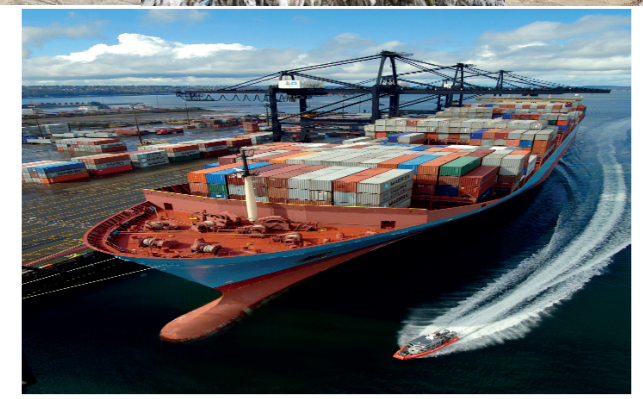
Summary

Plastic waste, Residue-derived fuel (RDF) and cement kilns Project





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Solid Waste Management:

The waste management system in the Arab Republic of Egypt faces numerous challenges that impact public health and environmental conditions. Key issues include unclear roles, weak planning and financing relationships, limited resources and human capabilities, and inadequate oversight. Proposed solutions involve establishing a clear administrative body for waste management, creating investment opportunities, and ensuring safe waste disposal practices.

Law No. 202 of 2020 plays a crucial role in addressing existing and emerging waste management issues. Integrating waste management aligns with Sustainable Development Goals and Egypt Vision 2030 objectives, emphasizing sustainable consumption patterns and pollution reduction.

Egyptian government policy:

Egypt aims to mitigate environmental and health risks associated with improper waste disposal through public awareness campaigns, waste separation strategies, recycling initiatives, and enhanced waste management practices. Collaboration with private entities, electronic waste recycling, and air quality monitoring are integral to these efforts.

As per coal usage licenses and import regulations for the cement industry, measures were enforced to address fuel alternatives, aiming to mitigate greenhouse gas emissions. Cement firms committed to specific percentages outlined in their environmental reports to ensure environmental compliance. Initial commitments varied from 5% to 15%, sometimes surpassing these figures, with a focus on meeting investment requisites for adherence.

The adoption of Refuse-Derived Fuel (RDF) is intended to reduce coal dependency and provide additional waste disposal capacity The RDF production process, subject to varying technologies across facilities, precedes its utilization in cement kilns. RDF serves as an interim measure until advanced energy production technologies like green hydrogen become prevalent.

The waste management system in Egypt faced several challenges, including:

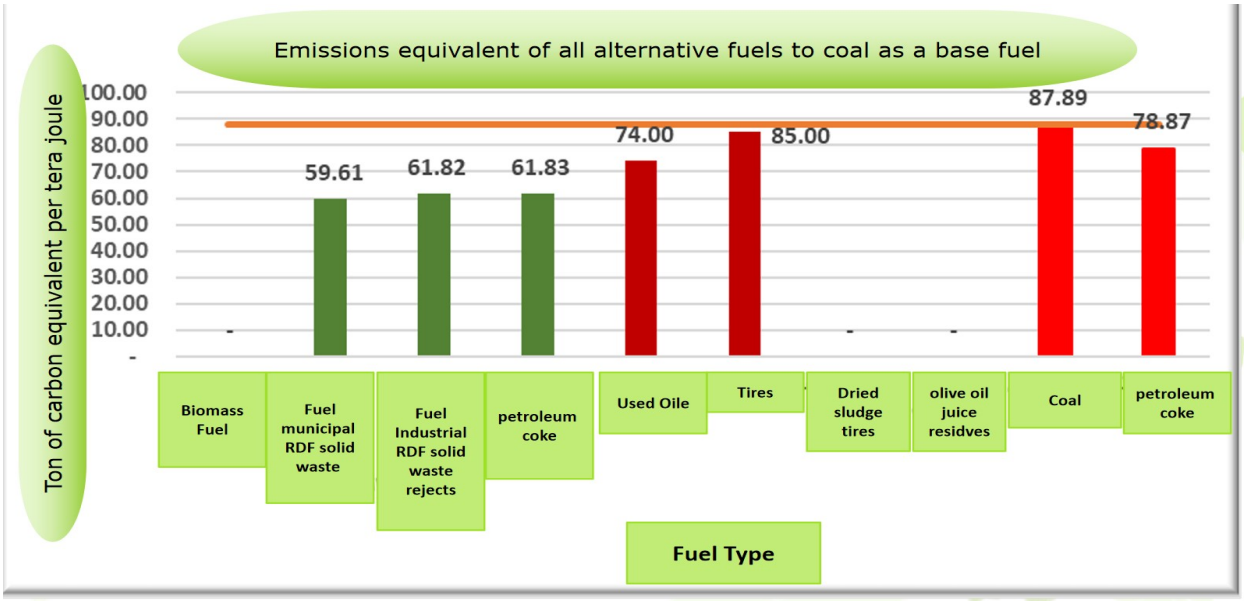
- Lack of clarity in roles and responsibilities, leading to overlap and entanglement
- Weak coordination between planning, financing, and cost recovery
- Insufficient financial resources and human capabilities to manage the system effectively
- Weak oversight and supervision of the waste management operations

This study clarifies that Refuse-Derived Fuel (RDF) is an alternative fuel source extracted from municipal waste post-treatment, tailored for high calorific values ranging between 10-12 (Calorific value). Primarily targeted toward the cement industry, RDF serves as a substitute for coal or petroleum, contributing to waste management efforts.

The production of RDF involves several stages that vary based on technology, culminating in its utilization in cement kilns as an alternative energy source. Egypt hosts numerous cement factories incorporating RDF into diverse production processes.

Currently, approximately 722,000 tons of RDF are generated annually from processing about 4.25 million tons of municipal solid waste. This process operates through 31 treatment lines handling 320 tons of waste daily across two shifts. (State of the Environment Report 2021)

The RDF production process hinges on the mechanical biological treatment of roughly 25 million tons of municipal waste annually. Achieving 100% waste collection efficiency at treatment facilities would streamline operations. Initial sorting, magnetic separation for metals, and sieving to isolate organic materials are key steps. Organic fertilizer is produced from the separated organic materials, with RDF constituting about 25% of treatable waste, undergoing drying and preparation for delivery to cement factories after thorough analysis.



Waste Management Regulatory Authority (WMRA) Report 2023

Egyptian Policy:

In a bid to enhance waste collection rates, secure essential funding for waste treatment, and align with the state's waste management strategy, Egypt aims to implement the Extended Producer Responsibility (EPR)Policy. This policy, widely adopted globally, holds producers accountable for managing products throughout their life cycle, especially during the post-consumption phase when they become waste. Manufacturers, importers, or distributors are designated as responsible entities based on product types, with specific implementation strategies tailored to each product category.

The report highlights the importance of the new Waste Management Law No. 202 of 2020 and its executive regulations, which aim to address previous challenges and emerging issues. The provisions of the law and its executive regulations are designed to enhance oversight and minimize violations in solid waste management, particularly concerning plastic waste. These measures will promote recycling efforts while ensuring that such activities are conducted safely and within factories approved by the Ministry of Environment. Also links the waste management issue to the sustainable

development goals, particularly Goal 12 on sustainable consumption and production, as well as Egypt's Vision 2030 and Africa's Agenda 2063.

Egypt is working to reduce the environmental and health impacts of unsafe waste disposal through various initiatives.

In the future, Egypt aims to establish robust frameworks for integrated management of waste, combatting unsafe waste disposal, and bolstering support for comprehensive waste management. Tightening control over cement factories, especially those that use derivative fuels, and obligating them to continuously measure chimney emissions, noting that these factories are connected to continuous monitoring stations at the Ministry of Environment and that any malfunction is reported The Egyptian government is actively working to reduce emissions in the cement industry, which historically relied on natural gas and diesel for kiln operations until 2014. The gradual removal of government subsidies and the limited availability of these fuels have rendered their use economically unfeasible. (National Ambient Air Pollutant Monitoring Network).

Amendments made in April 2015 to Law No. (4) of 1994 permitted Egyptian cement companies to transition to high-carbon-density fuels, such as coal and petroleum coke. This shift has resulted in a notable increase in carbon dioxide emissions, which rose by approximately 15%, equating to around 820 kg of CO2 per ton of cement produced. However, following Egypt's signing of the United Nations Framework Agreement on Climate Change in April 2016, the country committed to taking ambitious, long-term measures to reduce carbon dioxide emissions. In alignment with this commitment, the Egyptian Ministry of Environment has been enforcing the new coal regulation since April 2015. This regulation mandates that companies develop action plans outlining their strategies to mitigate carbon dioxide emissions. These initiatives serve as a robust incentive to enhance air quality and safeguard public health and the environment. They also hold companies their environmental responsibilities, ensuring the protection of natural resources and the preservation of their operational licenses.

Recommendations for Solid Waste Management and RDF:

- Waste Reduction: Prioritize minimizing waste generation before considering recycling or disposal options.
- Applying the waste management hierarchy (reduce, reuse, recycle, Recovery).

- Identify a clear administrative body responsible for organizing, monitoring, and overseeing all integrated waste management activities
- Create investment opportunities in the waste management sector and ensure safe management of all waste types
- Raising public awareness on waste separation from source and reduce the use of single-use plastic. Encourage them to use the safe alternatives.
- Compliance with International Standards: Amend local laws to align with the Basel Convention requirements. Cooperating with private companies and focusing on e-waste recycling
- Monitoring and measuring air quality in the work environment and commitment to wearing protective equipment.

Custom and HS System

Customs functions as a linchpin in expediting legitimate trade across international borders while concurrently combatting illicit activities. By deploying a suite of robust measures and leveraging automated controls, customs agencies enforce stringent protocols to uphold their mission of streamlining lawful trade, curbing illicit practices, and safeguarding society.

In the fight against transnational plastic waste crimes, customs enforce rigorous import regulations through a modernized and robust procedural framework. This system follows a structured sequence: shipment arrival, submission and inspection of documents, physical inspection of the shipment, application of customs procedures, and payment of taxes and fees, culminating in the release of the shipment.

Incoming shipments undergo multifaceted analyses overseen by competent regulatory bodies like the Export and Import Control Authority, responsible for issuing and scrutinizing permits and licenses for trade operations.

Specific to plastic waste and Refuse-derived fuel (RDF) imports, national laws proscribe their entry, prompting preventive and restrictive actions executed by customs authorities in adherence to the prohibition.

In cases where incoming shipments contravene customs and legislative norms, confiscation procedures are swiftly enacted, with options including destruction, re-exportation, or confiscation in favor of the relevant authority.

Further actions, including legal recourse for customs smuggling offenses, are pursued, with such cases being referred to investigative agencies for appropriate measures.

The current classification system within the Harmonized System concerning plastic waste, as delineated in Section VII,

chapter 39 under Customs Item 39.15, presents notable deficiencies. A primary drawback is the inadequacy of Item 39.15 to comprehensively categorize all types of plastic products. Notably, plastic items may be classified differently if mixed with other materials such as paper or textiles, leading to inconsistencies in classification. This variance results in inaccuracies when analyzing international trade data on plastic waste, underscoring a critical flaw in the existing system. Consequently, a restructuring of the plastic waste classification system within the Harmonized System's forthcoming version in 2028 is imperative.

Refuse-derived fuel (RDF), falling under Customs Item 3825.10 for municipal waste, commonly comprises a substantial portion of plastic waste.

Customs personnel encounter numerous obstacles and challenges, including:

- Challenges in accurately classifying plastic waste within the current Harmonized System.
- Instances of misclassification and misdeclaration of imported plastic types.
- Insufficient analysis laboratories under customs authority (Customs Lab) to oversee the analysis process, thereby impeding the accurate determination of customs items in alignment with the requirements outlined in customs item notes and those established by the Harmonized System.

Awareness and Training:

The project utilized various communication methods, including lectures and two training workshops titled "Integrated Solid Waste Management and the HS System" and "Plastic Waste and Derived Fuel and Cement Factories." These lectures encompassed all aspects of the project, with the training workshops complementing the opening and closing sessions. The webinar

focused on illegal trade, plastic waste management, and climate change mitigation was attended by 19 participants from Arab countries, including Egyptian Focal Points for the Basel and Stockholm Conventions, as well as experts from the Ministries of Health, Environment, and Industry.

Two brochures were developed to enhance awareness: one on "Integrated Solid Waste Management", the other about derived fuel, highlighting risk reduction strategies, and another featuring brief messages on minimizing plastic use and the local community's role in the waste management hierarchy. Additionally, a booklet was developed to educate stakeholders about the Harmonized System (HS) and customs procedures.

The project included the preparation of residential and industrial questionnaires, along with field visits to three companies—two cement manufacturers and a solid waste management plant that produced the compost and derived fuel RDF production. Four press releases were issued to emphasize the project's significance in assessing the current state of solid waste management, particularly concerning plastic waste Management and the reduction of single-use plastic, along with guidelines for monitoring and risk reduction in line with international standards. A video documenting the field visits was also produced.

All lectures and educational materials were shared on WhatsApp groups for journalists (34 members), experts (24 members), and Arab women (52 members), as well as on Facebook. A press interview featuring the project expert was published in two Egyptian newspapers.

Conclusion:

Egypt faces a significant challenge with the increasing volume of solid waste, driven by population growth and energy shortages, particularly in cement factories. The rising greenhouse gas emissions from coal and fossil fuel use

have prompted a shift towards substituting 10% of derived fuel in cement production. This transition includes a commitment to ongoing monitoring and measurement of emissions from chimneys to mitigate the release of persistent organic pollutants and carbon dioxide.

These chimneys are linked to continuous monitoring stations operated by the Ministry of Environment, ensuring compliance with environmental standards. Field visits revealed that many cement factories collaborate with foreign

partners, including those from Greece and Spain, and are dedicated to adhering to international standards. The factories actively monitor emissions and continuously seek to reduce greenhouse gases and their overall carbon footprint by employing modern technologies in the production and use of Refuse-Derived Fuel (RDF).

The initiative aims to promote sustainable development and a circular economy, with the 10% RDF integration serving as a transitional step towards reducing reliance on fossil fuels and coal, which contribute to elevated carbon emissions. Additionally, the Ministry of Environment has prohibited the import and export of derived fuels to further regulate this effort.

Recommendations:

Harmonized System Refinement:

•Urgently address the shortcomings in the current plastic waste classification system within the Harmonized System by restructuring it in the upcoming version of 2028 to ensure comprehensive and accurate categorization.

Enhanced Training:

•Provide specialized training for customs workers to improve their ability to classify plastic waste effectively and mitigate misclassification issues.

Laboratory Strengthening:

•Establish and equip dedicated analysis laboratories under customs authority to enhance oversight and ensure adherence to customs item specifications and Harmonized System regulations.

Collaborative Guide Development:

•Collaborate with the World Customs Organization and the International Trade Center to produce a specialized guide for the classification of plastic waste, aiding customs officers in inaccurate categorization.

•Implement a risk-based approach to plastic waste inspections, focusing on high-risk shipments prone to misclassification. Utilize data analytics, intelligence tools, and identification methods to target inspections effectively.

Enhanced Cooperation and Information Exchange:

•Foster collaboration and information sharing among customs authorities, environmental agencies, and relevant stakeholders to exchange insights and best practices concerning the plastic waste trade.

Development of a Centralized Database:

•Create a comprehensive central database containing plastic types and their corresponding HS codes to support customs officers in accurate classification processes.

Integration of Advanced Technologies:

•Utilize advanced technologies such as artificial intelligence and machine learning to bolster the classification process. These tools can analyze import data patterns, identify potential misclassifications based on historical data, and enhance classification precision

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- Harmonized System Schedule- Seventh Edition 2022
- Integrated Tariff Schedule

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Field visit:

1- Egyptian Company for Solid Waste Recycling - Ecaru Company:

2- Arabian Cement Company ACC in Ain Sokhna: