prevent losses and to increase the use of organic fertilisers;
- **Construction:** Construction is a booming activity in Africa, but up to now circular practices are virtually absent. Therefore, for the short-term there seems to be potential for increasing the use of secondary materials in this sector, either directly or via construction products that incorporate by-products or waste materials.

Where possible, the aforementioned sectoral narratives have been translated into modelling assumptions. It should be noted that the aim of the exercise is not to forecast the future in 2030, but to explore the impacts that more increased circularity could have by that year, were this to become a reality. To this end, evidence-based assumptions about the form and scale the circular economy could take across the African continent by 2030 have been made and used as exogenous inputs into the model. These model inputs are summarised in Table 4-1.

Table 4-1 Circular economy activities and corresponding modelling inputs

Category	Circular economy activity	Modelling input
Waste management	Improved waste collection rate	Increase in waste sector output
	Improved recycling of valuable materials in e-waste	Investment in recycling sector to improve health & safety standards (50% funded by industry, 50% funded through public/ODA financing)
Electronics		Exports of materials recovered from e-waste recycling
	Increased use of recycled materials in electronics production, replacing virgin metals and plastics	Shift in electronics intermediate demand: reduced purchases from metals and plastics sectors, replaced by purchases from recycling sector

Category	Circular economy activity	Modelling input
Agriculture	Prevention of food loss in agricultural supply chain through improved storage and logistics	Substitution of agricultural imports by domestic agricultural production
		Investment in storage and logistical capabilities (50% funded by industry, 50% funded through public/ODA financing)
	Increased use of organic fertilisers materials in agriculture, replacing use of mineral fertilisers	Shift in intermediate demand in agriculture: fewer purchases from chemicals, more purchases from agriculture
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 construction' intermediate demand: reduced purchases from non-metallic minerals sector, replaced by purchases from recycling sector

Modelling results

The modelling results presented here reflect differences between the CE scenario and the baseline by 2030, rather than the net effect of economic developments occurring between 2020 and 2030. For instance, if the price level in the CE scenario is reported as -1% by 2030, this does not imply that deflation occurred in the CE scenario, but that inflation was slightly lower in this scenario than in the baseline scenario.

4.1.2 Methodological and data limitations

The limitations to modelling circular economy activities mainly relate to data availability and quality, as well as other limitations to the scope of the results, and the ability of the modelling framework to reflect certain structural changes associated with the circular economy.

Sector classification in available IO tables: Analysis of certain key circular economy sectors in E3ME is made more difficult by the lack of sectoral resolution in input-output tables available for African regions. For example, the waste management sector is contained within a broader 'Miscellaneous Services' sector for African regions in E3ME. Instead, off-model data was used to estimate the size of the waste management sector in certain African regions and the size of the waste sector in Africa as a whole. Similar issues in accessing detailed economic data meant we were unable to model certain activities higher in the circular economy hierarchy, such as high-quality refurbishing.

Data on the informal sector: The informal sector is a key factor in the circular economy in Africa. This is particularly the case in agriculture, for instance, where much economic activity is carried out by subsistence and smallholder farmers. The E3ME model is built using data from a variety of official sources, such as the UN, ILO, and IEA. These data sources include estimates of the informal sector, although they remain estimates rather than measurements. The same uncertainty around the size of the informal sector is thus present in the modelling.

- **Structural changes within sectors:** The modelling framework does not account for certain structural impacts of the circular economy. For instance, if food losses are prevented in the agricultural supply chain, one would expect that the labour- and carbon-intensity of the agricultural supply chain would be reduced: output would be higher without the need for

greater labour or material inputs. The model does not consider the impact of these structural changes, hence results for employment and CO₂ impacts in the agricultural sector are likely overstated to some degree.

- **Carbon emissions:** The stated CO₂ impacts are also likely overestimated, because CO₂ emission savings only include emissions from energy use and from industrial processes, while other potential emission savings from the circular economy cannot be captured in the modelling framework, such as:
 - Changes to landfill and informal waste disposal emissions, which are likely to be reduced as a result of greater waste recycling and waste collection.
 - Reduced emissions from land-use;
 - CO₂ emissions embedded into materials;
 - CO₂ emissions outside of Africa, which can be expected to fall as a result of falling exports (i.e., falling African imports from the rest of the world).
- **Material inputs:** The model does not capture the impacts of circular economy activities on the use and depletion of raw materials in physical terms. While such changes can be inferred to some degree from changes in output in the relevant sectors (such as mining or forestry) in financial terms, these should only be considered as proxies rather than concrete projections of changes in material use in physical terms.
- **Other environmental and health impacts:** The model is not able to capture other environmental- and health-related benefits that might be expected to result from circular economy activity. For instance, we can expect plastic and chemical pollution to fall as a result of greater waste reduction and recycling, leading to an improvement in human and ecosystem health.

4.1.3 Economic impacts and benefits

The scenario results suggest that the circular economy could lead to positive GDP outcomes for the African continent as a whole. By 2030, Africa's combined GDP is projected to be around 2.2% higher in the circular economy scenario compared to the baseline. In other words, this suggests that the African economy could be larger as a result of increased circular economy activity across the continent than it would be in a 'business-as-usual' situation (baseline).

Table 4-2 shows the CE scenario results for each of the components of GDP, as well as for the price levels. Results for the CE scenario are presented as differences from the baseline scenario by 2030, in absolute (monetary) and relative (percentage) terms.

Table 4-2 Macro-economic impacts of the CE scenario

Variable	Absolute difference from baseline scenario by 2030 (€2019)	Relative difference from baseline scenario by 2030 (%)
GDP	+ €68bn	+ 2.2%
Consumer spending	+ €19bn	+ 1.0%
Investment	+ €7bn	+ 1.1%
Exports	+ €13bn	+ 1.5%
Imports	- €29bn	- 3.3%
Inflation	-	- 0.5%

The positive GDP effects are driven by a combination of higher consumer spending, higher investment and improvements in the balance of trade, which are in turn the result of structural economic changes associated with the circular economy.

The increase in investment expenditure is directly linked to circular economy activities, as it is assumed that greater investment would be required to achieve the prevention of food losses and increased recycling rates in the CE scenario. A reduction in demand for metals and plastics from higher recycling rates is compensated by demand for materials associated with the higher investment.

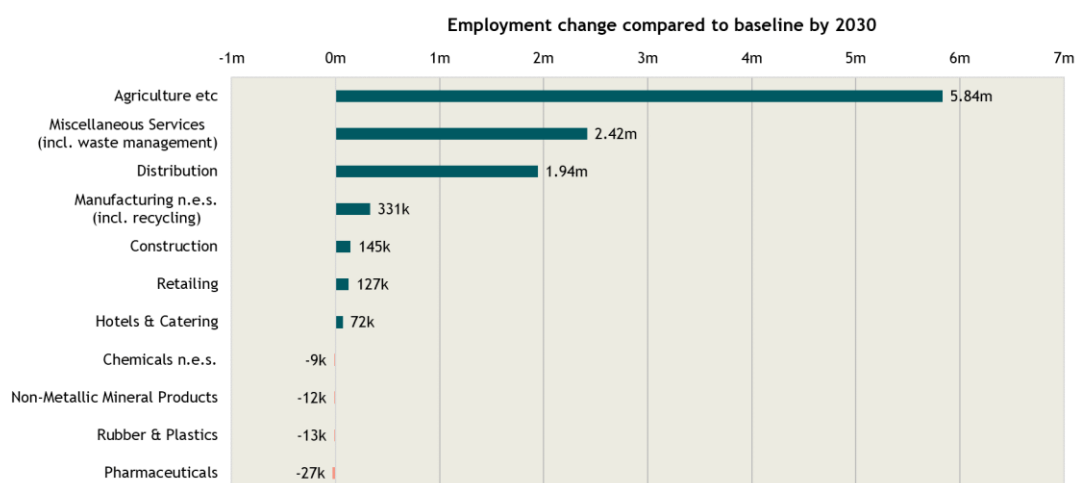
The reductions in food waste leads to lower food prices for consumers and thus higher demand, while at the same time the investments in recycling and waste collection lead to higher employment in these sectors. This leads to rising disposable income in the economy, which in turn drives higher levels of consumer expenditure.

The trade balance improves mainly because a) less food needs to be imported to Africa from elsewhere and b) tighter regulation and modern e-waste facilities leads to re-exports of (refurbished/recycled) e-waste.

4.1.4 Social impacts and benefits

In line with the projected positive economic effects, the scenario results suggest that the circular economy in Africa could also have positive employment effects. Overall, a net increase in employment relative to the baseline scenario of around 2.7% is projected, or approximately 11 m additional jobs in 2030 compared to the baseline.²⁰⁵ Provided that the right skill sets are being developed in the African workforce, these additional CE-related jobs could reduce the unemployment rate by 12% from 94 M²⁰⁶ to around 83 M. This is even higher than the projected net relative change in GDP in 2030, because many of the additional jobs are created in labour intensive sectors.

Figure 4-1 Absolute employment changes in CE scenario in most strongly impacted sectors (relative to the baseline)



²⁰⁵ These results account for estimates of the informal sector: see section 4.1.5 for details.

²⁰⁶ The unemployment projection under the business-as-usual scenario is calculated from labour force minus employment demand. Labour force is estimated from working age population multiply by participation rates. These participation rates are based on historical data which may exclude informal labour supply and changing trends such as increasing retirement age, higher education and increasing in female participation.

As shown in Figure 4-1, the biggest employment increases (in absolute terms) are in the agriculture sector, which benefits from better management of domestic food waste as well as the shift to organic materials away from inorganic inputs in farming, as well as the sector described as ‘miscellaneous services’ which includes the waste collection sector. Employment in distribution also increases, which is linked with improved logistics in agriculture and food distribution.

Additional jobs are also projected for the manufacturing sector, of which recycling activities form a part. While recycling is project to become less labour intensive with future automation, it remains a labour-intensive sector compared to many other sectors, explain the net positive change in employment for the manufacturing sector.

Employment changes in other sectors of the economy are mixed yet positive in net terms. Even if increased recycling leads to reduced demand for metals and plastics, these sectors, along with other manufacturing sectors, benefits from additional investment and consumer demand (i.e., induced demand) that comes with the circular economy transition. Employment in chemicals falls compared to the baseline from reduction in demand for fertilisers and pesticides.

A table with employment results for all sectors is included in Annex C.

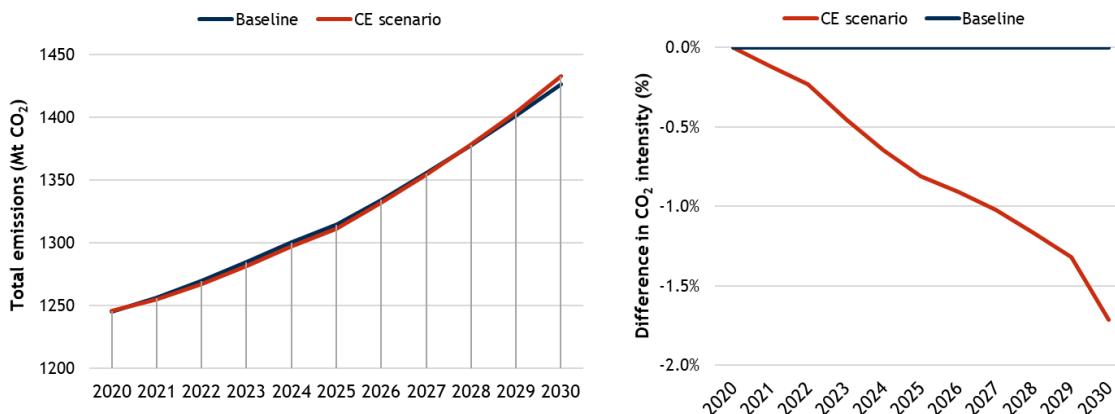
4.1.5 Environmental impacts and benefits

The circular economy can deliver several environmental- and health-related benefits. In this section, quantitative results for CO₂ emissions in the CE scenario and the baseline are presented, while other potential benefits for natural capital, health and biodiversity are discussed qualitatively in Section 4.2.3. This is because, for the time being, it is not possible to capture the full extent of environmental impacts at the scale of the African continent in the modelling framework used.

Overall, the modelling results suggest that the circular economy by itself (i.e., without further decarbonisation policies added to the baseline) can provide significant emissions reductions in key high emission economic sectors (chemicals, non-metallics²⁰⁷ or process emissions). It can lead to a decrease in the overall CO₂ intensity of GDP, despite a projected 0.43% (or 6.19 Mt CO₂) increase in annual net total emissions (with respect to the baseline by 2030, driven by higher energy use resulting from higher economic activity). The chart below, presents the CO₂ intensity of GDP, suggesting that per unit of economic growth, CO₂ emissions would be lower in the circular economy compared with the CO₂ emissions per unit of economic growth in the baseline scenario (reflecting a more linear economy).

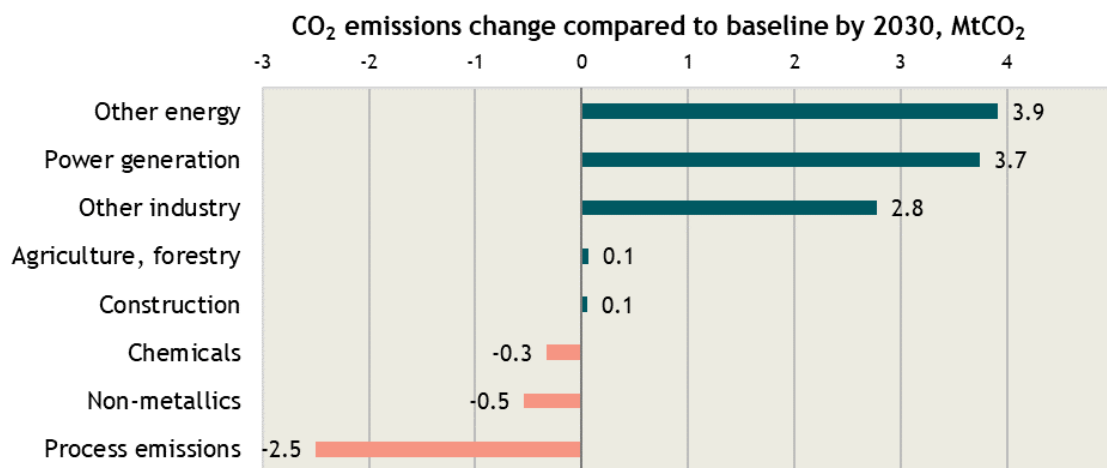
²⁰⁷ These include: cement, ceramics, glass, and lime.

Figure 4-2 Total CO2 emissions in the baseline and the CE scenario



The CE makes certain production processes and sectors of the economy less carbon-intensive, but - in the absence of other decarbonisation policies - the CE can also lead to higher emissions in other sectors due its positive effects on economic growth. This can be seen in the following figure, which shows that the CE is projected to lead to considerable emission reductions in the chemicals sector, the non-metallics sector and process emissions. However, without additional policies to decarbonise energy supply and power generation, or to improve energy efficiency, the net increase in economic activity could lead to higher emissions in other sectors because of energy-related CO₂ emissions and possible rebound effects from energy use (including power generation) and industrial activities, potentially outweighing the emission savings made in processes and sectors affected by CE activities.²⁰⁸

Figure 4-3 Absolute changes in CO2 emissions in CE scenario in most strongly impacted sectors (relative to the baseline)

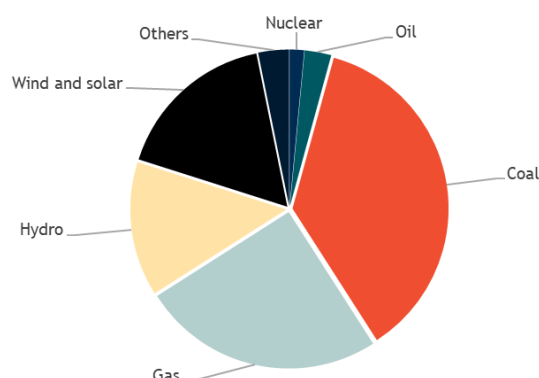


Significant benefits can thus be achieved by decarbonising the energy supply and power generation mix, alongside the circular economy transition. In the scenario simulations, no major changes to primary energy production nor the power sector generation mix have been assumed, as the objective of the analysis is to isolate the impact of the circular economy holding all else unchanged between the scenarios. In other words, the CE scenario which has been modelled assuming a conservative transition towards renewable energy supply in African countries. The following figure presents the 2030 power generation

²⁰⁸ For example, reducing food waste through improving logistic and increase in waste collection creates additional demand for transport and distribution. This in turn generates additional demand for fuels and electricity, leading to higher emissions from the power sector. Higher consumer demand also drives higher output from other industries not directly impacted by circular economy activities, generating greater emissions from those sectors.

mix projected in the CE scenario, which shows that a lot of the electricity is projected to be generated from coal, natural gas and oil.

Figure 4-4 Africa's power generation mix in the CE scenario (2030)



Other studies have already suggested that a more ambitious deployment of renewables is possible in the presence of action to decarbonise the economy, in particular the promotion and deployment of renewables and energy efficiency measures, alongside a transition towards a circular economy. In its *AFRICA 2030: Roadmap for a Renewable Energy Future*²⁰⁹, IRENA estimates that 49% of the power could potentially be generated from renewables by 2030, which is higher than the 31% projected in our CE scenario. Should this be the case, a further decoupling of the economic growth generated by the circular economy and CO₂ emissions is possible.

Finally, a key limitation to the analysis is that the modelling framework cannot capture the full GHG emission reduction potential of the circular economy, such as the GHG reductions from improvements to land use emissions and GHG emissions from waste (i.e., landfill emissions). Other research has shown that, while the waste production per head in African countries is lower than in developed countries, the waste is generally greater in biogenic carbon content and a larger share of the GHG emissions are produced by waste²¹⁰. This highlights the relative contribution better composting, treatment and disposal systems could make to reducing GHG emissions on the African continent, while it hasn't been possible to reflect this effect in the modelling for this study.

4.2 A qualitative reflection on the impacts of a shift to a more circular economy in Africa

This section reflects on the economic, social and environmental impacts of a transition to the CE from a qualitative point of view, to complement the impacts quantified in the modelling exercise.

4.2.1 Economic impacts

As the previous chapter showed, the shift to a (more) circular economy has a wide range of economic impacts, including structural changes in sector linkages, changes in the trade balance and economic growth. However, the circular economy also has several economic impacts that cannot easily be captured in a macro-economic modelling exercise. Therefore, we will shortly touch upon some of the most important impacts in the following paragraphs.

²⁰⁹ IRENA (2015) [Africa 2030: Roadmap for a Renewable Energy Future](#). IRENA, Abu Dhabi.

²¹⁰ Couth & Trois (2011) [Waste management activities and carbon emissions in Africa](#). *Waste Management* 31(1):131-7

One of the issues in Africa is that many countries are still very dependent on a very limited number of economic sectors, where agriculture is very important in most countries and extraction and export of specific resources is important for some. This low level of economic diversity is not good for the economic stability as fluctuations in international commodity prices affect such economies stronger than more diversified ones. Therefore, it comes as no surprise that **economic diversification** is high on the political agenda of many African countries. Circular economy can serve to give the economic diversification a direction as it helps to identify new and sustainable economic opportunities.

Although significant progress has been made in the last few decades, industry and manufacturing activities, especially related to products with a higher added value are underrepresented in the African economy, compared to other areas in the world. As a consequence, the product lifecycle stages occurring in African economies are mainly resource extraction, product consumption and the end-of-life stage, whereas the step which adds most economic value (manufacturing) is mostly lacking.²¹¹ This lack of a strong manufacturing base has several negative impacts, including low availability of manufacturing jobs, strong dependence on imports for a large number of (expensive) products and a missed opportunity for economic activity that generates a high added value. **Strengthening the manufacturing sector** in African economies and hence re-localising part of the global value chains to Africa requires multiple elements, including a better trained and more productive workforce²¹², increased investment and improved logistics and transport infrastructure. The circular economy can also contribute positively to the development of new manufacturing industries. A mind shift is needed, where waste is no longer seen only as a problem, but also as a source of valuable materials. As such, addressing the growing waste problem in Africa, through improved waste collection and sorting could turn into an economic opportunity whereby manufacturing industries gain access to cheap material resources.

The circular economy is a **new paradigm for shaping and structuring the economy**. This means that new economic opportunities will emerge in some sectors, while in other sectors activities may be reduced. In the long term, the extractive industries might see a reduced demand due to growing circular material use, although on the short term these effects will be compensated by the continued global demand for materials. However, on the long term it will be important that sectors that are expected to decline are addressed in the transition process, especially through reskilling of the workforce (see section 4.2.2).

African economies are still relatively poor in their **economic competitiveness**, which is due to a wide variety of factors. Many factors need to be improved in order to increase economic competitiveness, including improved theoretical and occupational education, improved and stable governance, more easy regulatory compliance, reduced bureaucracy, better infrastructure and improved access to finance. However, circular economy approaches can help to increase competitiveness from the bottom up, by making companies more resilient to supply shocks or fluctuations in international resource prices. Furthermore, new servitisation models can help companies to shift from a fluctuating sales model to a more stable income by providing products as a service via subscriptions. Furthermore, economic policy with a circular economy vision can help to steer economic development towards activities that are focused on the sustenance of natural capital and away from activities that exploit and exhaust natural capital, so that economic competitiveness and sustainable welfare creation can be maintained in the long run.

²¹¹ Lemille (2020) [A Vision for a Circular-Africa](#)

²¹² Signé (2018) [The potential of manufacturing and industrialization in Africa Trends, opportunities, and strategies](#)

4.2.2 Social impacts

Beyond the number of jobs which are projected to be created through the transition towards circular economy in various sectors, the **working conditions** of new and existing CE-related jobs are likely to improve as well. This is mainly due to increased transparency a circular model demands. Namely, to properly treat waste products in order to give them a second life, it is crucial to know e.g., which materials it contains, where they got sourced and/or produced and which processes were applied in their production. Being able to trace this information is also important for providing evidence for its circular virtue which are becoming increasingly important for customers but also import criteria. This will play in favour of eradicating the grey zone of ethical criteria like safe and just working conditions or the prevention of child labour along the value chain. For instance, EPR schemes can be used to improve the working conditions in the textiles or plastic sector whose value chains are relatively long and potentials high. The responsibility can be assigned to brands and producers or shared between different value chain stakeholders. To make sure that this is really penetrating to the workers, trainings in cooperatives, associations and companies offered by the producer responsibility organisation can help²¹³. Another example which is already happening is the formalisation and integration of the informal waste sector. Like the Mr Green recycling business in Kenya or the cooperative Attawafok in Morocco (introduced in chapter 2.2), the inclusive and collective approach of providing a stable income, insurance or work equipment and establishing relationships with other waste pickers, gives back dignity and respect to the waste pickers. The former example even offers additional benefits to its workers, such as the access to micro-loans. As the informal sector is contributing a tremendous part to the collection and sorting of the waste generated, justifies that the integration of the informal sector benefits workers, communities and organisations. Providing jobs with better working conditions could also lift communities out of poverty.

A related aspect to the way how companies and their production are operated is the effect on communities living in surrounded areas. By applying stricter environmental and health standards, replacing fossil fuels with renewable energies at the processes, and diminishing the production of waste, and notably hazardous waste, the level of pollution (air and water quality) affecting local communities can be minimised. This will inevitably increase their **life quality and health**.

The CE requires diverse skill sets ranging from simple and monotonous tasks to highly specialised. To be able to supply these skills, professional development measures, such as **trainings**, are necessary. Ideally this would be provided by associations affiliated by the respective industry, but also **educational programmes** through organisations like UNDP or programmes like SWITCH MED can help to support the skills development. If a higher skills and educational level can be achieved this would positively influence their labour value, the quality of work, while also empowering the workers in their abilities and independency, which might lead to entrepreneurial activities of developing or copying solutions.

4.2.3 Environmental impacts

Under the right circumstances, circular economy activities can contribute significantly to GHG reductions by reducing demand for products, increasing resource efficiency during production and use and reducing the emissions in the waste phase. Several studies have indicated that CE measures and policies can have a positive impact on GHG abatement,^{214,215,216} but in this study we were not able to show such effects, mostly due to methodological and data limitations (see section 4.1.5). In addition, there are other

²¹³ Ecopreneur (2020) [Research Note - Circular Fashion and Textile Producing Countries - A first inventory of the potential impacts of an EU circular fashion industry on non-European countries](#)

²¹⁴ Material Economics (2018) [The Circular Economy - a Powerful Force for Climate Mitigation](#)

²¹⁵ Ellen MacArthur Foundation (2019) [Completing the picture: How the Circular Economy tackles climate change.](#)

²¹⁶ EEA (2020) [Cutting greenhouse gas emissions through circular economy actions in the buildings sector](#)

important environmental benefits that can result from the transition to a circular economy, and which are not captured in the E3ME modelling framework used in this study. These benefits are numerous but can be grouped around two large areas namely pollution reduction and enhanced biodiversity and ecosystems as result of reduced resource use and waste and regenerative practices.

Africa's rich and diverse ecosystems are essential in providing for the continent's food, water, energy, health and secure livelihood needs. More than 62 per cent of the population depend directly on these services in rural areas, while the urban and peri-urban population supplement their incomes, as well as their energy, medicine and other essentials, from ecosystems-based resources.²¹⁷ Circular practices across agriculture, forestry and fishing, which protect natural habitats and forests, and prevent land conversion (for agriculture) through reduced food waste or diversified diets, all contribute to **biodiversity conservation**. The CE thereby minimises resource depletion and waste and environmental degradation.

The CE principles of reduce - reuse - recycle lead to a reduced resource use and waste generation whereby less waste would end up in landfills or being illegally dumped. This has on the one hand health benefits for the local communities in terms of **reduced air, water and soil pollution**. On the other hand, it also benefits terrestrial ecosystems. For example, the preservation and restoration of forest resources and less (plastic) waste being dumped in the environment, including rivers and the ocean, contribute to **healthier ecosystems** that in turn support biodiversity (e.g., healthy habitats for birds, fish stocks). Circular agriculture for example implies using minimal amounts of external inputs, closing nutrient loops and reducing negative discharges into the environment. Practices in circular agriculture such as organic manuring, crop rotation, cover cropping, and leguminous crops ensure increasing yields over many years and decreasing chances of future crop failures. These practices can lead to an extensive restoration of grasslands and biodiversity and can also contribute to stabilise climatic conditions and restore a balanced hydrological cycle. In addition, organic wastes (including food waste, crop stalks and stubble (stems), leaves, seed pods and animal waste) produced throughout farming activities can be converted into biofertilisers that add nutrients to the soil to facilitate plant growth, while enhancing **soil fertility**.

As such, the circular economy in Africa can support most of the Sustainable Development Goals (SDGs) including those on Zero Hunger (SDG 2), on Clean Water and Sanitation (SDG 6), on Life below Water (SDG 14) and on Life on Land (SDG 15). Furthermore, the most direct effect of the CE is of course its impact on resource efficiency (SDG 8) and sustainable consumption (SDG 12).

For environmental benefits of the CE to materialise, the environmental performance of different products and activities should always be considered by comparing the environmental impacts per functional unit (e.g., per m² living space or per person-km driven), which can be analysed through life cycle assessment studies. Additionally, what the best solution is from an environmental perspective, also depends on the (local) availability of different materials. For example, the sustainable use of timber as a construction material can bring environmental benefits compared to the use of more GHG emission-intensive products such as steel and concrete, but these benefits only materialise when the timber is sustainably sourced and does not aggravate deforestation leading to biodiversity loss and/or land degradation. Recently, Africa has been the continent with the highest deforestation rates in the world.²¹⁸

²¹⁷ IPBES (2018) [Summary for policymakers of the regional assessment report on biodiversity and ecosystem services for Africa of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services](#).

²¹⁸ FAO and UNEP (2020). [The State of the World's Forests 2020. Forests, biodiversity and people](#).

5 The Circular Economy in EU-Africa cooperation

Cooperative activities between Africa and the EU are diverse and range from dialogues on policy and regulatory frameworks to trade, development cooperation and joint research or industry initiatives. As both the EU and Africa become increasingly committed to develop a strategy that supports them in transitioning to a modern, resource-efficient and more competitive economy, cooperation on CE-related aspects is becoming increasingly important. The following sections explain the status of the cooperation between the EU and Africa on CE related issues, while addressing potential opportunities and barriers for boosting the circular economy in future EU-Africa cooperation.

5.1 Relevant continental, regional and trans-national platforms for policy dialogue on circular economy

The African continent has a vast untapped potential to adopt circular economy approaches and leapfrog to a low-emission and climate-resilient development model. However, an effective circular model for Africa requires coordinated, transnational policy efforts that foster green and circular innovations, create green jobs, seize local and cross-border market opportunities and increase economic diversification. To this regard, platforms that enable a constructive policy dialogue on an inter-continental, regional, and trans-national level play an increasingly important role in advancing the CE agenda. In the following, the most important platforms for CE-related policy dialogue between the EU and Africa respectively and between African countries are briefly presented.

5.1.1 African Platforms

African Union Specialized Technical Committee on Agriculture, Rural Development, Water and Environment (AU STC ARDWE)

The STC ARDWE is part of the African Union's Specialised Technical Committees (STCs), representing the main institutional ministerial setup at continental level. Each STC is composed of Member States' ministers and senior officials responsible for sectors falling within their respective areas of competence. The STC ARDWE focuses on reviewing strategic goals and identifying synergies and linkages, as well as implications for achieving the overarching goals of the Malabo Declaration on Accelerated Agricultural Growth and Transformation for Shared Prosperity and Improved Livelihoods (of June 2014); boosting the agenda for attaining food and nutrition security; reducing poverty; boosting intra-African trade as well as enhancing resilience to climate change, related shocks and disasters. It further serves as a framework for coordination and harmonization of the implementation of ongoing programmes related to the respective sectors.²¹⁹ To this regard the STC shows an increasing commitment to support Africa's transition towards CE. During its 3rd Ordinary Session in October 2019 the STC appealed to the AU Member States and Partners to support the implementation of the Draft Strategy for Environment, Climate Change, Water and Land Management Division (ECCWLM) 2019-2023 which among other things aims to establish a circular economy framework and ban single use plastics in 40% of African countries. It furthermore requested the African Union Commission to broaden the scope of plastic waste management on the continent by focusing on circular economy and its environmental and economic benefits.²²⁰

²¹⁹ African Union (2020) [Specialised Technical Committees](#)

²²⁰ African Union (2019) [Third Ordinary Session of the Specialized Technical Committee \(STC\) on Agriculture, Rural Development, Water and Environment](#)

African Ministerial Conference on the Environment (AMCEN)

The African Ministerial Conference on the Environment (AMCEN), established in December 1985, is mandated to provide advocacy for environmental protection and sustainable development in Africa.²²¹ The Conference brings together all 54 African governments as well as institutions and development partners to design policies aimed at addressing the continent's most pressing environmental issues. AMCEN provides direct input to the STC ARDWE. The Africa Office of the UNEP serves as the secretariat for the Conference. AMCEN's activities among others include:

- Providing continent-wide leadership by promoting awareness and consensus on global and regional environmental issues;
- Developing common positions to guide African representatives in negotiations for legally binding international environmental agreements;
- Promoting African participation in international dialogue on global issues of importance to Africa;
- Reviewing and monitoring environmental programmes at the regional, sub-regional and national levels;
- Providing regional strategic and policy guidance to promote sound environmental management for sustainable development;
- Promoting the ratification by African countries of multilateral environmental agreements relevant to the region;
- Building African capacity in the field of environmental management.

AMCEN holds its ordinary sessions once every two years. In addition, special sessions may be held if necessary. The 17th Ordinary Session of the AMCEN, which took place in Durban, in November 2019, called for the widespread adoption of the circular economy on the continent. To this regard AMCEN is committed to replicate, scale-up and use circular approaches as part of Africa's transformation efforts, in line with African Union "Agenda 2063", and to support the work of the ACEA. Following the ordinary sessions AMCEN also held its 8th special session, which took place virtually on the 4th of December 2020. During the session, AMCEN, among other things, welcomed the creation of an African Green Stimulus Programme (see 5.2.1), which was initially presented at the special session of the STC ARDWE in November 2020).

African Circular Economy Alliance²²²

Conceived at the World Economic Forum on Africa in Kigali in 2016, and launched at COP 23 in Bonn in 2017, the African Circular Economy Alliance (ACEA) was founded by Rwanda, Nigeria and South Africa along with UN Environment Programme and the World Economic Forum. The Alliance aims to spur the African transformation towards CE by: 1) Providing policy advice and disseminating best practices for the creation of legal and regulatory frameworks; 2) Scaling up CE business and projects by supporting partnerships within the individual or multiple countries for increased financing and designing circular economy projects; and 3) advocating for and raising awareness of the circular economy at a national, regional and global level with a goal to support new projects and partnerships within individual or multiple African countries.

In order to guide its future work, the ACEA has conducted an extensive market research on the African Circular Economy. Building on this market research, the Secretariat has just recently developed a work

²²¹ UNEP (n.d.) [African Ministerial Conference on the Environment](#)

²²² PACE (n.d.) [African Circular Economy Alliance](#)

plan for 2021, according to which the Alliance will focus its work mainly on 5 priority areas, namely: packaging, fashion & textiles, electronics, food systems and built environment. Within these priority areas, ACEA envisages to, among other things, facilitate seminars, trainings and workshops, identify technologies and business for incubation, establish national and regional partnerships on the circular economy, organize an African Circular Economy annual Event and initiate pilot projects in Member Countries.

To ensure greater participation of countries, the ACEA is actively aiming to reach out to potential member countries as part of its activities for 2021. The Alliance is also open to membership from national institutions and public sector entities, international organizations, funding institutions and research centres. Current member countries include: Governments of Cote d'Ivoire, Ghana, Nigeria, Rwanda and South Africa. Current strategic partners include: the African Development Bank, Africa Circular Economy Network, Global Environment Facility, Government of Finland, PACE, UN Environment Programme, the World Economic Forum, as well as the Konrad Adenauer Foundation. In contrast to similar organisations working on CE in Africa, the ACEA does not seek to enter into formal partnerships or membership agreements with private sector entities in the initial phase.

With this broad range of international members, the ACEA has a huge potential to serve as a platform to support the transition to a circular economy at the national, regional and continental levels. Its focus on public sector memberships positions it extremely well to function as a coordinating body that guides governments on the African continent in promoting CE policies and harmonizes cross-national activities. As the ACEA priority areas have a significant overlap with those of the EU Circular Economy Action Plan, the Alliance offers prospects for fruitful cooperation with the EU. Currently, the European Commission is exploring the possibility of joining the Alliance as a strategic partner. A membership would not only help expand and enhance the EU's cooperation with Africa on the circular economy (in line with the EU Circular Economy Action Plan's commitment to build a stronger partnership with the continent) but would also be an important step towards the development of a Global Alliance for Circular Economy and Resource Efficiency (GACERE), which is to be launched at UNEA-5 in February 2021.

African Circular Economy Network (ACEN)²²³

The African Circular Economy Network (ACEN) is a continent-wide membership-based initiative that aims to accelerate the transition to circularity in Africa. The network members consist of circular economy specialists with the expertise required to support the transition to more circular approaches to business. ACEN currently has representatives in 32 African countries.²²⁴

ACEN is among other things active in sharing and disseminating CE-related knowledge, raising awareness and offering training courses and workshops. In cooperation with the Government of South Africa and the European Union, ACEN furthermore co-organised one of Africa's first circular economy events, the "South Africa - EU Dialogue on Sustainability Transition: The Role of the Circular Economy" in Durban, South Africa, in 2017. To follow up on this event ACEN - in partnership with other leading organisations in the field as well as governments and programs - is currently organising "African Circular" the 1st Pan-African Conference on the Circular Economy, scheduled to take place in 2021 in Nairobi, Kenya.

²²³ ACEN (n.d.) [Welcome to The African Circular Economy Network](#)

²²⁴ ACEN (n.d.) [ACEN Representatives](#)

African Union Expert Group on Circular Economy

The recently established Experts Working Group on Circular Economy and Waste Management held its first meeting on 23rd October 2020. During the inaugural meeting the group members addressed the following topics:

- Elucidation of the relevance of Circular Economy in the continent;
- Generation of a roadmap for the development of the Circular Economy Action Plan for Africa;
- Promotion of partnership building for supporting the implementation of the African Circular Economy Action Plan;
- Development of the African Circular Economy Action Plan.

The meeting was attended by delegations from the Regional Economic Communities (RECs), African Ministerial Conference on Environment (AMCEN), African Union Commission (AUC), African Development Bank (AfDB), United Nations Agencies (UNEP and UNDP), Development Partners (European Union Delegation to the African Union (EUDAU), and United States Mission to the AU) and the Civil Society Group Pan-African Climate Justice Alliance.

With its clear focus on Africa transition towards a Circular Economy and the diverse range of regional and international stakeholders the AU Expert Groups is a promising entry point for future Africa-EU dialogue on CE-related issues.

5.1.2 Global Dialogue Platforms

Platform for Accelerating the Circular Economy²²⁵

The Platform for Accelerating the Circular Economy (PACE) is a public-private collaboration platform for leaders and their organizations aiming to accelerate collective action towards the Circular Economy. PACE was launched in 2017 by the World Economic Forum and is currently hosted by the World Resources Institute. PACE provides leaders with the connections, learning, and opportunities to pilot and rapidly scale best practices that drive the transition to a circular economy.²²⁶ The PACE community consists of 80 public, private, international and civil society executive leaders and over 200 members committed to driving the transition to CE, working together to overcome specific barriers to progress, test new initiatives and scale best practices to maximize impact.²²⁷ It is currently active in Asia, Africa, Latin America and Europe.²²⁸ The European Commission is one of the major donors of the WRI and in the future may continue to support the activities of PACE by providing financial support. PACE has recently developed a Circular Economy Action Agenda²²⁹ around food, electronics, textile, plastics and capital equipment, that provide a useful source of inspiration for concrete actions in promoting CE in these sectors, including in Africa.

Global Network for Resource Efficient and Cleaner Production²³⁰

The Global Network for Resource Efficient and Cleaner Production in Developing and Transition Countries, also known under the abbreviation RECPnet, was launched in 2011 during the inaugural Members Assembly of RECPnet in Nairobi. The network aims to bring together RECP service providers on a regional and global

²²⁵ PACE (n.d.) [Platform for Accelerating the Circular Economy](#)

²²⁶ World Resources Institute (n.d.) [Platform for Accelerating the Circular Economy](#)

²²⁷ PACE (n.d.) [Members](#).

²²⁸ World Economic Forum (n.d.) [Circular Economy and Material Value Chains](#)

²²⁹ [PACE](#) (2018)

²³⁰ [RECPnet](#) (n.d.)

level to advance the widespread application of RECP in transition and developing economies and currently comprises 70 members, with several representative entities from Africa and the EU.²³¹

World Circular Economy Forum²³²

The World Circular Economy Forum (WCEF) is a global initiative launched by the Government of Finland and the Finnish Innovation Fund Sitra. Forum partners include organisations such as the European Commission, the Ellen MacArthur Foundation, the Government of Finland, the Organisation for Economic Co-operation and Development (OECD) and the United Nations Environment Programme (UNEP). The WCEF brings together over 4,000 business leaders, policymakers and experts from around the world to jointly discuss and advance the world's best circular economy solutions. The Forum holds an annual main event during which current CE-related issues are discussed in a mix of plenary and parallel sessions as well as keynote speeches, thematic discussions and networking opportunities. To respond to the restrictions imposed following the global COVID-19 pandemic the most recent WCEF on 29 and 30 September 2020 was organised as a virtual event. The event focused on how the circular economy can help reboot the economy and shared useful tools and solutions with the world for a sustainable recovery. As part of the forum, the ACEA organized a high-level session on fostering inclusivity and circularity in Africa's post COVID-19 recovery. During the sessions a diverse group of panellists²³³ discussed promising circular initiatives on the continent, such as the EU-funded SWITCH Africa Green Programme (see **Error! Reference source not found.**) and the future role of the ACEA in facilitating Africa's transition towards a CE. The next annual WCEF will be held for the first time in North America in Toronto, Canada on 13-15 September 2021. Prior to that Sitra will also co-host a high-level meeting to address the connection between the circular economy and climate with the Ministry of the Environment and the Ministry of Foreign Affairs of the Netherlands on 15 April 2021. These and future fora beyond 2021 offer a great opportunity to further deepen the political dialogue on CE between the EU and Africa, embed it in the global context, and thus promote the development of a global Circular Economy Alliance.

5.1.3 EU-Africa Dialogue Platforms

Africa-EU Partnership, Joint Strategy & Comprehensive Strategy

The Africa-EU Partnership is the formal political channel through which the European Union (EU) and the African continent work together, engage in political and policy dialogues and define their cooperative relationship. It was established in 2000 at the first Africa-EU Summit in Cairo. Its actions are guided through the Joint Africa-EU Strategy (JAES), which was adopted by the Leaders of 27 European and 54 African States as well as the Presidents of the continental Institutions at the Lisbon Summit in 2007. The strategy provides the overarching long-term framework for Africa-EU cooperation. At the 5th AU-EU Summit held on 29-30 November 2017 in Abidjan, Côte d'Ivoire, which was held under the central theme of 'Investing in Youth for a Sustainable Future', EU and African leaders defined four joint priorities for the cooperation in 2018 and beyond²³⁴:

- Investing in people - education, science, technology and skills development;
- Strengthening Resilience, Peace, Security and Governance;
- Migration and mobility;
- Mobilising Investments for African structural and sustainable transformation.

²³¹ RECPnet (n.d.) [RECPnet Brochure](#)

²³² AFDB (2020) [World Circular Economy Forum: partners, leading experts discuss Africa's post COVID-19 sustainable recovery](#)

²³³ AFDB (2020) [Fostering Inclusivity with Circularity in Africa's post COVID-19 Recovery](#)

²³⁴ Africa-EU Partnership (2017) [5TH AU-EU SUMMIT](#)

Among the priorities is the progressive attraction of responsible and sustainable investments, unlocking the potentials of the digital economy, the support of intra-African trade, creating environmental resilience, climate change mitigation and the promotion of sustainable resources management. The concept of CE as such was currently not addressed specifically within the JAES.

However, as part of the ECs Work Programme 2020, Commission's President Ursula Von Der Leyen announced that "the Commission and the High Representative will develop a new comprehensive strategy with Africa to boost economic relations, create jobs in both continents and deepen our partnership across the board". To achieve this the EU proposes to build five partnerships, including, among others, a dedicated partnership for green transition and energy access. A key feature of these partnerships is the cooperation between the EU and Africa in the field of circular and blue economy, as well as the joint support of a responsible raw materials sector and the creation of safe and clean industrial supply chains²³⁵. In June 2020, the Council of the European Union formally adopted the proposed priority areas of the communication through dedicated Council Conclusions.²³⁶ Integrating these targets into a future EU-Africa Development Strategy offers significant potential to leapfrog CE-approaches and CE-related development cooperation within Africa.

African Union-European Union Summit

Initiated at the start of turn of the millennium, the AU-EU Summit is the highest profile conference between the AU and the EU, featuring the heads of states and government of Member States of the AU and EU. The first AU-EU Summit was held in Cairo under the aegis of the Organisation of African Unity at the time and has since been carried out every three years, with hosting countries alternating between the AU and EU each time.²³⁷ The next summit will take in place in 2021, as the originally planned 2020 Summit had to be postponed due to the COVID-19 pandemic. The 2021 summit will represent a milestone for the future AU-EU cooperation, as it is to endorse the new EU-AU strategy and pave the way for the post-Cotonou partnership of the AU and the EU.²³⁸ Furthermore, for the multilateral progression of CE, the 2021 summit gives the involved parties a chance to expand on the joint strategic priority area "mobilising investments for African structural transformation" of the 2017 declaration. This priority area foresaw the advancement of the circular economy, however arrangements were not explored in depth and remained as a single topical theme under the pretence of furthering sustainable development.²³⁹ A Europe-Africa Business Forum is expected to be held back-to-back with the 2021 summit (see section 5.4).

Sectoral EU-AU Thematic Task Forces

4 thematic EU-AU sectoral task forces were created in recent years to support EU-Africa policy dialogue in priority sectors: a Task Force Rural Africa²⁴⁰, an EU-Africa High Level Platform on Sustainable Energy Investments²⁴¹, a Digital Economy Task Force²⁴², and an Africa-Europe Transport and connectivity Taskforce.²⁴³ They are not necessarily relevant for CE, but provide an interesting example of EU-Africa dialogue platforms.

²³⁵ European Commission (2020) [Towards a comprehensive Strategy with Africa](#)

²³⁶ European Commission (2020) [Africa - Council conclusions \(30 June 2020\)](#)

²³⁷ Africa-EU Partnership (n.d.) [Africa-EU Summit](#)

²³⁸ ISS (2020) [Relations between Africa and Europe](#)

²³⁹ AU-EU (2017) [Investing in Youth for Accelerated Inclusive Growth and Sustainable Development.](#)

²⁴⁰ European Commission (2019) [Strengthening the EU-Africa partnership](#)

²⁴¹ European Commission (2020) [High Level Platform on Sustainable Energy Investments](#)

²⁴² African Union (2019) [Africa-Europe Alliance: The Digital Economy Task Force presents its final recommendations](#)

²⁴³ European Commission (2020) [Africa-Europa Alliance : Better transport and mobility between Africa and the European Union](#)

Box 5-1 Opportunities & barriers for strengthening policy dialogue on circular economy

- The large number of dedicated platforms for high-level policy dialogue between Africa and the EU offers great potential to advance the CE agenda on a continental level. However, as circular economy is an overarching concept, it is important to further expand the concept into a broader range of continental policy dialogues and frameworks, not necessarily limited to areas such as sustainability or green economy. In this respect, the development of the African Circular Economy Action Plan, as envisaged by the AU, is an important step towards streamlining the concept at continental level. The extensive expertise already available in the various platforms described above should definitely be taken into account when developing the plan.
- Despite the increased frequency of CE-related policy dialogue between the EU and Africa, legal and regulatory frameworks required to foster circularity are still in their infancy in most African countries, with mechanisms to realise the transition towards green economies often not yet being in place. Future CE policy dialogue should therefore increasingly focus on the implementation of the concept into already existing frameworks, for instance including the dialogue taken place at the level of the African Regional Economic Communities (RECs). To this regard it is also important that parties involved in the dialogue openly communicate their commitment as well as the corresponding aims.

5.2 Development cooperation and financing support for the circular economy in Africa

Development cooperation continues to be one of the most important aspects of the EU's engagement in Africa. This increasingly includes support for CE approaches within the continent. The following section provides an analysis and typology of ongoing CE-related development cooperation between EU/EU-MS and Africa (including existing EU DFI financing programmes of CE-related programmes/ projects in Africa) which operate at a continental, regional and transnational level. The identified programmes are evaluated according to how they contributed to a CE transition within the continent and what further potential they offer.

5.2.1 Programmes and instruments that will frame EU-Africa Development Cooperation on CE EU Instrument for the Neighbourhood, Development and International Cooperation

On 14 June 2018, the EC published the Proposal for a Regulation of the European Parliament and of the Council establishing the Neighbourhood, Development and International Cooperation Instrument (NDICI). The full negotiating mandate of the NDICI was agreed upon by European Parliament and the EU MS on 18 September 2020. With an overall allocation of €79.5 billion, the new instrument will cover the EUs cooperation with all third countries for the period of 2021-2027. The total allocation will be divided as follows²⁴⁴:

- €60.38 billion for geographic programmes (at least €19.32 billion for the Neighbourhood, at least €29.18 billion for Sub-Saharan Africa, €8.48 billion for Asia and the Pacific, and Americas and the Caribbean, €3.39 billion);
- €6.36 billion for thematic programmes (Human Rights and Democracy, Civil Society Organisations, Peace, Stability and Peace Conflict Prevention and Global Challenges);
- €3.18 billion for rapid response actions.

²⁴⁴ European Commission (2020) [Agreement of NDICI](#)

As the NDICI is guided by the principles of the EU Green Deal, which has recognised Circular Economy as a key programmatic area as part of its external dimension, the currently ongoing development of the NDICI programming is expected to continue to support African countries in transitioning towards a circular economy both as an opportunity and a tool to achieve a sustainable and inclusive development.

Pan-African Programme

Set up in 2014, the Pan-African programme is the first EU development and cooperation programme that covers all of Africa. The programme supports trans-regional, continental and global actions, providing new opportunities for collaboration between Africa and the EU. It was funded under the Development Cooperation Instrument with a budget of €845 million for the period 2014-2020. Since 2018 it has focused on key areas of:

- political dialogue and pan-African governance;
- education and skills, research and technology;
- continental economic integration.

One of the key benefits of the Program is its potential to foster development cooperation projects and programmes on cross-regional, continental or global dimension in areas ranging from sustainable agriculture and environment to higher education, ICT and research.²⁴⁵

Although the Pan-African Program addresses some key aspects of sustainable development, it did not include a reference to supporting the transition to a green/circular economy in Africa, nor did it focused on promoting specifically sustainable consumption or production. Potential successor programs should therefore build on the lessons learned and complement them with a clearer commitment to CE on the African continent.

African Green Stimulus Programme

The African Green Stimulus Programme (AGSP) is an AU-led initiative to support the Continent's recovery response in a sustainable manner to the devastating socio-economic and environmental impacts of the COVID-19 Pandemic. The AGSP aims to mobilise additional financial and technical resources to upscale and enhance the implementation of the portfolio of programmes within 12 Key Priority areas, whilst identifying areas requiring new interventions to support Africa's Green Recovery. As part of its 12 priority areas the Programme specifically aims to "Improve Chemicals and Waste Management and the Circular Economy" in Africa by scaling up investments in Circular Economy Programmes at national, sub-regional and regional level. In this respect, the Africa-led initiative would certainly benefit from EU financial support. The AGSP is expected to be adopted at the AU assembly Summit in February 2021.²⁴⁶

5.2.2 Trans-National Development Cooperation Projects on Circular Economy

Switch Africa Green

The SWITCH Africa Green (SAG) programme was developed and is funded by the European Union. It is implemented by the United Nations Environment Programme (UNEP) in partnership with European Union delegations in participating countries. The overall objective of SAG is to support African countries to achieve sustainable development by engaging in the transition towards an inclusive green economy, based on sustainable consumption and production (SCP) patterns, while generating growth, creating decent jobs

²⁴⁵ European Commission (2018) [Pan-African Programme - Multi Annual Indicative Programme \(MIP\) 2018-2020](#)

²⁴⁶ Department of Environment, Forestry & Fisheries South Africa (2020) [Speech delivered by Minister Creecy at the 8th special session of the African Ministerial Conference on the Environment](#)

and reducing poverty. To achieve these goals, SAG provides policy support, strengthens green businesses and facilitates knowledge transfer, while focusing on four priority sectors, identified to have a high potential for advancing the green economy and SCP: agriculture, manufacturing, integrated waste management and tourism. Within the priority sectors, specific actions address five cross-cutting themes: energy efficiency, labelling and standards, water efficiency, eco-innovation and sustainable trade.

Working with partners in the public and private sectors the program is currently active in seven African countries: Burkina Faso, Ethiopia, Ghana, Kenya, Mauritius, South Africa and Uganda. Based on its specific national circumstances and opportunities and following country-level consultations with key stakeholders, each country selects which of the four sectors it wishes to prioritize for its SAG interventions.

At country level, the program is implemented through three components which are designed to reinforce each other. The **policy support component** is implemented by the United Nations Environment Programme (UN Environment) and specifically aims to create the enabling conditions (e.g., policies, laws and regulations, standards, financing and access to technology and public procurement procedures) for a green economy and sustainable consumption and production, building on and scaling up existing activities. Under the component, SAG provides technical support for the selected priority sectors. This also included regular policy dialogue events on CE and SCP on a national level.²⁴⁷

The **green business development component** focuses specifically on providing micro-, small and medium-sized enterprises (MSMEs) with the training, funding and equipment necessary for greening their business ventures, with an emphasis on SWITCH Africa Green's five thematic cross-cutting areas. Since 2018, the Green Business Development component is implemented by the EU Delegations with support from DG INTPA, guided by a national technical coordination committee. The component is mainly implemented via grants awarded to projects that enable MSMEs to start or develop green/ circular businesses or switch over to more SCP practices.

SAG's third component is the **networking facility (also implemented by UN Environment)**, aiming to manage the knowledge generated by SWITCH Africa Green and to facilitate the exchange of information and best practices, both within the programme and in relation to other related programmes, projects and initiatives at the national, regional and global levels. SAG is currently also involved in the development of an African Circular Economy Action Plan. Although information on the Action Plan is still scarce, a first draft is expected to be published by the end of 2021. To this regard, a further alignment of SAG activities and focus areas with the already existing EU Circular Economy Action Plan is to be expected and promises to benefit the promotion of the CE Agenda on the continent.

SwitchMediterranean ²⁴⁸

SwitchMed was launched in 2013 to speed up the shift to sustainable consumption and production patterns in the Southern Mediterranean, notably through the promotion of circular economy approaches. The programme aims at achieving productive, circular and sharing economies in the Mediterranean by changing the way goods and services are consumed and produced so that human development is decoupled from environmental degradation. The Initiative is funded by the European Union (EUR 16,08 million of 18 million) and implemented by the United Nations Industrial Development Organization (UNIDO), the United Nations Environment Programme (UNEP) Economy Division, the United Nations

²⁴⁷ Switch Africa Green (2020) [Events](#)

²⁴⁸ SwitchMed (n.d.) [Switching to a circular economy in the Mediterranean](#)

Environment Programme Mediterranean Action Plan (UNEP/MAP) and its Regional Activity Centre for Sustainable Consumption and Production (SCP/RAC).

Four of the eight countries where SwitchMed is active are located in north Africa, namely: Algeria, Egypt, Morocco, and Tunisia. SwitchMed activities within all countries are strongly aligned with the Circular Economy Action Plan of the European Commission and focus on sectors with a high potential for CE-approaches such as plastics, textiles and food. Phase 1 of the program (2013 - 2018) was divided in three components addressing different parts of the transition process to sustainable consumption and production:

- Policy: development of a regional SCP action plan (SCP-NAP) for the Mediterranean and eight SCP national action plans;
- Demonstration activities: link the policy component and the private sector (cleaner production);
- Networking and communication: exchange of good practices, joint learning and scaling up.

As a result of phase 1 SwitchMed among others developed eight SCP National Action Plans (SCP-NAPs), supported the foundation of over 200 green businesses, and implemented 20 policy pilots. Building on the lessons learned from Phase 1, Phase 2 (2019 - 2022) is structured around:

- Direct support to the private sector (implemented by UNIDO and SCP/RAC);
- Creation of an enabling policy environment (implemented by UNEP and SCP/RAC);
- Coordination, networking and communication (implemented by UNIDO and SCP/RAC).

Phase II is expected to increase the number of green businesses activities, enhance competitiveness of the private sector through the adoption of resource efficiency production strategies, and support a policy environment that is beneficial for a green and circular economy in the southern Mediterranean countries. The extensive knowledge and lessons learned gathered as part of SwitchMed, offer a great opportunity to support circular business models and enabling policy frameworks across the entire African continent. To this regards especially the strong alignment with the EU Circular Economy Actions plan could support the AU in its efforts to establish an African Circular Economy Action Plan.

InTex

Launched in 2021, InTex is a three-year project funded by the European Commission (EC) aiming to promote innovative business practices and economic models in the textile value chain. Of the five project components, two have global reach while three components will focus on national implementation in three selected African countries. InTex will particularly focus on the science-business-policy interface to increase the understanding and the uptake of resource efficiency, circular approaches, life cycle thinking and eco-innovation by textile businesses (especially SMEs) and governments. The goal is to generate and enhance the access to science-based data on lifecycle environmental footprints of different business models including value retention processes, for evidence-based decision making. Early 2021, UNEP will decide in which African countries and together with which technical intermediaries the national project components will be carried out.²⁴⁹ As the textile sector is listed as a priority sector in both the EU CEAP as well as in the 2021 Workplan of the ACEA (see 5.1.1) InTex promises to offer useful inputs for future AU-EU cooperation on CE-issues.

²⁴⁹ UNEP (2020) [InTEX](#)

5.2.3 Trans-National EU DFI financing of CE-related programmes/ projects in Africa

Clean Oceans Initiative

The Clean Oceans Initiative (COI) was launched in October 2018 by the European Investment Bank together with the French and German development banks – Agence Française de Développement (AFD) and KfW. The initiative identifies projects that fight plastic waste in rivers, seas and on land. Its goal is to finance €2 billion in public and private sector projects that reduce plastic waste or the discharge of micro plastic by among other things:

- Improving the collection, treatment and recycling of waste, and the improvement of wastewater collection and treatment to keep plastics out of rivers, oceans and coastal areas;
- Enabling better waste management in ports and harbours to reduce plastic discharge from ships;
- Supporting innovative projects that keep plastics out of the oceans or lead to more reusable or biodegradable products.

Although the initiative is not featuring the CE-concept as such, its objectives with regard to waste management, collection and recycling show a significantly overlap with those of the CE Agenda.

Future COI project thus offer the opportunity to further improve the connection between plastic waste management and Circular economy, by increasingly targeting projects that aim to reduce plastic waste with circular approaches. This would also be in line with the EIBs commitment to support the transition towards a CE.²⁵⁰ COI already funded projects in several African Countries including South Africa, Benin, Togo and Egypt.²⁵¹

EU External Investment Plan and the Africa Investment Platform

To boost investments in Africa and the European Neighbourhood the EU, in 2017, adopted the External Investment Plan (EIP), which aimed to de-risk future investments and leverage match-funding together with financial institutions. At its core, the EIP aims to i) contribute to the achievement of the UN's Sustainable Development Goals (SDGs) while tackling the root causes of migration; and ii) mobilise and leverage public and private investments to improve economic and social development with a particular focus on decent job creation.²⁵² Key investment windows include:

- Sustainable energy and connectivity;
- Micro, Small and Medium-sized Enterprises (MSMEs) financing;
- Sustainable agriculture, rural entrepreneurs and agri-business;
- Sustainable cities;
- Digital for development.

Under the EIP the EU has already earmarked 4.6 billion EUR to the European Fund for Sustainable Development (EFSD), the plans key financing instrument, and seeks to leverage investments by an order of magnitude (i.e., 44 to 47 billion EU by 2020).^{253,254} The EFSD blended finance operations are composed of two regional investment platforms: The Neighbourhood Investment Platform (NIP, formerly the NIF) and the Africa Investment Platform (AIP, formerly the AfIF). The latter became operational in 2015, and particularly supports sustainable growth in Africa by promoting investment in areas with a positive impact on socio-economic development, including transportation, communication, water, and energy infrastructure, agriculture, and small-to-medium enterprises. The AIP finances projects in countries that

²⁵⁰ European Investment Bank (2020) [Circular Economy Overview](#)

²⁵¹ European Investment Bank (2020) [Clean Oceans Initiative](#)

²⁵² European Commission (n.d.) [Plan](#)

²⁵³ European Commission (2020) [EU External Investment Plan](#)

²⁵⁴ European Commission (n.d.) [Leaflet](#)

have signed up to the Cotonou Agreement by combining grants with other resources to leverage the impact of the support.²⁵⁵

As CE-financing has not yet become an explicit part of investment activities under the EIP/ AIP, advancing the deployment of CE-promoting financing instruments in close collaboration with African banking institutions, such as the AfDB, offers the opportunity for both the EU and the AU to mobilise significant investments from the private sector, while meeting the EU's investment targets in relation to the EFSD and accelerating the transition towards a CE both in Africa and the EU.

Box 5-2 Opportunities & Barriers for effective development cooperation/financing of CE Programmes

- The envisaged new comprehensive strategy with Africa is a good opportunity to pave the way for a development cooperation with a strong focus on supporting the transition towards a CE Economy in Africa. To this regard it might be beneficial to also define sector specific priorities, which would allow for a more targeted cooperation;
- With a total budget of €79.46 billion (of which €60.38 billion will be made available for geographic programming) the current programming phase of the EU instrument for the Neighbourhood, Development and International Cooperation (NDICI) for the period 2021-2027 offers a major opportunity to facilitate future CE-related Africa-EU development cooperation as well as for the economic recovery from Covid-19 of African partner countries. In this respect, the scale-up and complementation of existing regional CE-programs such as Switch to Green and SwitchMed is particularly promising. These projects have already led to many successful CE activities on the African continent, and the knowledge and lessons learned from these programs form a valuable basis for future EU-Africa development cooperation in the field of CE (i.e., future Switch programs). Additionally, multi-stakeholders approaches to support companies, particularly MSMEs, in developing circular, regenerative business models need to be supported both at country and regional level in Africa. In this context, the "Team Europe initiatives" currently being developed by the EU Delegations in Africa and the EU MS also play an important role.
- EU DFI financing of CE on a continental level in Africa is still mostly absent. However, the increasing Commitment of the EIB and other DFIs to finance the CE in Europe and activities such as the COI, already provide a solid basis for expanding CE-related finance activities. To this regard especially the cooperation with African Finance Institutions such as the AfDB, can be an opportunity to facilitate the investments not only in large scale projects, but also in smaller, innovative approaches, necessary to support the CE transition. The AfDB is currently establishing a dedicated African Circular Economy Facility (ACEF), a multi-donor trust fund that aims to support the adoption and diffusion of circular practices in Regional Member Countries. The ACEF particularly offers opportunities for future finance cooperation's with EU DFIs that want to support CE projects on the continent;²⁵⁶
- The increasing number of circular economy projects conducted in the EU as part of the EU Circular Economy Action Plan can provide guidelines for activities by the EIB and other DFIs. In this context, two particularly relevant mechanisms have already been developed: (1) The Circular City Funding Guide²⁵⁷ and; (2) InnovFin a successful Research & Innovation project that has already been tested in the EU market and could be of interest in the African Context.²⁵⁸

²⁵⁵ European Commission (n.d.) [Africa-EU Cooperation](#)

²⁵⁶ African Development Bank Group (2020) [Fostering Inclusivity with Circularity in Africa's post COVID-19 Recovery](#).

²⁵⁷ [Circular Funding Guide](#) (n.d.)

²⁵⁸ EIB (2020) [InnovFin - EU Finance for innovators](#)

5.3 Research and innovation cooperation on circular economy issues

The importance of strengthening the AU-EU relations in R&I was already recognised at the 3rd Africa-EU Summit in Tripoli, in 2010, in the course of which the AU-EU High Level Policy Dialogue (HLPD) on Science, Technology and Innovation (STI) was adopted as part of the JAES (see 5.2.1). Through the Roadmap 2014-2017, adopted at the EU-Africa Summit 2014, African and EU leaders continued to emphasise the vital role that STI plays in boosting employment, competitiveness and growth, human development, as well as in addressing pressing societal challenges. During the most recent AU-EU Summit of November 2017 it was furthermore stressed that there is the need for deepening R&I cooperation with a view to delivering on the first joint strategic priority for the following years: “Investing in people - education, science, technology and skills development”. To this regard joint R&I cooperation for a green/ circular transition is increasingly gaining traction. In the following section relevant CE-related R&I frameworks and partnership programmes for EU-AU cooperation are briefly presented.

5.3.1 Frameworks for EU-Africa R&I Cooperation

EU-Africa High Level Policy Dialogue on Science, Technology and Innovation

The EU-Africa HLPD on science, technology and innovation (STI) is the main platform coordinating regular exchanges on innovation and research policy. It strives to formulate long-term priorities to support the cooperation between Africa and the EU in the STI fields. It was established in 2010, as part of the Joint Africa-EU Strategy and is managed by both the EU and AU commissions as well as the respective member states of each union. The intensified cooperation efforts between EU and Africa have, amongst other successes, led to the adoption of the Roadmap for a jointly funded AU-EU research & innovation partnership on climate change and sustainable energy during the 4th Africa High Level Policy Dialogue on STI in 2017.²⁵⁹

Horizon 2020 & Horizon Europe

As one of the EU’s most ambitious research and innovation programmes Horizon 2020 (H2020) offers the central framework for R&I cooperation on CE issues between the EU and Africa. As part of H2020 the European Union has invested a total amount of EUR 123 million in African Union partners and it has already funded 310 projects under the programme. For the work programme 2018-2020 H2020 identified five major priorities, which are based on the overall policy priorities for the EU. The first among these priorities is the “Increased investment in sustainable development, climate related R&I and the European Green Deal for a fair and inclusive transition to sustainability”. A focus area of this priority is connecting economic and environmental gains through the transition to a CE. For this reason, nearly 1 billion from Horizon 2020’s final Work Programme will be invested into research, innovation and financing of projects and initiatives that support circular economy ambitions.²⁶⁰

In September 2020, H2020 launched the European Green Deal call, which is the last and largest call under H2020 to date, covering a total volume of €1 billion. With the Green Deal Call the Commission aims to respond to the climate crisis, provide more protection to Europe’s biodiversity and habitats under threat, and accelerate a sustainable recovery. As part of its 8 thematic areas the Call among other things wants

²⁵⁹ Africa-EU Partnership (n.d.) [EU-Africa High-Level Policy Dialogue \(HLPD\) on Science, Technology and Innovation \(STI\)](#)

²⁶⁰ European Commission (2018) [Horizon 2020 Work Programme 2018 - 2020](#)

to support the green transition and energy access partnership with Africa, thus offering a significant opportunity to provide funding for additional CE-related STI cooperation between Africa and the EU.²⁶¹ In 2021 H2020 will be replaced by the EU's new R&I framework programme Horizon Europe. As Horizon Europe is expected to continue the focus on CE research and innovation, it offers great potential for future Africa-EU cooperation on this level. To realise this potential, it will however be necessary to continue to increase the access to information about cooperation opportunities through H2020 and Horizon Europe and mitigate institutional weakness and the lack of experience of African stakeholders with regard to administrative, legal and financial aspects of EU-funded programmes. Furthermore, it is important to progressively involve industry partners in R&I cooperation and increase the visibility of successful CE-related research cooperation.

5.3.2 EU-Africa Research and Innovation Partnerships

Africa-Europe Innovation Partnership

The Africa-Europe Innovation Partnership (AEIP), launched in 2019, is funded by the European Commission and will run until May 2021. It aims to connect high-quality incubators, accelerators and technology transfer offices from both continents to explore opportunities for mutually beneficial partnerships resulting in collaboration, exchange and growth. Among the AEIP's activities are the facilitation of technology transfer to provide EU and African organisations with access to innovative technologies, the development of training modules on technology and finance for start-ups and entrepreneurs as well as the organisation of collaborative Innovation events in Africa and Europe.

In 2020 AEIP devoted the entire December to highlight Green Innovations and Partnerships. This included a wide range of webinars and networking events for actors involved in the green sector, which among other things were focusing on facilitating the development of partnerships between African and European organisations in order to apply to the EU's Green Deal Africa Call under H2020. Furthermore, the Partnership conducted a forum for business developers and programme managers from the EU and Africa seeking to enhance their knowledge on how to apply sustainable business model design patterns to an innovation challenge or a new business idea in the field of cleantech.²⁶²

R&I Partnership on Food and Nutrition Security and Sustainable Agriculture

Within the framework of the AU-EU High Level Policy Dialogue on Science, Technology and Innovation (see 5.1), embedded in the JAES (see 5.2), Africa and the EU agreed to intensify R&I cooperation in the area of Food, Nutrition Security and Sustainable Agriculture (FNSSA). The Roadmap for this partnership was adopted in April 2016 and is structured around four main pillars: (i) Sustainable intensification, (ii) Agriculture and food systems for nutrition, (iii) Expansion and improvement of agricultural markets and trade and (iv) Cross-cutting issues.²⁶³ Although the Partnership currently does not address the concept of CE as such, circular agricultural approaches have proven to be a feasible way to address food and nutrition. Future R&I activities within the framework of the FNSSA are therefore likely to implement CE as part of their activities. This is further underlined by the fact that during the first ever EU - AU Research & Innovation Ministers' Meeting on 16 July 2020, it was agreed that cross-cutting elements such as circular economy & digitalisation have to be included in both the FNSSA and the AU-EU partnership on climate change and sustainable energy.

²⁶¹ European Commission (2020) [Horizon 2020 European Green Deal Call](#)

²⁶² AEIP (2020) [AEIP's Green December to Remember](#)

²⁶³ European Commission (2019) [EU-Africa Research and Innovation Partnership on Food and Nutrition Security and Sustainable Agriculture](#)

Partnership for Research and Innovation in the Mediterranean Area

The Partnership for Research and Innovation in the Mediterranean Area (PRIMA) is a joint R&I programme for the Mediterranean basin. The main objective of the ten-year initiative (2018 - 2028), which is partly funded by EU's research and innovation programme Horizon 2020, is to devise new R&I approaches to improve water availability and sustainable agriculture production in a region heavily distressed by climate change, urbanisation and population growth. Of the 19 countries committed to the initiative, 4 are based in Africa, namely: Morocco, Egypt, Algeria, Tunisia.

As part of its Annual Work Plan 2020 PRIMA specifically aims among others to create opportunities towards the transition to the circular economy in the Mediterranean Area in line with the EU's Circular Economy EU package and Action Plan.²⁶⁴ As a result, CE will be one of the core aspects of the PRIMA Calls for 2020. As it is expected that the transition towards CE in the Mediterranean basin will remain a focus in future PRIMA calls as well, PRIMA offers significant opportunities to further expand R&I cooperation on CE issues between the EU and Africa in the future.

Box 5-3 Opportunities & Barriers for advancing research and innovation cooperation on circular economy issues

- Horizon 2020 and also Horizon Europe already provide a solid framework for strengthening research and innovation cooperation between the EU and Africa on circular economy. However, despite the increasing number of R&I cooperation in general, the level of joint CE-related R&I cooperation's between Africa and the EU is still relatively low. This may partly be due to the unequal access to information about cooperation opportunities through Horizon 2020 or the lack of experience of African R&I organizations with regard to the administrative, legal and financial aspects of EU-funded programs²⁶⁵. Therefore, opportunities for advancing future CE-related R&I cooperation also lie in increasing the access to and awareness for funding under H2020 and Horizon Europe.
- To further support CE-related R&I cooperation it is important to further improve the communication & coordination between the African scientific community and policy makers on a continental level. The EU-Africa High Level Policy Dialogue on Science, Technology and Innovation (see **Error! Reference source not found.**) provides an ideal platform for this.
- Although there are already a range of successful collaborative R&I projects that focus on CE, their visibility on the African Continent is still limited. An improved strategy for communication successful cooperation projects could not only inspire future research cooperation but also motivate industry partners to support these efforts.

5.4 Cooperation between African and EU companies with circular business models

Africa and the EU can look back on a long history of continental business-to-business (b2b) relations. With deepening economic integration, the rise of the CE promises the creation and development of new markets and may draw attention to opportunities that are yet unexplored. With the launch of the Africa - Europe Alliance for Sustainable Investment and Jobs in 2018, b2b relations of the two economies have become increasingly guided by investments into sustainable infrastructure, products and services. In light

²⁶⁴ PRIMA (2020) [Annual Work Plan 2020](#)

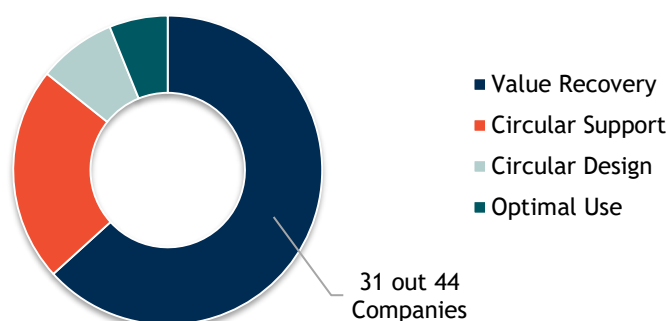
²⁶⁵ European Commission (2018) [Roadmap for EU African Union S&T cooperation](#)

of a new upcoming framework for Africa-EU cooperation as announced by the president of the European Commission, CE will become one of the core areas of multi- and bilateral business cooperation. According to the Circular Economy Guide of the EIB, which was released in May 2020²⁶⁶ and is based on the European Commission's (EC) 'Support to Circular Economy Financing Expert Group' report on "Categorisation System for the Circular Economy"²⁶⁷, circular businesses can be categorised into four distinct types, namely:

- Circular Design Models emphasise the development of existing or new products and processes that seek to optimise circularity, e.g., by developing long-lasting and repairable products, enabling upgrading of key components and/or manufacturing more resource-efficient items;
- Optimal Use Models seek to increase utility and value of a product during an extended life. Often, this implies that producers maintain ownership over the products whereas consumers acquire the right to use items over a fixed period of time (e.g., leasing, renting) in so-called product-service-systems (PSS);
- Value Recovery Models aim to maximise reuse, recycling and recovery rates in line with the waste hierarchy, e.g., by operating recycling plants or setting up reverse logistics systems. Thus, they are more or less in line with "traditional" waste management approaches;
- Lastly, Circular Support Models perform important auxiliary services with a focus on management and coordination of circularity networks, deployment of new technologies or promoting other businesses to become more circular.

As can be seen from Figure 5-1 below, most EU businesses active in Africa can be classified as Value Recovery Models and do not fully embrace Optimal Use Models or Circular Design Models. A smaller part of EU companies can be classified as Circular Support Service Models, although this appears to be driven mainly by the provision of consultancy services for enhanced waste management. It should be noted that within the limited scope of this study, this analysis is far from exhaustive and only based on a limited set of companies that have been identified in the process of reaching the eight country reports.²⁶⁸ More comprehensive analyses are currently unavailable and would deserve further research. Yet, it provides an initial starting point and is in line with the understanding of most stakeholders, which still view CE as a means to improve downstream value chains (i.e., waste management). A list and detailed classification are displayed in the Annex.

Figure 5-1 Analysis of European CE businesses activities in African case study countries based on EIB Circular Economy Typology



²⁶⁶ EIB (2020) [The EIB Circular Economy Guide: Supporting the circular transition](#)

²⁶⁷ Schempp & Hirsch (2020) [Categorisation system for the circular economy](#)

²⁶⁸ The analysed countries include Egypt, Morocco, Rwanda, Kenya, Ghana, Nigeria, Senegal and South Africa.

Apart from individual EU companies active on the African continent, there are a number of important platforms and associations that facilitate exchange between African and European businesses. Most notably, the 6th EU-Africa Business Forum (EABF) took place on November 27th, 2017 in Abidjan, Côte d'Ivoire under the overall theme of “Investing in Job Creation for Youth”.²⁶⁹ Subsequently and resulting from the call for the creation of a more permanent and structured forum for dialogue between African and EU actors, the Sustainable Business for Africa Platform (SB4A) was launched. Key focus areas of the EABF included sustainable energy, digital economy and agriculture and agri-business. The next EABF is scheduled to take place back-to-back with the upcoming AU-EU Summit in 2021 and will prominently feature CE as a core topic, encompassing among other things a panel discussion on CE and opportunities for CE-related B2B contacts, thus highlighting the growing importance of the topic for the economies' b2b relations.²⁷⁰

In 2017, the final declaration of the 6th EABF was issued by many prominent continental business organisation, such as BusinessEurope, Eurochambers, the European Business Council for Africa and the Mediterranean (EBCAM), European Entrepreneurs, Business Africa and the Pan-African Chamber of Commerce and Industry.²⁷¹ While the declaration does not refer to CE as a concept, it clearly highlights the need for more sustainable industrialisation, replication and scale-up of successful business ideas in line with the Sustainable Development Goals (SDGs) and emphasises the EIB's role in facilitating this process by means of investments. Given the openness of the declarations' signatories to SDGs, a stronger focus making progress towards SDG 12 (Sustainable Consumption and Production) and the role of CE therein appears to be an avenue that deserves further attention.

Finally, the EUs Circular Economy Missions²⁷² comprise of a series of high-level political and business meetings in third countries. The primary goal of the Missions is to increase the dialogue and cooperation between the EU and third countries in the field of environmental policy by signing political agreements directed at fostering the CE, green public procurement and innovative, sustainable and inclusive growth. Policies discussed during the missions concern circular economy, resource efficiency as well as the sustainable use of natural resources with a particular focus on eco-innovation, chemicals and plastic, waste, water management, marine pollution and urban environmental best practices. Past CE Missions in Africa have been conducted to Senegal (November 2019) and South Africa (May 2017). Due to the current covid pandemic three other mission to Nigeria, Ghana and Kenya, which were scheduled for 2020, were postponed.

Box 5-4 Opportunities & Barriers for advancing business cooperation between African and EU companies with circular business models

- Although the value-creation potential of circular business models has gained increasing attention in recent years, most EU businesses active in Africa are mainly active in a very narrow niche of CE and appear to focus on value recovery (i.e., waste collection, reuse, recycling and recovery). Given that the transition to CE is still in early stages in both the EU and Africa, this opens a host of opportunities to explore avenues of other neglected businesses models that emphasise circular design, optimal use and/or circular support services. The economic rationale of such models may not be immediately apparent but given the rising interest and strong public support for CE, businesses can secure first-mover advantages by developing, replicating and scaling innovative business ideas that cover the entire spectrum of CE.

²⁶⁹ EU-Africa (2017) [6th EU-Africa Business Forum: Highlights](#)

²⁷⁰ EU-Africa Business Forum (2020) [7th EU-Africa Business Forum](#)

²⁷¹ 6th EU-Africa Business Forum (2017) [Joint Business Declaration](#)

²⁷² European Commission (n.d.) [Circular Economy Missions to Third Countries](#)

- Moreover, with the upcoming 7th EU-Africa Business Forum (EABF) that will take place back-to-back with the AU-EU Summit in 2021, there is a clear opportunity for creating further momentum for CE-related cooperation between African and European businesses. Despite organising dedicated sessions on CE business opportunities and CE financing, hosting matchmaking events in the run-up to the EABF would prove useful. Moreover, a key opportunity and potentially impactful outcome of the EABF could mandate the SB4A to explicitly explore investment opportunities in the CE space. One option to facilitate this process by initiating a High-Level Platform on Circular Economy Investments in Africa (similar to the equivalent to the High-Level Platform on Sustainable Energy Investments or as a possible extension thereof).
- As companies are driven by profit interests and EU member states are heavily involved in their own business initiatives, platforms and associations and do not always coordinate with EU-based organizations, the EU's scope for promoting B2B cooperation between African and EU companies is rather limited. Nevertheless, activities such as the EU Circular Economy missions to African Countries (see 5.1.3), involving delegations of EU businesses, may present a good opportunity to increase EU-Africa B2B matchmaking.

6 Recommendations for boosting the CE through EU-Africa cooperation

This chapter provides continental level recommendations to facilitate the transition to the CE in Africa. The focus is on what the EU can do to improve Africa-EU CE cooperation on policy, trade, finance, research and business.

6.1 Policy cooperation

Due to the important trade and development relationships as well as the strong cooperation ambitions, there are several high-level policy dialogues between a number of African countries and the EU. However, neither of these are focussed on the CE, nor are well-coordinated. There is a need to structure, focus and formalise existing dialogues with tangible, aligned and implementable outcomes that bring the CE transition forward. Even if concrete measures promoting the CE uptake in Africa have so far mainly occur at national level, EC need to pursue policy dialogues both at national, regional and continental level, as all levels are complementary and can reinforce each other.

6.1.1 Developing a CE-dedicated policy dialogue platform / EU-AU Task Force on the continental level.

Beyond further expanding existing policy dialogues to CE topics and deepening the Commission involvement in African led CE initiatives (such as the ACEA and the AU experts Group on CE), the political conversation between Africa and the EU would profit from strategically aligning political initiatives. The development of one central policy dialogue platform in the form for example of an EU-AU Task Force on circular economy at the continental level, bringing together key stakeholders from the AU Commission, the European Commission as well as potentially experts from key national African governments (those involved in the ACEA for example), EU Member States and UN agencies most involved on CE in Africa in a systematic way and on a more institutionalised basis, could facilitate the conversation. It will also improve the feedback flows, align activities, reveal potential synergies and avoid running similar initiatives in parallel. Thus, it will ultimately strengthen and focus the EU-AU cooperation. Countries and regions where platforms and political collaborations between EU Delegations and EU Embassies on CE already exist, could feed their country-level work under such a new continental CE-dedicated policy dialogue platform/Task Force. Such a platform/Task Force could allow to build more synergies between African CE priorities, EU policies and regional EU-funded programmes (such as UNEP Programmes, SWITCH Africa Green as well as potential regional Team Europe Initiatives, for example) which would guide and enhance the policy dialogue as well as help to avoid duplications.

The process of setting up this CE-dedicated policy dialogue platform, would benefit from building on lessons learned from other already established EU-AU Task Forces²⁷³. Initially, it is crucial to clearly define the overall mandate under which the existing CE policy initiatives between the AU and EU shall be connected. This step should closely involve relevant AU and EU Commissions' services as well as major stakeholders which will ensure a common understanding of what the dialogue entails and aims to achieve. Subsequently, setting up thematic working streams under which working groups might draw more in-depth assessments e.g., for different CE sectors, can serve to structure both existing initiatives and the dialogue itself. These parts should ideally be manifested by a shared action plan and/or a roadmap which

²⁷³ Task Force Rural Africa (TFRA), EU-Africa High Level Platform on Sustainable Energy Investments (SEI Platform), Digital Economy Task Force (DETF) and Africa-Europe Alliance Transport Taskforce (AEATTF).

hold its stakeholders accountable by defining objectives and actions for increased cooperation between the EU and Africa. The operation of the dialogue needs strong and competent leadership through high-level chairs that manage the work and meetings. More concrete activities, such as coordination and gathering of inputs, can be realised by a core team of stakeholders. Lastly, a communication strategy might facilitate regular publications of outcomes, progress, agreements and findings which will further promote the dialogue and engage or simply inform interested stakeholders.

6.1.2 *The development of CE-specific policies and roadmaps*

There are existing national efforts that support the CE transition in African countries, however, these efforts are often not focused specifically on CE, but are instead mostly part of Sustainable Development or Green Growth strategies. Existing efforts have a strong focus on the waste sector, reduction in energy, materials and water consumption or using secondary raw material in the industrial production process, but there is still limited attention for CE business models that retain value at a higher level in the value chain (e.g., refurbish or remanufacturing strategies). Even though existing CE policies and strategies are insufficient to bring about an economy-wide CE transition, they can act as a starting point for the development of a holistic framework strategy on CE. Such a framework should have clear priorities, an implementation and investment plan, with further coordination, support and mainstreaming of CE between ministries and relevant stakeholders.

Like the EU, African countries need to lay down a solid foundation for a unified Circular Economy Action Plan (CEAP) that addresses the CE transition in the entire economy in a holistic manner and seeks to target distinct key product value chains according to life-cycle principles and based on the waste hierarchy. This should then be translated into the national context which enables to subsequently develop national CEAPs. A crucial step to do so is to execute ‘circularity scans’ on different levels (city, regional and/or national) which capture qualitative and quantitative information essential for the development for a national CEAP²⁷⁴. These information or data would include an overview of economic priority sectors, material flows, relevant stakeholder, existing ongoing CE initiatives and business models, national policies supporting CE, etc. The envisaged CEAPs should consider following elements:

- Encouragement of **(M)SMEs development and associated employment opportunities;**
- **Identification of key economic activity areas** in relation to the development of CE activities, including **tangible policies and actions for each of these sectors;**
- **Being developed with input from key stakeholders from the public and private sector** in the respective country;
- **Involving grass-roots movements** as well as **educational institutions;**
- Including clear responsibilities and milestones per value chain/stakeholder group;
- **Integration and harmonisation with the existing economic policy framework, priorities, and objectives;**
- Providing a **clear roadmap for all parties concerned**, signifying what role they have to play and what are the measurable milestones for the required transition to a sustainable economic system;
- **Involvement of all relevant Ministries in the drafting process**, so that the plan does not become a silo promoted by the Ministry of Environment, but a broadly supported strategy and vision for overall economic development. As such it is key that Ministries of Economic Affairs and Industry, as well as Ministries responsible for trade and the Ministry of Treasury are involved;

²⁷⁴ According to the interview with stakeholders from ACEN and Botswana’s Green Building Council on the 27/10/20.

- **Effective and practically implementable enforcement mechanisms as well as quantitative targets** need to be included in the action plan. Stakeholders in the private sector, especially sector associations can also be involved in the enforcement process if enforcement capacity at the responsible ministries is lacking (Approach of Kenya in enforcement of EPR policy).

6.1.3 Knowledge transfer of political CE initiatives from the EU to Africa.

In order to effectively support the CE transition in Africa as described in the previous recommendations, it is key to share the knowledge, experiences and best practices gathered in the European CE transition with African countries. This would also include adapting learnings to the African context as purely European approaches and solutions are not guaranteed to work in another cultural and geographical context. Also, due to its already more advanced CE policy agenda and the strong development and trade relationships, the EU is a valuable and strategic partner to be included in political developments. This is already the case for the ongoing development of the African CEAP, where the European Commission is expected to take part in the experts working group being put in place. To further enhancing these kinds of involvements, the idea of a strategic membership in ACEA as well as closer coordination with AUC should be further pursued by the EU.

As a major issue for effective policymaking in Africa is the lack of monitoring and implementation, the EU should focus especially on these aspects to provide decision-making and monitoring tools. More concretely, this could include the development and integration of monitoring indicators (quantitative and qualitative) for the implementation of CE-related strategies and policies, an interactive mapping of resources and stakeholders or collaboration tools for the development of CE policies and models. The EU and MSs could provide on-demand support to African countries with CE-related policy development.

6.1.4 The internal coordination of CE initiatives on the part of the EU.

The coordination of and involvement in different programs and initiatives across sectors and policies as well as geographic levels also require a well organised and aligned internal structure on the part of the EU. Within our research and analysis of both the country reports and this continental one, it has been observed that although CE is a cross-cutting topic, different Directorate Generals (DGs) run external and internal CE-related projects and initiatives without fully aligning with each other. This might potentially lead to double work, unexploited synergy potential and missed opportunities of valuable collaboration – a similar observation has been made on the MS level. It is, therefore, recommended to further align, link and coordinate CE-related programs, projects and research that can contribute to African CE transition between DG ENV, DG INTPA and NEAR, DG TRADE, DG RTD, JRC and DG GROW notably. Considering the horizontal nature of CE, further synergies with work done by DG CLIMA (on climate mitigation and adaptation), ENER (on sustainable energy transition), AGRI (on sustainable agriculture and food systems), CNECT (on digital transition), MOVE (on sustainable mobility), MARE (on blue economy, ocean governance and sustainable fisheries), FISMA (on sustainable finance), JUST (on sustainable corporate governance) should also be sought.

Close connection is also needed with EEAS to ensure that the Circular Economy is promoted at political level through the European Green Deal diplomacy to expand the scope of external affairs which have been tackled so far and focalise more on CE. DG INTPA also has an important role to play next to DG ENV in the coordination of CE-related initiatives with Africa to gather experiences and knowledge, encourage collaboration within the DG, across DGs and with MS, develop an overview of ongoing and planned CE projects and policies and, most importantly, to link them to development aid.

6.2 Trade cooperation

The trading landscape between African countries and the EU is slowly changing (the share of trade from developing countries is growing) but at the same time, we see that the Least Developed Countries (LDCs) continue to face difficulties to diversify their export base. The EU's Scheme of Generalised Tariff Preferences (GSP) is an important step forward but by far not enough to result in structural trade changes with most African countries.

- The scheme of **Generalised Tariff Preferences (GSP) for LDCs could be further adapted to promote sustainability and circularity**. Beyond the priority given to the implementation of labour and human rights international commitments in the upcoming review of the GSP, CE-related activities (goods and services) in the African continent could be considered to fall under the "GSP+" -scheme (offering close to full removal of duties) or even under the 'Everything But Arms'-scheme (the most advantageous arrangement which grants Least Developed Countries duty-free, quota-free access to the EU market for all goods except for arms and ammunition), provided that the goods or services traded comply with mutually or internationally agreed CE-related standards (see 3rd bullet)²⁷⁵. This would require an internationally agreed definition of CE-related goods and services that could fall under these schemes;
- **Implement Economic Partnership Agreements (EPAs) effectively and evolve towards including a stronger sustainability dimension in these agreements most African countries**. The five EPAs the EU has with African countries should be used to promote sustainable development. EPAs provide a framework for closer economic cooperation, investments in sustainable value chains and increased trade in sustainable products that benefit the transition to climate-proof economies and energy systems²⁷⁶. But on the longer term, it would be best to focus on the introduction of new sustainable development provisions, including CE aspects, in existing and future agreements.²⁷⁷
- A lack of internationally agreed **standards waste classification systems and quality standards for secondary materials** hampers the facilitation of the CE transition through trade in the global context. To move the CE forward, the EU has already taken steps to develop end-of-waste criteria and relabel some waste types to increase the possibilities for using end-of-life products for new purposes. Internationally, such relabelling has not yet been agreed upon. This hampers certain circular practices, e.g., it prevents producers from re-importing end-of-life products for refurbishment, remanufacturing or sound recycling;²⁷⁸ The EU should promote setting up of the international standards for CE in the multilateral fora.
- **Product standards** could be implemented or strengthened, by including minimum criteria relating to durability, repairability, recyclability etc. Such standards are now often enforced in national jurisdictions, but in order to effectively promote CE on a global level it is important that CE-related standards are agreed upon at a regional level, but preferably at the international level or it could also take the form of mutual recognition of individual CE-related standards between partners. The EU and African Union could cooperate more closely to develop and push for the agreement on CE-related standards at the international level. Standards to be developed could cover²⁷⁹:

²⁷⁵ Commission SWD: 2019 EU report on Policy Coherence for Development (PCD)

²⁷⁶ COM(2021) 66 final - [Trade policy review -an open, sustainable and assertive trade policy](#)

²⁷⁷ Kettunen, M., Gionfra, S. and Monteville, M. (2019) EU circular economy and trade: Improving policy coherence for sustainable development, IEEP Brussels / London

²⁷⁸ Yamaguchi & Steenblik (2018) [International trade and the transition to a more resource efficient and circular economy -concept paper](#)

²⁷⁹ OECD (2018) International Trade and the Transition to a Circular Economy

- Requirements related to EcoDesign;
- Requirements on durability, prohibition/discouragement of planned obsolescence;
- Requirements on repairability;
- Requirements related to chemical or material composition and recyclability.
- Sustainability requirements based on internationally agreed principles.
- The EU could invest in increased customs checks within its own borders to fight illegal waste shipments to Africa as part of trade in second-hand goods (especially in the areas of end-of-life vehicles and EEE products). At the EU-level, the revision of the Waste Shipment Regulation could play an important role in this regard, whereas at the same time enforcement of existing legislation at the Member State level needs to be strengthened. Additionally, the EU could invest in capacity building or support customs in African countries to check the incoming imports for illegal waste in the context of customs cooperation or within development cooperation programs.

6.3 Development & financial cooperation

There are currently many national, European and international financial programmes and support mechanisms in place which do support (directly or indirectly) CE in different African sectors and at different levels (local, regional or national).²⁸⁰ However, none of them has the global overview and there is only little cooperation which regularly leads to unknown ‘competition’, especially with the international donors. The EU, hand in hand with the MSs, could play an important role to improve the coordination but also in providing capacity, financial instruments (guarantees) or promote CE-activities or the use of labels. The ongoing programming process of the Neighbourhood, Development and International Cooperation Instrument (NDICI) is anticipated to bring some more clarity by becoming the main financial cooperation instrument with Africa in the next 7 years. Also, CE-financing could become an explicit part of investment activities under the EIP, helping the EU’s investment targets in relation to the EFSD while accelerating the transition towards CE both in Africa and the EU. In addition to this, following aspects should be realised:

- **Mainstream Circular Economy in the programming of the NDICI for 2021-2027** at national, regional and continental level. This should be done by supporting specific CE-related actions, strategies and policies at country-level, but also by ensuring that circular approaches are promoted in all relevant sectoral cooperation activities.
- **Build a stronger cooperation between national Development Banks at MSs level (DBs) and between these DBs and the International Development Banks (IDBs).** Although the Member States are rather independent regarding development aid, the EU can carry out a common development policy. The idea is that the level of cooperation is going beyond the current practice (i.e., that Member States’ development agencies implement EU-funded programmes) as such that the EU could coordinate the activities between the national development agencies and their banks. The aim is that there is much more a common EU-approach or that at least all MS’ development agencies are informed about each other activities and the EU (DG INTPA) can play a bridge function between the national development agencies (and NDBs) to help them working more together. CE could be a test case how to cooperate more and better together at EU level. The EU should also be the logic linking pin between the NDBs and the IDBs;

²⁸⁰ The EU and its MSs are the world’s leading aid donor, providing EUR 74.4 billion in Official Development Assistance (ODA) - figures for 2018 based on Fact Sheets on the European Union - 2020 (European Parliament).

- **Build capacity amongst financial institutions, relevant ministries, and the private sector.** A first step could be to set up collaboration programs at the public institutional level with EU-based financial institutions, EU Delegations, development agencies/banks and eventually regional financial institutions. To ease their processes of recognising bankable loans, these programs could include the training in the identification of specific technologies that would support the sectors identified in the African CEAP. The next step would be to also include the private sector and initiate a multi-stakeholder policy dialogue at the financial level;
- **Provide new financial frameworks or financial guarantee funds.** This would allow financial institutions to offer low interest rates for loans, subsidies and ease access to banking solutions with no warranty conditions. As an example, the intervention of the Central Guarantee Fund (CCG) offers many advantages, such as the facilitation of access to credit, reduction of the cost of financing, preferential treatment of (M)SMEs and the improvement of the relation bank-enterprise. Beyond the bank-enterprise relationship, there is also the potential to leverage finance from the private sector to implement CE programs, projects and initiatives through the collaboration with national Green Funds;
- **Align financial models and instruments to the nature of CE business models.** Financial instruments do often not correspond to the needs and nature of CE SMEs. This ultimately hinders them to expand and scale. In order to address this mismatch between how small CE businesses operate and how financial instruments are designed, it is necessary to adjust and/or expand financial services offered by local banks. This would, for instance, include short-term micro-loans at lower interest rates, made available for both pilot and implementation of initiatives;
- **Establish criteria to assess the circularity of local businesses and develop ways to identify businesses that are engaged in CE-related activities.** The finance sector does not apply appropriate investment tools to evaluate potential recipients. The Circular Economy Guide²⁸¹, recently published by the EIB can serve as to improve the availability of financing and revisit its approach to appraising linear and circular risks. To make full use of the guide, it should be adapted to the respective national context, considering the socio-economic conditions, and conducting a market screening. Another challenge is that many businesses are just unaware of the CE concept and therefore do not label themselves as a circular company. Financial support for such existing companies with circular activities could act as a flywheel for scaling up the circular economy in Africa. An important means to leverage this challenge is the African Circular Economy Facility (ACEF)²⁸², a multi-donor trust fund to support the adoption and diffusion of circular practices in Regional Member Countries, recently developed by the AfDB;
- **Develop ways to familiarise financial institutions with circular business models.** Financial institutions are often unfamiliar with innovative circular business models such as companies offering products-as-a-service or produce new circular products and hence perceive such activities as having a high financial risk. Showcasing successful business models and business results of circular companies in events with stakeholders from the financial sector and linking these to CE incubators could increase the trust of finance institutions and match promising businesses to potential investors.

²⁸¹ European Investment Bank (2020) [The EIB Circular Economy Guide - Supporting the circular transition](#)

²⁸² AfDB (2020) [Fostering Inclusivity with Circularity in Africa's post COVID-19 Recovery](#)

6.4 Research cooperation

Circular Economy is a relatively new trend in Africa, and this also holds for research and knowledge institutions. Several African countries have established networks of research professionals and access to local expertise, but CE-specific related knowledge and capacity are lacking. As such, there is a significant need for CE education and research as well as for the transfer of findings to the private sector. The EU could cooperate with Africa in the area of CE research in various ways.

6.4.1 Knowledge transfer and capacity building

- Existing research cooperation should be broadened to include the topic of CE. Existing relationships between EU and African universities and higher education institutes should be utilised to expand research to the CE notably in the priority areas addressed in this report (which are in line with the priorities identified by the African Circular Economy Alliance). African government departments on science and innovation and the like should also be involved. Future EU-AU research and innovation (R&I) ministerial meetings could offer a platform for this;
- **New partnerships between European and African universities and higher education institutes** must be established to facilitate the sharing of knowledge and skills around CE and to increase awareness in this area. Existing partnership programs such as APPEAR²⁸³ could build the foundation for such efforts. These partnerships could materialise in many forms, ranging from *exchange programs* for students and professors; to *conferences, online workshops and webinars*; to *joint research programs* funded by the EU (Horizon 2020, Horizon Europe) and in other major global research programmes and projects. Further, circular economy research *task forces* and/or *working groups* could be set up focusing on (specific) CE activities. New partnerships on CE can be established following similar existing, successful initiatives such as the working group of the R&I Partnership ‘Climate Change and Sustainable Energy’ of the AU-EU High-Level Policy Dialogue on Science, Technology and Innovation;
- **Transfer knowledge and best practices already available in Europe** (of universities, research and innovation institutes, companies) to African research organisation (and business). Knowledge transfer should include applied knowledge on how to develop *circular value chains, putting the right capacity* in place, *enabling technologies* and *business models* and the development of *academic pathways* that lead to furthering local (technology) capacity and competencies with regards to the CE. The EU should involve any relevant local, African partners that are well positioned to engage in joint Circular Economy research initiatives;
- **The set-up of a web-based CE learning platform** with EU as well as African content to facilitate collaboration between EU and African CE stakeholders (from governments, to universities, research institutes, business and civil society). This platform could encompass both basic and higher education resources on circular economy for trainers and trainees. This platform can give the opportunity to:
 - Share past and on-going projects, studies and publications and best CE-related practices;
 - Promote developed CE-related technologies and models in relation to CE and facilitate technology transfer;
 - Access to educational resources, tools and methodology on CE research.

²⁸³ APPEAR is a programme of the Austrian Development Cooperation with the overall objective to strengthen the institutional capacities in higher education, research and management in the addressed countries. It does so through Academic Partnerships with Austrian higher education institutions and master’s and PhD scholarships as a contribution to effective and sustainable reduction of poverty. APPEAR encourages professionals and higher education institutions in the addressed countries and in Austria to share their knowledge and experiences with each other, to design innovative projects targeting the objectives and expected results and to improve the general standards in higher education, research and management.

- Research cooperation could include *the development of standards* for products to promote CE. In addition, *the digital divide* should be addressed when it affects the opportunities of advancing technologies for cleaner production and waste minimisation (next to research this will require exceptional and coordinated efforts from governments, businesses and donors);
- **Help set-up incubators aimed at joint research and developments of technologies** that can be adopted in the local African context. For example, the EU could cooperate with the AfDB who are working on incubation hubs for SMEs and social enterprises / entrepreneurs across Africa. The emphasis needs to be on cooperation, with strong contribution of local expertise. Such an EU engagement to share EU (educational) best practice can support a strained educational system needed for a strong research base helping develop the ecological and technical skills of the trainers and trainees.

6.4.2 Promote and encourage partnerships between research institutions & the private sector

- **Cooperation between EU and African research institutes and the private sector** can drive scalability of pilot projects. The EU could/should issue calls for proposals promoting EU-African business and research partnerships. Involvement of local African organisations which are knowledgeable of the local economic context is key to ensure that the solutions that are being developed fit the local context of specific African countries. Next to that it is important that local innovations get showcased.
- **Transfer of CE research from academia and knowledge institutes to the private sector (MSMEs)** is needed in order to turn research findings into actionable projects and marketable products/services. In addition, transfer of knowledge - whether this is on CE business models, value chains, business cases, standards or labels, designing for end of life - is essential for upskilling people and stimulating employment in the CE economy. For this, linking academic institutions and private sector representatives is key. The EU can foster the general involvement of academia as well as academia-business relations in Africa by encouraging African industries to participate in calls from EU RDI programmes (most notably Horizon Europe) and supporting higher education institutions in promoting standardisation and policy work.
- **The creation of a match-making platform** where the African private sector is able to publish their needs, projects, challenges in relation to CE, and universities or research institutions can express their interest in participating in such research.

6.4.3 Promoting international exchange programs with a particular focus on CE

- The EU should cooperate with high education institutes to organize **(University) Exchange Programs** specifically designed to promote CE knowledge sharing between Africa countries and EU-based Universities. Established programmes such as Erasmus and Erasmus+ can provide frameworks for this.
- **R&I programmes** like the ones from the European Research Council and Marie Curie, operating under Horizon 2020 and Horizon Europe, are open to all scientists in the world and to any innovation area for free. The EU should ensure that these programmes include a CE focus and importantly ensure that the African research community to these programmes.
- **Adapting EU exchange programs and vocational building programs for the African context.** Existing exchange programs and vocational building programs in the EU and its member states can help accelerate capacity building and skills development on circular and green industries in order to support local value chains in Africa. Successful EU training and up-skilling programmes with focus on design for circularity, waste management, and the sharing of best practices could

be adapted to the local context. EU multinationals could be encouraged to organise private sector-led apprenticeships that ease access to industries that are emerging and may not have established academic institutions offering relevant training.

- **The exchange / sharing of innovations and technologies** is a key element of technical and academic cooperation between African countries and the EU. The sharing of technical knowledge is necessary for the adoption of imported technologies and services.

6.4.4 Directions for further research and data availability

- Data availability and quality needs to be improved in the fields of:
 - Economic production by sector at a sufficient level of disaggregation (missing data on repair services, renting and leasing services and much more);
 - Waste generation and waste management (including recycling);
 - Resource consumption;
 - (Informal) employment by sector.
- With regard to trade data the EU and Africa should make efforts to increase data availability on trade in secondary materials and second-hand goods. Currently, these flows are mostly hidden in the total waste flows that also include new materials and products;
- More research is needed to investigate, accurately measure and model the environmental benefits of a circular economy transition in Africa with regards to reducing pollution, resource savings and GHG impacts;
- Research into the effectiveness of implemented CE policies, i.e., this study remained mostly at the level of mapping policies rather than assessing them;
- The EU or specific entities such as EUROSTAT could support Africa in improving the procedures for data collection and processing and harmonising this across countries. Perhaps the African Union could also be involved in such a process;
- Future research initiatives should investigate into a comprehensive mapping of MSMEs that pursue CE principles.

6.5 Business cooperation

- **Stimulate the organisation of events that provide networking, matchmaking and dialogue platforms** which can be used to create a supportive environment for EU/African companies with CE activities in Africa. EU-led events such as the European Development Days, the ACP-EU Assemblies, Global Climate Change Alliance Plus (GCCA+), the Climate Diplomacy Week are examples. Next to these, the Europe-Africa Business Forum, the Sustainable Business for Africa Platform, the Partners for Growth (P4G) platform (active in Kenya and South Africa) could provide an ideal basis to bring together green businesses from EU and Africa to exchange practices along the value chain and facilitate access to markets and finance. In addition, an online matchmaking series could be organised in the run-up to any upcoming EU CEMs. The online sessions could cover specific thematic focus areas (e.g., agriculture, housing and construction, waste management, digitization) and would involve a wide range of stakeholders.
- **Development and advertisement of labels to encourage local production of goods.** African countries are generally (very) import-dependent therefore there is an opportunity for African countries to start producing goods that until now have been imported from Europe or Asia, in order to supply the domestic demand. Labels such as “made in {X African country}” or “made sustainably in {X African country}” can drive awareness, demand and certainly comfort

consumers in their choices. The EU could assist Africa in the development of sustainability criteria underlying these labels, once the EU Sustainable Finance Taxonomy is completed.

- DG INTPA (hand in hand with the EU delegations) should **promote CE-activities with high business potential in Africa**. Business to business opportunities in the field of CE concern for ex. waste management, trade in environmental goods (scrap metals, plastics), industrial symbiosis. A development opportunity lies with inclusion of the informal sector in waste management. With respect to African industry, manufacturing and construction, it is critical to upgrade industrial parks and similar into eco-industrial parks (EIPs) that follow industrial symbiosis or CE approaches. The EU may partner with African governments and concerned institutions to initiate programmes / projects to operationalize EIPs CE approaches in industry, manufacturing & construction through upgrading existing and planned industrial parks.

Annex A - Stakeholders interviewed

Table A-1 Overview of interviewed stakeholders

Name	Organisation	Area of expertise	Report section in which inputs are reflected
D. Milenge-Uwella, M. Murara	African Development Bank		
Bonmwa Fwangkwai, Steve Kisakye, Bertrand Assamoi, Syakaa William	Dalberg	The African CE Alliance	Chapter 2.1
Indre Vaicekauskaite & Remco Vahl	DG Trade	Circular economy and trade	Section 6.6
Thibaut Portevin	DG INTPA	EU policy on external action and development cooperation	Chapter 5
Matthias Reusing	EU Delegation to Zambia	Circular economy initiatives in Zambia, EU regional programming in Africa	Section 6.1
Elias Ayuk & Antonio Pedro	International Resource Panel	Resource consumption trends in Africa	Section 2.2.1
Marianne Ketunen	Institute for European Environmental Policy (IEEP)	Circular economy and trade	Section 3.2.1, section 6.6
Shunta Yamaguchi	OECD - Joint Working Party on Trade and Environment	The relation between trade and the environment (incl. CE)	Section 3.2.1, section 6.6
Yame Nkgowe, Sahar Mohyuddin, Tuduetso Ramokate, Gaokgakala Sobatha, Kagiso Sebetso (Botswana)	Director of Seriti UAS Data & Integration, Member of ACEN and Botswana's Green Building Council	CE in construction, sustainable urban planning, waste	Section 2.2.2, Section 6.1.2
Tobias Muyaba (Zambia)	Consultant at DH engineering, Member of ACEN	Expert in Social Development and Environmental Compliance	Section 2.1
Bezawit Eshetu (Ethiopia)	CE Expert FAO, Member of ACEN	CE Measures in agriculture	Chapter 2.2
Josselline Landry Tsonang (Cameroon)	Founder Maluwa Africa, Sustainability Manager D&D Smart Construction, Member of ACEN	CE, natural resource management, environmental assessment and regional planning, agriculture, construction, women empowerment	Chapter 2.1
Amelia Kuch & Sarah O'Carroll	Ellen MacArthur Foundation	CE policies and priority sectors	Reflected in Chapter 2.1 and 2.2
Johanna Tilkanen & Patrick Schroeder	Chatham house	CE policies	Chapter 2.1
Israel Dufatanye	Rwanda Environmental Management Authority (REMA)	CE policies (plastic)	Chapter 2.1 and 2.2
Nilgun Tas	UNIDO	Industrial development in developing countries and resource efficiency	N.A.
Jade Wilting	Circle Economy, Textiles team	Circular Textiles in Africa	Chapter 2.2.2

Annex B - Important stakeholders in the Circular Economy in Africa

Figure B-1 Stakeholder map

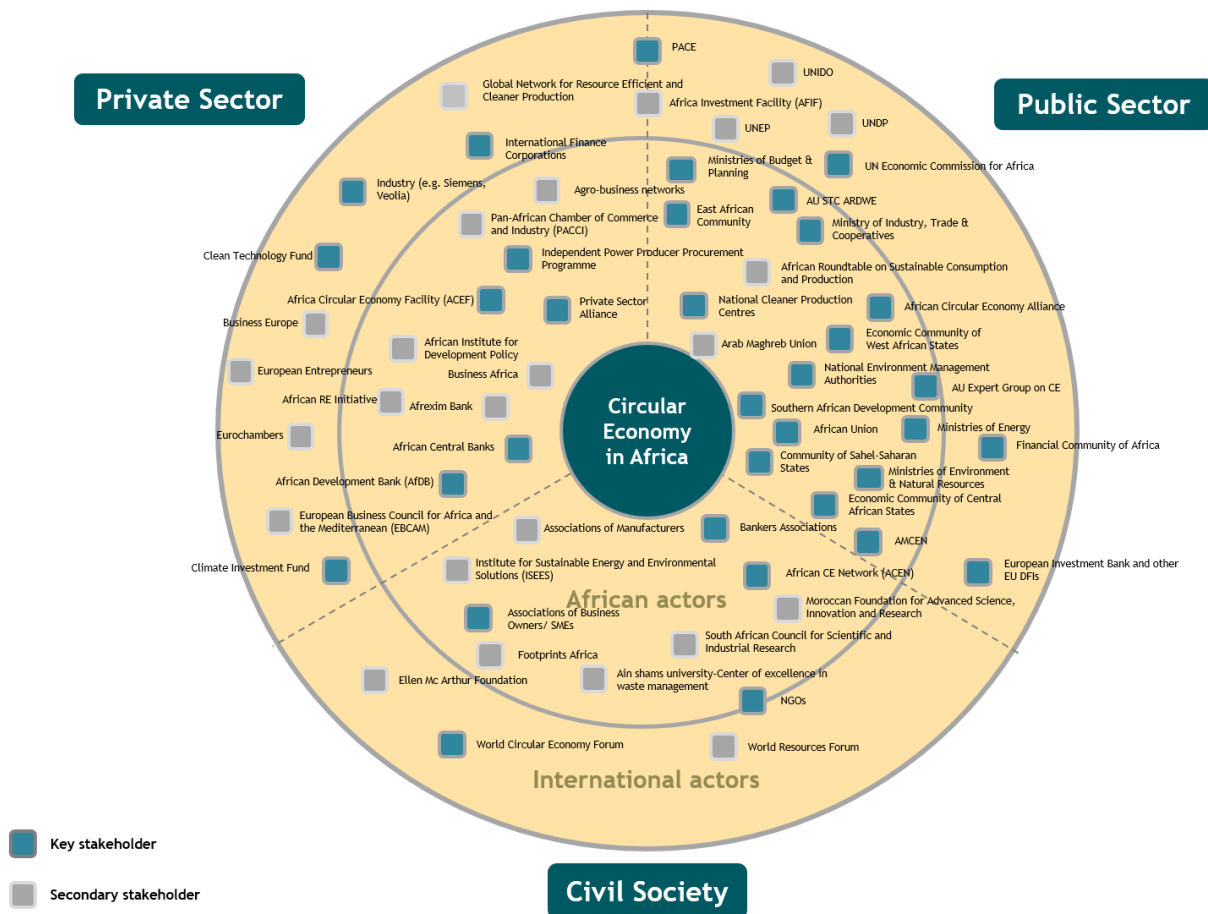


Table B-1 Stakeholders from the private sector

Name	Based in	Active in	Activities	Typology
Amandus Kahl	Germany	Egypt	Conditioning of municipal and industrial waste	Value Recovery
Acconia Agua	Spain	Egypt	Water treatment	Value Recovery
Energic Plus	Belgium	Egypt	Energy storage and power supply	Optimal Use
Geocycle	Switzerland	Egypt	Industrial, agricultural and municipal waste management services	Value Recovery
Ouishare	France		sharing economy	Circular Support
Henkel	Germany		Beauty and Laundry Care	Value Recovery
Aqualia	Spain	Egypt	Water treatment	Value Recovery
Jeanologia	Spain	Egypt	technology provider for manufacturing of equipment textiles and garments	Circular Support or Design?
LafargeHolcim	Switzerland, France	Egypt, Kenya	Cement industry	Value recovery
Heidelberg cement	Germany	Egypt	Cement industry	Value recovery
Closing the Loop	Netherlands	Ghana, Nigeria	Mobile phone recycling facilitator	Circular support

Name	Based in	Active in	Activities	Typology
Danone - parent company of Fan Milk	France	Ghana	Milk production	Value Recovery + Circular Support
Komptech Austria	Austria	Ghana	Machinery and mechanical systems for the treatment of solid waste and biomass	Value Recovery
Fairphone	Netherlands	Ghana	Smartphone producer	Circular design
Safi Sana	Netherlands	Ghana	Waste-to-energy factories	Value Recovery
Sea2See	Spain	Ghana	Fishnet Collection	Circular Support
Mr Green	Switzerland	Kenya	Plastics Recycling	Value Recovery
Worldloop	Belgium	Kenya, Rwanda	Recycling and treatment of e-waste	Value Recovery
Veolia	France	Kenya, Morocco, Senegal	Water treatment	Value Recovery
Indra Recycling	France	Morocco	EO Vehicle Recycling	Value Recovery
Suez	France	Morocco	EO Vehicle-Parts Recycling	Value Recovery
Elephant Vert	France	Morocco	Organic pesticide and fertilizer manufacturer	Circular Design, Value Recovery
Sovamep	France	Morocco	Metal recovery	Value Recovery
Texaid	Switzerland/Germany	Morocco	Textiles recycling	Value Recovery
Wolkat	Netherlands	Morocco	Textiles recycling	Value Recovery
Lafarge	France	Nigeria	Building Materials Manufacturer, waste management	Value Recovery
BASF West Africa	Germany	Nigeria	Chemical recycling	Value Recovery
Presco (Siat Group)	Belgium	Nigeria	Organic waste processing	Value Recovery
Schneider Electric	France	Nigeria	Digital transformation of energy management and automation	Circular Design, Optimal Use, Value Recovery, Circular Support
Heineken	Netherlands	Rwanda	PET recycling	Value recovery
Sweco	Sweden	Rwanda	Urban planning	Circular Support
This Side Up Coffee	Netherlands	Rwanda	Sustainable coffee bean farming	Circular Support
Volkswagen	Germany	Rwanda	Ride-sharing services	Optimal Use
STRAWTEC Business Solution	Germany	Rwanda	Sustainable, green building and construction	Circular Design
Aventurin	Germany	Senegal	Operation of plastic chemical recycling facility	Value recovery
Eiffage & RéaVie	France	Senegal	Water treatment and CE support	Circular Support
Geolhyan	France	Senegal	Sustainable water management solutions	Circular Support
PV Cycle	Belgium	Senegal	Recycling of EEE and PV modules	Value Recovery
Saur	France	Senegal	Wastewater treatment	Value Recovery
Erema	Austria	South Africa	Plastics recycling	Value Recovery
Herbold Meckesheim	Germany	South Africa	PE recycling	Value Recovery
Unilever	Netherlands	South Africa	Plastic recycling mechanisms	Value Recovery, Circular Support
Remondis	Germany	South Africa	Water resource management	Value Recovery
Alpla	Austria	South Africa	Plastic packaging and recycling	Value Recovery

Annex C - Methodology for the modelling

Part 1 General approach to circular economy modelling

The E3ME model

The process of estimating impacts on Africa of circular economy activities in the EU and Africa was carried out using Cambridge Econometrics' E3ME model. E3ME is a global, macro-econometric model of the world's economic and energy systems and the environment. It was originally developed through the European Commission's research framework programmes and is now widely used for policy assessment, forecasting and research purposes across different geographical areas.

E3ME's historical database covers the period 1970-2016 and the model projects forward annually to 2050. The main data sources for South Africa are the World Bank, UN National Accounts, IMF and ILO, supplemented by data from national sources. Energy and emissions data are sourced from the IEA and EDGAR. Gaps in the data are estimated using customised software algorithms.

The current version of the model has the following dimensions:

- 61 regions - all major world economies (i.e., G20), the EU28 and candidate countries plus other countries' economies including South Africa;
- 43 industry sectors (70 in European countries), based on standard international classifications;
- 28 categories of household expenditure (44 in European countries);
- 23 different users of 12 different fuel types;
- 14 types of airborne emissions (where data are available) including the six greenhouse gases monitored under the Kyoto protocol.

The impact of policies and economic reforms can be simulated thanks to a detailed representation of sectors and spending categories built into the model: 43 industry sectors, based on standard international classifications; and 28 categories of household expenditure, 23 fuel users of 12 fuels and 15 users of 7 raw materials. As a general model of the economy, based on the full structure of the national accounts, E3ME is capable of producing projections for GDP and the aggregate components of GDP (household expenditure, investment, government expenditure and international trade), and other output indicators including employment by sector and GHG emissions.

In addition to capturing direct and indirect impacts from the transition to a more circular economy, the model can capture the full induced effects, most notably rebound effects. A shift to a more circular economy involves reducing inputs to production (the direct effect), and this in turn affects demand along supply chains (i.e., the indirect effects²⁸⁴). In addition, these shifts create changes in demand and employment, for example through creating jobs in recycling, leading to higher aggregate wages in the economy, or from reducing prices faced by consumers and therefore allowing higher real consumption. This creates additional demand, and further boosts value added and employment (induced effects²⁸⁵).

²⁸⁴ Indirect effects are associated with input-output relationships between industries and refer to the knock-on impacts on other industries in the supply chain. For instance, if circular economy activities reduce construction demand for raw materials, then the extractives sector will see a fall in demand. This will in turn cause falls in demand for their suppliers (e.g., business services), and so on.

²⁸⁵ Induced effects refer to wider macroeconomic impacts. For example, if the construction sector operates more efficiently due to circular economy activities, it may be able to employ more workers or pay higher wages. This may ultimately increase demand for raw materials, so the net impact of all these effects on the extractives sector may be positive, even if the direct and indirect effects had been negative.

The rebound effect for the circular economy means that some of the initial reductions in resource consumption are eroded due to additional spending elsewhere in the economy.

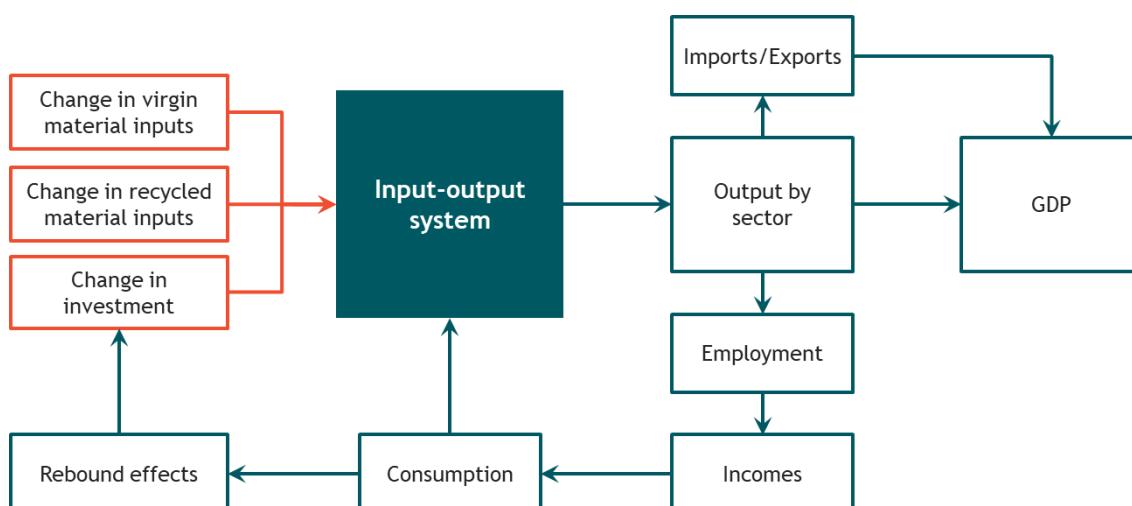
For more information on the E3ME model, including the model manual, please visit www.e3me.com.

Model linkages and feedbacks

The impact of circular economy activities will not be linear. A change in investment or material consumption may have feedback effects that may in turn alter investment and consumption levels. A full-economy model like E3ME is able to capture these complex interactions, enabling a deeper analysis of the trade-offs inherent in a circular economy transition, as limits are placed on certain economic activities while demand for others increases.

For instance, the shift towards recycled materials will tend to increase the labour intensity of production. On the one hand, we can expect that this will increase unit production costs, which may be passed on to consumers via higher prices. Such a negative supply shock would be expected to reduce consumption in the economy. Furthermore, increasing the capacity of recycling centres may require more advanced machinery of a kind that is not produced domestically, causing imports to increase and GDP to fall.

Figure C-1 E3ME linkages - flow diagram



On the other hand, the shift towards recycled materials may also be associated with increased employment, increasing disposable incomes and consumption. The additional investment required by the transition would also filter through the economy, increasing demand in the financial and construction industries, among others.

The overall consumption of raw materials is determined by these trade-offs within the economy. If the rebound effects from the additional demand are strong, the impact of circular economy activities may be to increase the extraction of raw materials more than ever, with improved resource efficiency offset by higher consumption overall. As the relative importance of sectors with different labour and carbon intensities changes as a result of the circular economy, we may expect to see similar dynamics in terms of employment and carbon emissions in aggregate, with employment and carbon emissions being added in certain areas of the economy while employment and emissions potentially being reduced in other areas of the economy. Through its model linkages and feedbacks, E3ME captures these various effects and estimates the net impacts.

Part 2 The impact of an EU CE transition on trade with Africa (section 3.3)

Scenario design

Following the ‘activities approach’ described above, we assume an increase in circular economy activities in selected sectors in the EU and analyse the impact of these activities on the EU’s trade relationship with Africa.

We compare the effects of these activities under both ‘moderate’ and ‘ambitious’ circular economy scenarios, with different assumptions about the level of circular economy activity that would take place in each of the selected sectors. We compare these two scenarios to a baseline scenario (or a ‘business-as-usual’ case), in order to isolate the impact of the circular economy activities on the economy (see Table C-1).

Table C-1 Scenario design - CE transition in the EU

Scenario	Scenario Description
Baseline	A baseline constructed based on official published economic and energy-sector projections. The modelling baseline does not explicitly assume a certain level of circular economy activity.
Moderate CE scenario	This scenario assumes a moderate uptake of circular economy activities, beyond those already included in the baseline scenario. The base year for the modelling is 2020 and the target year is 2030.
Ambitious CE scenario	This scenario is identical to the moderate scenario, except assumes an ambitious uptake of the circular economy, in addition to the baseline scenario. The base year for the modelling is 2020 and the target year is 2030.

Scenario assumptions

These circular economy scenarios assume an adjustment of usage of alternative materials, energy sources, virgin materials (e.g., metals, plastic, petrol), which are substituted by recycled materials or organic waste. Furthermore, we assume an increase in repair activities and in the extent of the collaborative economy (growth of sharing, thus reduction in demand for traditional products and an increase in demand for the household sector).

The circular economy scenario modelled an increase in circular economy activity in a handful of key sectors, which were considered as having a major transition potential:

- food products & beverages;
- motor vehicles;
- construction;
- electronics and electrical equipment;
- waste collection and treatment.

These sectors and associated circular economy activities were selected based on an analysis conducted for a previous report for DG Environment: [‘Impacts of circular economy policies on the labour market’](#). Details on the rationale for selecting these sectors and activities can be found there. The size of the inputs for each of these sectors in each scenario is described in Table C-2 below.

Table C-2 Scenario assumptions

Sector	Circular economy activity	Modelling input	Input size: Moderate scenario	Input size: Ambitious scenario	
Food	Reduction in overall fertilizer use	Reduction in agriculture sector's purchases from chemicals sector	-€20bn	-€20bn	
	Substitution of inorganic with organic fertilizers	Increase in agriculture sector's purchases from agriculture	Increase to €4.4bn total	Increase to €4.4bn total	
	Reduction of food waste	Reduction in household spending on food	Reduction in household spending on food	-€12.3bn	-€24.5bn
		Reduction in hotels & catering sector's purchases from agriculture and food manufacturing sectors	Reduction in hotels & catering sector's purchases from agriculture and food manufacturing sectors	-€3bn	-€6bn
		Reduction in retail sector's purchases from agriculture and food manufacturing sectors	Reduction in retail sector's purchases from agriculture and food manufacturing sectors	-€1.5bn	-€3bn
		Reduction in food manufacturing sector's purchases from agriculture	Reduction in food manufacturing sector's purchases from agriculture	-€1.95bn	-€3.9bn
		Reduction in food manufacturing sector's purchases from rubber and plastics sector	Reduction in food manufacturing sector's purchases from rubber and plastics sector	-2.2%	-11.1%
	Use of organic waste as animal feed	Agriculture sector shifts purchases of feed to purchases from food manufacturing	0.4% of feed inputs replaced by organic waste	1% of feed inputs replaced by organic waste	
Biogas production from manure in agriculture	Increase in utilities sector purchases from agriculture	145 PJ biogas from manure	290 PJ biogas from manure		
Construction	Recycling, reuse and reduction of Construction & Demolition waste	Shift in construction sector's purchases from non-metallic minerals sector (cement, sands, glass, ceramics etc.) to recycling sector	5% of virgin inputs replaced by recycled inputs	15% of virgin inputs replaced by recycled inputs	
	Sharing, efficient use of empty buildings	Reduction in consumer spending on hotels and catering	-€6.4bn	-€18.4bn	
		Increase in consumer spending on miscellaneous services (i.e., collaborative platforms such as AirBnB)	€1.05bn	€3.03bn	
	Modular design	Reduction of unit production cost in construction sector	-3%	-9%	
Reduction in labour demand (i.e., increase in labour productivity)		-5%	-10%		
Motor vehicles	Car sharing and use of autonomous vehicles	Reduction in car demand (i.e., purchases of new cars)	-7.5%	-15%	
		Reduction in petrol & diesel demand (i.e., increase in fuel efficiency of travel due to car sharing)	-6.5%	-8.4%	

Sector	Circular economy activity	Modelling input	Input size: Moderate scenario	Input size: Ambitious scenario
		Reduction in consumer spending on vehicle operation and maintenance	-25%	-40%
		Increase in consumer spending on sharing platforms	€5.4m	€16.4m
	Electric vehicles	Shift in vehicle energy demand from fossil fuels to electricity	6% of petroleum use replaced by electricity	8% of petroleum use replaced by electricity
	Use of recycled materials in vehicle manufacturing	Shift in car manufacturing sector's demand from ferrous metals sector to recycling sector	2.5% of ferrous metals replaced by recycled inputs	5% of ferrous metals replaced by recycled inputs
Waste management	Increased recycling rate	Increase in waste sector labour intensity	4x higher	4x higher
		Increase in waste sector investment	20%	40%
		Increase in waste sector non-labour operational costs	20%	40%
Electronics and electrical equipment (EEE)	Reuse, recovery, remanufacture, better use of materials, and recycling	Shift in EEE sector's purchases from ferrous metals, non-ferrous metals and rubber and plastics sectors to recycling sector	3% of ferrous metals, 0.5 of non-ferrous metals, 1.5% of plastics inputs replaced by recycled inputs	5% of ferrous metals, 0.5 of non-ferrous metals, 2.5% of plastics inputs replaced by recycled inputs
		Increase in EEE sector's purchases from EEE sector (i.e., repairs)	20%	50%
	Optimising use - P2P sharing, extending product lifetimes	Reduction in consumer demand for EEE products	-2.5% household appliances -1.75% electronics	-5% household appliances -3.5% electronics
		Increase in consumer spending on sharing platforms	25% of above reduction in consumer demand	25% of above reduction in consumer demand

Part 3 The impact on Africa of a CE transition in the EU and Africa (section 4.1)

Scenario design

In this exercise, we again used an ‘activities’ approach to assess the economic impacts on the African continent of an increase in circular economy activity, this time in *both* the EU and Africa. The circular economy activities that were modelled in the EU correspond to the ‘ambitious’ CE scenario for the EU described in the previous section. A separate set of circular economy activities were modelled in Africa, which are described in more detail in the next section. These circular economy activities on both continents were combined into a single ‘combined scenario’, which was compared against a baseline scenario.

Table C-3 Scenario design - CE transition in the EU and Africa

Scenario	Scenario Description
Baseline	A baseline constructed based on official published economic and energy-sector projections. The modelling baseline does not explicitly assume a certain level of circular economy activity.
Combined scenario	A circular economy scenario, including increased circular economy activities in both the EU and Africa. The circular economy activities modelled in the EU correspond to the ‘ambitious’ scenario described in the previous section.

Scenario assumptions: Africa

Increased waste collection and recycling are modelled as central circular economy activities within Africa in the CE scenario. In addition, activities for four additional sectors are modelled, selected based on existing policy priorities, but also on the basis of the anticipated scale of the potential benefits (in consultation with country experts): electronics (e-waste), plastics, agriculture and construction.

The selected activities are translated into modelling inputs and methods, so that the economic, social and environmental impact can be simulated in E3ME. Together, the selected activities should be broad enough to represent the most important circular economy changes and their potential impacts.

Table C4 provides a summary of the selected circular economy activities in Africa, and how the identified circular economy activities were translated to modelling inputs that have been implemented in E3ME.

Table C-4 Scenario assumptions

Category	Circular economy activity	Modelling input	Input size
Waste management	Improved waste collection rate	Increase in waste sector output	€8.9bn
E-waste	Improved enforcement of e-waste trade restrictions	Reduction in e-waste (i.e., electronics) imports	€248m
	Improved recycling of valuable materials in e-waste	Investment in recycling sector to improve health & safety standards	€69m
		Share of recycling investment paid for by private and public sectors	50:50
		Exports of materials recovered from e-waste recycling	€278m

Category	Circular economy activity	Modelling input	Input size
Agriculture	Prevention of food loss in agricultural supply chain through improved storage and logistics	Substitution of agricultural imports by domestic agricultural production	€27.5bn
		Investment in storage and logistical capabilities	€5.2bn
		Share of investment paid for by private and public sectors	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 fertilisers to organic fertilisers	20% of mineral fertiliser replaced by organic fertiliser

As indicated in the last two columns, the various economic changes associated with the circular economy are modelled through specific input assumptions. They mainly relate to gross output, input-output coefficients, investment and the trade balance.

Gross output

The increase in the waste collection rate is modelled as a change in output in the waste management sector. This increase in gross output can be thought of as resulting from a government mandate, rather than being caused by an increase in a component of demand.

Input-output linkages (intermediate demand between sectors)

We have modelled an increase in the circularity of production for a number of sectors through adjustments to the existing input-output structure of the model. This reflects changes to the supply chain of a sector as a result of higher circular economic activities. For example, if the electronics sector uses less metal and plastic material, and substitutes these for recycled parts from e-waste manufacturing, this change is entered to E3ME as an adjustment to the input-output linkages (i.e., coefficients) of the electronic sector: it purchases less from the plastic and metal sectors and more from the recycling sector.

Investment

Some of the modelled circular economy activities are associated with an increase in investment, such as the investment required to prevent food losses in the agricultural sector, or to increase health and safety in the recycling sector. In these cases, assumptions are also needed regarding the share of the investment costs that will be paid by the private and public (or aid) sectors: we have assumed a 50:50 split in all cases. In practice, this means that 50% of the investment input is represented as a cost to the investing industry; the other 50% is assumed to be funded by deficit spending or official development assistance and is thus represented as an injection of funds into the economy.

Trade balance changes

In some cases, the modelled changes to the trade balances represent circular economy activities which directly relate to the trade balance, such as the reduction in imports of e-waste. In other cases, changes to the trade balance are a way to represent a change in productivity in a demand-led model. For instance, we have modelled a reduction in food losses in the agricultural supply chain (effectively an increase in agricultural productivity) as a reduction in imports of agricultural products, as domestic supply is better able to meet domestic demand. Similarly, some portion of the materials recovered from e-waste recycling are modelled as an increase in exports, as we do not assume that domestic demand for these materials has necessarily increased.

Treatment of the informal sector

The informal sector is an important consideration when modelling circular economy activities in Africa, as much economic activity may not be fully recorded in official national statistics. This issue is most relevant to agriculture, given the importance of smallholder agriculture in many African countries. E3ME is capable of capturing this part of the economy, as it is built using economic data from the World Bank and employment data from the ILO, both of which incorporate estimates of the informal sector in their data.

Mapping inputs to E3ME sectors

In some cases, the sectors available for African regions in E3ME are too broad to allow for the targeting of inputs at the level described in

Table F4 above. For example, modelling the increase in waste collection rates required a given percentage increase in the output of the waste management sector. However, in E3ME, waste management is contained within a broader ‘Miscellaneous Services’ sector, and so the size of the waste management sector itself is not given. Table C5 provides an overview of how each of the modelled activities corresponded to the sectors available in E3ME. We produced estimates of waste management output and other missing datapoints using national accounts data, where possible, as well as other sources.

Table C-5 Mapping to E3ME sectors

Activity sector	E3ME Sector	Variables affected by modelling inputs
Waste management	41. Miscellaneous Services	Gross output
Recycling	21. Manufacturing n.e.s.	IO coefficients, Investment, Exports
Electronics	17. Electronics	IO coefficients, Imports
Plastics	12. Rubber & Plastics	IO coefficients
Construction	25. Construction	IO coefficients
Agriculture	1. Agriculture etc	IO coefficients, Investment
Metals	14. Basic Metals	IO coefficients (electronics input)
Chemicals	11. Chemicals n.e.s.	IO coefficients (plastic feedstock, mineral fertilisers)
Mining of non-metallic minerals	4. Other Mining	IO coefficients (construction materials)
Production of non-metallic minerals	13. Non-Metallic Mineral Products	IO coefficients (construction materials)

Annex D - Trade codes construction materials

Table D-1 Trade codes included in construction products in chapter 3.2.2

Construction products by material type	HS codes included in this category
Plastic construction products	3917 Tubes, pipes and hoses, and fittings, 3918 Floor coverings of plastics; 3919 Self-adhesive plates, sheets, film,; 3920 Other plates, sheets, film, foil; 3921 Other plates, sheets, film, foil ...; 3922 Baths, shower-baths, sinks, ...; 3925 Builders' ware of plastics, not elsewhere specified.
Wooden construction products	4407 Wood sawn or chipped lengthwise; 4408 Sheets for veneering; 4409 Wood (including strips and friezes...; 4410 Particle board, oriented strand board,...; 4412 Plywood, veneered panels and similar items; 4413 Densified wood, in blocks, plates, ..; 4418 Builders' joinery and carpentry of wood
Cement	6810 Articles of cement, of concrete or ...
Other mineral construction products	6801 Setts, curb stones and flagstones; 6802 Worked monumental or building stone; 6803 Worked slate and articles of slate; 6806 Slag wool, rock wool and similar mineral wools; 6807 Articles of asphalt or ...; 6808 Panels, boards, tiles, blocks and s ; 6809 Articles of plaster; 6811 Articles of asbestos-cement,; 6812 Fabricated asbestos fibres; mixture; 6813 Friction material and articles thereof; 6814 Worked mica and articles of mica, ..; 6815 Articles of stone or of other minerals
Ceramic construction products	6901 Bricks, blocks, tiles and other ceramic..; 6902 Refractory bricks, blocks, tiles and ..; 6903 Other refractory ceramic goods; 6904 Ceramic building bricks, flooring ..; 6905 Roofing tiles, chimney-pots, cowl,..; 6906 Ceramic pipes, conduits, guttering ...; 6907 Unglazed ceramic flags and paving, ..; 6908 Glazed ceramic flags and paving, ...; 6910 Ceramic sinks, wash basins, wash basins
Glass construction products	7003 Cast glass and rolled glass, in sheets; 7005 Float glass and surface ground ..; 7006 Glass of heading 70.03, 70.04 or...; 7007 Safety glass, consisting of toughened...; 7008 Multiple-walled insulating units of ...; 7016 Paving blocks, slabs, bricks ...
Construction products of Iron & Steel	7301 Sheet piling of iron or steel; 7303 Tubes, pipes and hollow profiles, ..; 7304 Tubes, pipes and hollow profiles,..; 7305 Other tubes and pipes; 7306 Other tubes, pipes and hollow profiles ...; 7307 Tube or pipe fittings..; 7308 Structures; 7317 Nails, tacks, drawing pins,...; 7318 Screws, bolts, nuts, coach screws,..; 7321 Stoves, ranges, grates, cookers..; 7322 Radiators for central heating, ...
Copper construction products	7407 Copper bars, rods and profiles; 7409 Copper plates, sheets and strip, of ..; 7411 Copper tubes and pipes; 7412 Copper tube or pipe fittings
Aluminium construction products	7606 Aluminium plates, sheets and strip,..; 7608 Aluminium tubes and pipes; 7609 Aluminium tube or pipe fittings; 7610 Aluminium structures
Lead construction products	7804 Lead plates, sheets, strip and foil

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