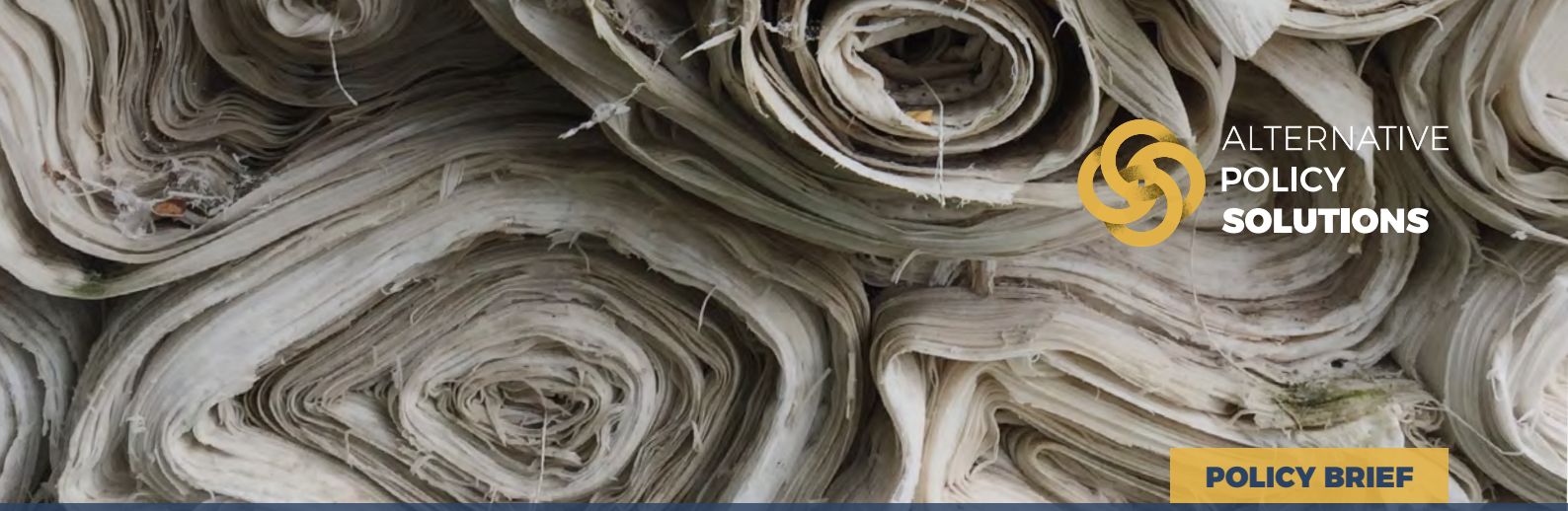

ALTERNATIVE POLICY SOLUTIONS

POLICY BRIEF

Circularity: A Green Recovery Industrial Strategy for Egypt

1. Introduction

If today's global consumption patterns continue, by 2050 humans will need resources equivalent to three Earths (UN, 2021). An inclusive circular economy (for simplicity referred to as "circularity") offers an opportunity to reinvent our economy, by reconciling developing countries' urgent need for rapid economic growth and poverty alleviation with the need to avoid irreversible and costly environmental damage and social inequalities. Circularity is regenerative by design, with the aim of retaining as much value as possible through the superior design of materials, products, systems, and business models. Taking nature as its guide, the circular economy strives to achieve zero waste (energy, water, and material losses) (Ellen McArthur Foundation, 2021).

Egypt faces serious environmental challenges that could impede its ambitious development targets and plans. The 2021 Circularity Gap Report identifies Egypt as one of the largest "grow countries", which are characterized by rapid industrialization and increasing demand for resources. The country would thus benefit from prioritizing resource efficiency, materials valorization and renewable energy (Circle Economy, 2021). Over more than 30 years, the Egyptian government and international donors have sponsored successful programs for energy and resource efficiency in industry. While many of these initiatives focused on building the technical capabilities of governmental counterparts and industrial enterprises, they have not resulted in the large-scale adoption of these cleaner technologies and practices. The industrial sector has fallen far short of expectations, and savings opportunities worth billions remain untapped.

Circularity policies therefore need to be in place to strengthen institutional frameworks and embed circular economy concepts in national strategies, as well as to target sector-specific challenges to the expansion of circular economy practices. This policy brief puts forward recommendations for plastics, textile, and cement industrial sectors to adopt circularity as a national green recovery strategy. The three sectors are proposed due to their environmental impact, importance to the Egyptian economy, and alignment with national initiatives and global circularity priorities.

2. Policy Context

Amid the COVID-19 pandemic, the industrial sector is struggling with additional challenges linked to disruptions in global supply chains. The industrial sector in Egypt relies heavily on imported primary and intermediate production inputs, which together constitute nearly 44% of total Egyptian imports in 2019, according to the monthly Foreign Trade Bulletin (Egyptian Center for Economic Studies, 2020). This vulnerability threatens to disrupt or reduce industrial production and, more importantly, increase unemployment. Circularity is not a conceptual theory, but a proven methodology. According to the Ellen MacArthur Foundation (2021) circular activities such as repair, reuse, and recycling generated almost EUR147 billion in value added in 2016 while accounting for around EUR 17.5 billion worth of investments in the European Union. Few studies estimate the benefits to Egypt, but a 2020 study anticipated a 1% increase in GDP by 2030 and a net increase of 101,000 jobs if circularity practices are adopted (Mahmoud et al., 2020). In addition to the growing consumer demand for environmentally friendly products, the adoption of

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circularity by Egypt's export-oriented manufacturing sectors would give them a competitive edge and thereby boost export opportunities.

Challenges impede the transition to circularity on two levels: national cross-cutting and sector-specific. The barriers to circularity in Egypt are similar to those in other countries, summarized as: 1) regulatory and institutional; 2) technical and financial; 3) informational and behavioral; and 4) industrial sector specific (Sakr, 2016; UNIDO, 2018; Roberts, 2021).

2.1 Overview of the plastics, textile, and cement sectors

2.1.1 Plastics sector

Plastics are an integral part of the global economy used in numerous applications. Egypt's volume of plastics consumption reached USD 9.35 billion in 2019, at an annual growth rate of 9.7% (ElBalad, 2020). Egypt's plastics manufacturing sector is mainly focused on packaging, both packaging containers and packaging film, which represents 36% of the market – followed by pipes and fittings (24%) – and consumes 38% of total plastic raw materials (ElBalad, 2020; Farag & Korachy, 2017). But the growth in Egypt's plastic consumption has a heavy price. Egypt is the biggest source of Mediterranean plastic pollution, with 250,000 tons of plastic leaking into the sea a year, and the biggest polluter in the Arab world, producing 5.4 million tons of plastic waste a year (Noureldin, 2020).

Due to the significant environmental and social negative externalities of plastic packaging, a new circular plastic economy is needed to reduce/avoid unnecessary plastics use and responsibly manage remaining plastics for use throughout their lifecycle, to re-enter the economy as valuable technical or biological inputs.

In 2020, Egypt passed a new waste management law (Law 202/2020), which for the first time includes provisions limiting the use of single-use plastic bags. Article 27 of the law limits the manufacture, import, or export of single-use plastic bags due to their harmful environmental effects. The law seeks to promote the production of environmentally-friendly alternatives to single-use plastic bags by offering economic incentives such as tax exemptions to private-sector businesses and producers of single-use plastic bags. However, the law's executive regulations have not yet been issued.

2.1.2 Textiles sector

Egypt's textile sector is one of the top labor-absorbing sectors for both male and female employment (Korashi, 2021), accounting for almost a third of the industrial labor force (Ecorys, 2014). The industry is heavily dependent on global supply chains and distribution, both of which were disrupted by the COVID-19 pandemic. Currently, about 20% of global industrial water pollution is caused by dyeing and finishing textile products, which contain more than 72 toxic chemicals and microplastics (World Bank, 2014). In Egypt, the textile manufacturing sector (specifically the dyeing process) is also one of the largest producers of wastewater, contributing the heaviest organic load of industrial wastewater, at almost 52% (Malato et al., 2011). Associated costs of the sector include energy, water, chemicals and labor for the cultivation of natural fibers (e.g., cotton), manufacturing and distribution (including fossil fuel-based synthetic fibers), and the final disposal of waste.

To mitigate environmental damage, the Egyptian Cotton Project aims to enhance the sustainability, inclusiveness, and added value of the cotton value chain in Egypt (UNIDO, 2020). This project is being implemented by the MoTI, in cooperation with UNIDO and local and international private-sector stakeholders. Preliminary results in Egypt indicate that regenerated cotton yarn could save 25–69% of water consumption and 5–40% of energy, and achieve a 4–44% reduction of greenhouse gas emissions in comparison to virgin cotton yarns (UNIDO, 2020).

2.1.3 Cement sector

Cement production is a capital-intensive, energy-consuming sector with a large environmental

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footprint, accounting for 51% of CO_2 emissions from Egypt's IPPU sector in 2015 (EEAA, 2018; UNIDO, 2014), and 17.17% (4,950 GWh/yr) of total electricity consumption in Egypt's industry sector (Ministry of Electricity and Renewable Energy, 2018), with a total thermal energy consumption estimated at 245,927,985 GJ/year (UNIDO, 2014). The cost of energy represents between 50 to 70% of total production costs in Egypt's cement sector (Cement Industry Division, n.d.).

The cement best-practice guidelines (CSI, 2011; GCCA, 2018; UNIDO, 2014) recommend the following elements as key to the establishment of a circular economy in the sector: supplementary cementitious materials or blended cement, alternative fuels/raw materials, energy efficiency and waste heat recovery (WHR), and carbon offsetting (e.g. investment in renewable energy). Many of the possible solutions for this sector are aligned with the ongoing Low-Carbon Roadmap for the Egyptian Cement Industry project to reduce carbon emissions by 2030 (EBRD, 2016).

3. Policy Recommendations

3.1 Adopt a national strategy for circularity

Following the example of the high-level, long-term commitments of EU member states, the adoption of circularity is a commitment requiring political will on the part of a country's top leadership, which would in turn formulate a preliminary national vision for circularity and the scope of its application (e.g., across all economic sectors or specific sectors/sub-sectors), building on previous/existing national initiatives. It is therefore recommended that the government start by drafting a national strategy for circularity, following the 2016 planning guidelines of the GGGI. Employing a problem-solving approach to public policy development, the GGGI leverages its experience in developing circularity with numerous partner countries, such as Ethiopia, India, Indonesia, and the United Arab Emirates.

It is recommended that the Ministry of Planning and Economic Development, along with the MoTI (on behalf of the selected industrial subsectors), lead the drafting of a national strategy and oversee its application and implementation. Both ministries should start by establishing an inter-ministerial steering committee that reports to the prime minister and includes representatives from the ministries involved and the relevant sectors. The government should plan to draft the strategy over three phases: phase 1 - diagnosis and assessment (12–18 months), phase 2 - action planning (12 months), and phase 3 - implementation (five-year cycle).

3.2 Adopt specific measures for the three sectors

In the following subsections, we will identify the two or three most compelling measures the government should institute in each of the selected industries.

3.2.1. Plastics

a. The government should create a list of plastic products that will be eliminated or substituted within a defined timeframe, allowing for a probation period. Some of the most commonly used plastics that can be eliminated are single-use plastic bags, cutlery, plates, cups, and food containers. The government should stipulate in the executive regulations of the Waste Management Regulation Law a probation period (usually one–three years, but to be decided in consultation with the relevant stakeholders). It could also set minimum recycling or renewable input requirements for all products.

b. The government should encourage the manufacturing and promotion of alternatives to the banned items through clearly defined incentives and financial support packages (such as tax exemptions or deductions) and the issuing of new manufacturing regulations.

c. The government should also embark upon new projects that support the scaling up of mechanical or chemical recycling of old plastics and support businesses that produce renewable feedstock from

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biomass (such as agricultural or food waste) through dedicated financial support (e.g., subsidized loans) and technical assistance (e.g., capacity building for SMEs).

d. The government should launch awareness campaigns to promote the use of the new cleaner products, in partnership with concerned manufacturers. The government and new manufacturers should also involve the end user by encouraging them to re-use certain items through, for example, fees on single-use plastic and financial rewards for the encouraged behavior.

3.2.2 Textiles

a. The government should promote the use of recycled fibers to create a competitive market and encourage design for recyclability by incentivizing the use of recycled materials and/or disincentivizing the use of virgin materials in the form of EPR schemes. Taxes on virgin materials and low recyclability products could be used to finance subsidies to support circularity innovations and improve its economics.

b. The government should create an eco-label scheme for Egyptian textiles by drafting a set of standards for manufacturers. The standards should set sustainably sourced and safe materials, agricultural practices, labor conditions, recycled content, use of chemicals, water efficiency and pollution, energy use, microfiber leaching, durability, and recyclability. A pilot that develops a set of voluntary targets and standards for manufacturers willing to test drive the scheme could be formulated and incentivized before rolling out the scheme on the national level.

3.2.3 Cement

a. Policymakers should develop legislation to support the use of fuels that are less carbon-intensive in cement kilns. To address the shortages of alternative fuels in the market and further ensure the effective implementation of recent decrees and laws encouraging the use of alternative fuels, including Egypt's Municipal Solid Waste Management Strategy, adequate waste management infrastructure and collection efficiency should be in place. Economic incentives should be provided to private investors, such as attractive service and gate fees, expedited land allocation, low/zero land lease, and long contract duration sufficient to recover the high investments. The supply of waste to the facilities should be continuous, must reach a minimal nominal capacity, and must meet quality requirements of the cement plants in order to sustain the profitability of the alternative fuels business.

The EEAA's Waste Management Regulatory Authority should further ensure that the pricing of alternative fuels is attractive by imposing tipping fees, to be paid to waste management and cement companies per ton of waste treated/ co-processed.

The EEAA, in coordination with the MoTI, should require coal-fired power plants in Egypt to maintain a threshold of quality for fly ash, to allow its use as a clinker substitute. Moreover, the EEAA should declassify fly ash as a hazardous waste so it can be used as a cement component.

b. The government should issue the necessary standards and specifications to ensure the use of alternative raw materials in the construction market. The Ministry of Housing, Utilities and Urban Development and the MoTI should modify construction codes to include blended cement and license ready-mix plants to produce concrete from blended cement. Other supporting measures should be identified as well, such as training and qualification schemes to support architects, engineers, and construction companies in acquiring practical knowledge of the use of composite cement in reinforced concrete and construction.

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c. The government should put in place appropriate market surveillance mechanisms to ensure quality of performance to maintain confidence in the sustainable products. The government should provide economic incentives to improve the feasibility of energy efficient technologies, establishing attractive tariffs to sell generated electricity to the grid and/or instituting plant- or sector-level energy efficiency target-setting programs and national benchmarks.

d. The MoTI, in collaboration with the EEAA, should add to the operating permits of cement plants requirements to introduce energy management systems (e.g., ISO 15001), including adequate training of operating and maintenance personnel. These energy efficiency measures typically result in decreased electricity sales and profitability and therefore run counter to the business interests of electricity distribution companies. They should thus be linked to financial benefits, financed by the Ministry of Electricity, in order to receive political buy-in. Benefits could include fee-based energy efficiency services or investment in WHR installations run by distribution companies to generate a revenue stream, thereby offsetting any losses due to grid electricity decoupling. Additionally, sharing the carbon reductions could similarly motivate the Ministry of Electricity to support WHR projects, in recognition of its climate change mitigation efforts.

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