Extended Producer Responsibility (EPR) regarding Electronic and Electrical Waste in Palestine
(2024/001)

Roadmap for EPR – Waste of Electrical and Electronic Equipment in Palestine

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LIST OF ABBREVIATIONS AND ACRONYMS

AR	Authorized Representative
EPR	Extended Producer Responsibility
ESM	Environmentally Sound Management
EU	European Union
E-waste	Electronic Waste
HS	the Harmonized System
HS-Code	the Harmonized System Code
ITU	International Telecommunication Union
OECD	The Organization for Economic Cooperation and Development
POM	Placed on the Market
PRO	Producer Responsibility Organization
UN	United Nations
UNU-Keys	United Nations University Keys
WEEE	Waste of Electrical and Electronic Waste

Executive Summary

The "Roadmap for Extended Producer Responsibility (EPR) for Waste Electrical and Electronic Equipment (WEEE) in Palestine" outlines the strategic plan and necessary steps for implementing an EPR framework to manage E-waste effectively in Palestine.

Background and Objectives

The primary objective is to develop a sustainable and efficient system for managing E-waste, in alignment with global best practices. This includes defining responsibilities for stakeholders, setting targets for waste collection and recycling, and ensuring compliance with environmental regulations.

Current Status and Challenges

The current E-waste management system in Palestine is underdeveloped, characterized by informal recycling practices, limited public awareness, and inadequate regulatory frameworks. Key challenges include:

- Lack of specific legislation for E-waste.
- Insufficient data on E-waste quantities.
- Poor infrastructure for collection and recycling.
- Illegal smuggling of E-waste.

Strategic Framework for EPR Implementation

The roadmap proposes a collective approach through the establishment of a Producer Responsibility Organization (PRO) to manage E-waste. Key elements include:

- Registration of producers and importers.
- Implementation of a fee structure based on product types and weights.
- Development of public awareness campaigns.
- Establishment of formal recycling facilities.
- Integration of informal recyclers into the formal system.

International Experiences and Lessons Learned

The report reviews successful EPR implementations from the European Union, Japan, South Korea, Brazil, Rwanda and UAE, and other countries, highlighting key lessons such as the importance of clear legislation, stakeholder involvement, transparent fee structures, and public awareness campaigns.

Proposed Actions and Timeline

The roadmap outlines specific actions required for EPR implementation, including:

- Enhancing the Harmonized System (HS) for better E-waste data.
- Developing a toolkit for E-waste quantification.
- Formalizing the E-waste sector through registration and licensing.
- Strengthening border control to prevent illegal E-waste trade.
- Establishing environmental performance standards for EEE.
- Conducting public awareness campaigns.

The timeline for these actions spans from 2025 to 2027, with phased targets for recycling rates up to 2050.

Institutional Framework and Legal Requirements

The institutional framework involves multiple stakeholders, including government agencies, industry representatives, and NGOs. The PRO will act as a coordination body, ensuring compliance and facilitating collaboration. A comprehensive legal framework is recommended to mandate EPR requirements and support the overall sustainability of the E-waste management system.

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1. Background

1.1. Project of Strengthening the Institutional Capacity of the State of Palestine

Enhancing Extended Producer Responsibility (EPR) regarding electronic and electrical waste in Palestine is a consultancy activity for the benefit of the Palestinian Environmental Quality Authority, implemented during the year 2024. It includes two reports and a training program. This activity will support the development and improvement of proper management of electronic and electrical waste, including practices for the collection and recycling of electronic and electrical waste in Palestine.

This is the second report of the consultancy activity, which is about developing a roadmap/guidance document for Extended Producer Responsibility (EPR) concerning electronics and electrical materials, leading to their waste, and making implementation recommendations. The roadmap includes the following:

- Clearly defining the responsibilities of relevant stakeholders and concerned parties.
- Developing a classification system for electronic and electrical waste and identifying the main categories.
- Setting targets for the collection and recycling of waste, focusing on improving cooperation between companies and customers with a clear plan that outlines how companies (whether in a B2B or B2C model) can effectively collaborate within the framework of Extended Producer Responsibility. This plan includes defining the responsibilities of each party in the production, distribution, and recycling chain.
- Best practices and successful interventions from the beginning of the production or import chain to increase sector circularity.
- The legal and financial framework for regulating Extended Producer Responsibility for electronic and electrical waste and recommendations for applying and implementing the roadmap on Extended Producer Responsibility.
- Monitoring and reporting requirements (follow-up, control, and reporting) on the subject.
- Recommendations for applying the roadmap based on best practices and successful interventions.

1.2. Global Context of WEEE

The global electrical and electronic equipment production has seen exponential growth over the past few decades. Alongside this growth, the lifespan of such products has been decreasing, leading to an unprecedented increase in WEEE. According to the Global E-waste Monitor 2020, approximately 53.6 million metric tons of E-waste were generated worldwide in 2019, and this figure is projected to reach 74.7 million metric tons by 2030[1]. WEEE contains hazardous substances such as lead, mercury, and cadmium, which can pose severe risks to human health and

[1] Forti, V., Balde, C. P., Kuehr, R., & Bel, G. (2020). The Global E-waste Monitor 2020: Quantities, flows and the circular economy potential. United Nations University (UNU), United Nations Institute for Training and Research (UNITAR) – co-hosted SCYCLE Programme, International Telecommunication Union (ITU) & International Solid Waste Association (ISWA

the environment if not managed properly. Simultaneously, E-waste is rich in valuable materials like gold, silver, and copper, offering significant economic opportunities if efficiently recycled.

1.3. Objective

This report aims to provide a roadmap for the successful implementation of EPR for WEEE in Palestine, outlining the necessary legal, institutional, and operational frameworks. Palestine can develop a sustainable and effective WEEE management system that aligns with global best practices and contributes to a healthier and cleaner environment through a collaborative effort involving government agencies, producers, consumers, and other stakeholders.

1.4. Report Methodology

This report has been prepared based on the outputs of the first report on the status of electrical and electronic waste in Palestine, specifically the quantities of waste production and the economic activities associated with this sector in terms of collection and recycling, initiatives undertaken in the previous phase to advance the sector, analysis of key stakeholders, and identification of national needs. Based on global models studied in the first report on best practices that can be applied in Palestine, global practices regarding the application of Extended Producer Responsibility (EPR) for electrical and electronic materials leading to their waste were also studied and analyzed. The collected information on adopting and implementing Extended Producer Responsibility for electrical and electronic materials was used to develop an applicable roadmap in Palestine, especially since the main reliance is not on the production of these materials but on their import.

2. Current Status of the Electrical and Electronic Equipment Sector and Its Waste in Palestine - Summary

With its unique geopolitical and socio-economic context, Palestine faces distinct challenges in managing WEEE. The current waste management infrastructure is underdeveloped, and there is a lack of formal mechanisms for collecting, recycling, and disposing of E-waste. Informal recycling practices, often involving manual dismantling and open burning, are prevalent, leading to adverse environmental and health impacts. Additionally, public awareness regarding the hazards of WEEE and the benefits of proper disposal is limited[2].

The Environment Quality Authority has recognized the urgent need to address the WEEE problem and has initiated steps to develop policies and regulations to improve waste management practices. However, the implementation of these policies has been hindered by limited resources, technical expertise, and institutional capacity. The introduction of an EPR framework presents a viable solution to these challenges by ensuring that producers take responsibility for the entire lifecycle of their products.

The first project report provided an overview and analysis of the current status of the electrical and electronic equipment sector and its waste in Palestine. This chapter summarizes the key points from the report that relate to the roadmap.

2.1. The Electrical and Electronic Equipment Sector in Palestine

Imports are the main source of electrical and electronic equipment in Palestine and are subject to several systems and laws, the most important of which are:

- The Trade Law of 1966
- The Commercial Agents Law No. (2) of 2000
- The Customs and Excise Law No. (1) of 1962 and its amendments
- The Companies Law No. (42) of 2021
- The Public Procurement Law No. (8) of 2014 and its amendments
- The Telecommunications Law No. (3) of 1996

Relevant Regulatory Procedures are:

- The Ministry of National Economy has implemented an import license for goods under the quota system. This license allows a specified quantity of imported goods, including electrical appliances, at a reduced customs tariff negotiated in a trade agreement.
- The Ministry of Communications and Digital Economy issued instructions No. (1) in 2017 regarding type approval for telecommunications equipment, based on Law No. (3) of 1996 on telecommunications. Type approval aims to regulate the Palestinian market, protect consumers from non-compliant devices, and ensure that all suppliers of

[2] Environment Quality Authority (2024). Current Situation of Electrical and Electronic Waste in Palestine. Environmental Quality Authority, Ramallah, Palestine

telecommunications equipment in Palestine adhere to local and international standards and allowed frequencies.

- In 2015, the Palestinian Central Bureau of Statistics, in cooperation with the Ministry of Finance through the Customs Directorate and the Ministry of National Economy, developed and implemented a local version of the Harmonized System (HS) for describing and coding goods based on the international version and customs tariff[3].

Key Observations on HS Data:

- The HS database contains the financial value (in thousands of US dollars) of all goods imported or exported since the year, updated continuously.
- The database lists the country of export for each good. It should be noted that goods imported into the Israeli market by agents and then supplied to the Palestinian market are listed as imported from Israel.
- The Ministry of National Economy and the Palestinian Central Bureau of Statistics treat goods supplied to the Palestinian market as imports, while the Customs Directorate treats them as inter-trade, constituting the official part of inter-trade.
- Currently, there is no information on the quantities imported or any other data according to the customs declaration of the goods.

Inter-trade between the Palestinian and Israeli markets is complex due to restrictions on the movement of materials from the Israeli side to the Palestinian side and the possibility of smuggling in the opposite direction. However, a significant portion of this trade is conducted officially and documented with clearance invoices, especially for business transactions carried out through official agents or retailers. The situation is further complicated concerning electrical and electronic devices, as these items are supplied officially for new ones and mixed for used ones. Used devices are sold in the Palestinian market for two purposes:

- Direct use, especially refrigerators, air conditioners, fans, and kitchen appliances.
- As scrap to extract main metals and plastics, including all devices.

Analyzing the HS data shows that the average import value of electrical and electronic equipment from 2015-2022 is $721 million, while the average export value is $27 million.

The used trade is active in Qalqilya, Beit Awwa in Hebron, and Gaza, with several sales outlets in other cities such as Jenin, Nablus, and Qalqilya, where the trade is particularly active. There is no official statistics on the quantities of electrical and electronic devices supplied as used, even the part officially supplied with clearance invoices, as the customs declaration only includes a description of the shipment and its price.

[3] PCBS: https://www.pcbs.gov.ps/Portals/_PCBS/Class/Arabic/Economic/HarmonizedSystem-InfoPage

Palestinian Industries of Electrical and Electronic Equipment: Palestinian industries are mainly assembly industries and rely on importing raw materials, electrical boards, motors, and wires. The main products include[4]:

- Motors and generators
- Insulated wires and cables
- Electric lamps
- Electronic valves and tubes
- Television and radio receivers
- Primary cells and batteries
- Optical instruments manufacturing
- Medical equipment
- Orthopedic devices and measuring instruments
- Commercial display refrigerators and boilers

In 2012, Bisan Air Conditioning Factory was established with a capital of $2.5 million. It specializes in manufacturing wall, vertical, and central air conditioning devices and cooling systems. The factory currently produces 120,000 air conditioners per year and can produce 150,000 annually.

2.2. Electrical and Electronic Waste in Palestine

Electrical and electronic waste (E-waste) is a growing problem in Palestine due to the significant increase in the usage of electrical and electronic devices. The increase in E-waste is accompanied by the illegal smuggling of waste from inside to Palestinian territories, leading to substantial environmental and health challenges, as these devices contain hazardous materials such as heavy metals and toxic chemicals that can leak into the environment and negatively impact human health and wildlife. Despite these risks, E-waste management in Palestine is still in its early stages and faces many obstacles, including a lack of public awareness, regulatory frameworks, technical, and institutional capacities for sustainable waste management.

In this context, the Environmental Quality Authority seeks to develop its strategies and programs to include E-waste management, aiming to comply with environmental laws, reduce environmental and health risks, and promote recycling and sustainable resource use. These efforts include improving the legislative framework, increasing public awareness and education about the importance of proper waste management, and providing economically viable solutions such as extended producer responsibility, which will enhance the sector and develop the necessary infrastructure for waste collection and processing.

[4] Wafa Press. https://info.wafa.ps/userfiles/server/pdf/inds.pdf

Main Results of the First Project Report - The Status of Electrical and Electronic Waste in Palestine:

- The quantity of E-waste produced in 2022 from the consumption of new or used devices was estimated at 35,000-40,000 tons, making up about 2% of the total solid waste produced.
- The per capita waste generation rate was 7.3 kg per person in 2022, and it is expected to increase to 7.6 kg per person by 2030, totaling up to 50,000 tons.
- The quantity of recycled E-waste is more than 70,000-80,000 tons per year, 80-90% of which is smuggled, with about 10% ending up as final waste after extracting metals, electrical boards, and plastics, disposed of in main or random dumps or incinerated illegally.
- The quantity of damaged devices due to the Gaza aggression was estimated at 50,000 tons.

Key Challenges for Effective E-waste Recycling Sector Management:

- Lack of Regulation: The sector lacks registration or regulation of collection and recycling activities by official bodies or local authorities, leading to the absence of organized health and environmental management systems.
- Geographical Concentration: E-waste trade and processing are concentrated in the southern part of Hebron Governorate, where most waste comes from inside.
- Cross-Border Trade: Illegal trade of E-waste from inside to the West Bank continues despite international agreements and Palestinian laws, making it the primary source of waste in the area.
- Lack of Reliable Data: The absence of reliable data on the quantity of waste hinders the organization of an effective, economic, and transparent processing network.
- Primitive and Polluting Processing Operations: Waste is processed with inappropriate procedures and technologies, leading to significant pollution and raising serious environmental concerns.
- Unsafe Working Conditions: Workers in most recycling workshops operate under unsafe conditions without appropriate occupational safety and health measures.

2.3. Classification of Electrical and Electronic Waste

Product and E-waste classification systems were presented, focusing on the Harmonized System (HS) and other classifications such as the European Union classification, United Nations University (UNU) keys, and the Basel Convention. It was recommended that a suitable classification for Palestine be adopted based on the common features of electrical and electronic devices, considering their recyclability and processing as groups, relying on the EU-6[5]

[5] European Union. (2018). Directive (EU) 2018/851 of the European Parliament and of the Council of 30 May 2018 amending Directive 2008/98/EC on waste. Official Journal of the European Union, L150, 109-140. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32018L0851

classification (Table 1). The proposed Palestinian classification code (PWEEE) for electrical and electronic waste aligns with the UNU-KEYS classification[6] (Table 2).

Table 1. Palestinian Key (PWEEE) for Electrical and Electronic Waste

Palestinian Key	Category (Group)	Examples of Included Devices	Description / Contents	Recycling / Metal and Component Recovery
PWEEE1	Heat Exchange Devices	Refrigerators, Freezers, Air Conditioners	• Used for temperature regulation • Contains coolants and special chemicals • Components like compressors and evaporators • Metals (copper, aluminum) • Plastics	• Safe separation and treatment of coolants and fluorinated gases • Extraction of metals (copper, aluminum) • Recovery of plastics • Recycling of motors and mechanical components
PWEEE2	Screens and Devices with Screens	Televisions, Computer Monitors, Laptops, Tablets	• Contains display screens • Valuable materials like LCD and LED • Various metals • Hazardous materials like mercury	• Extraction of screens and valuable materials like precious metals (gold, silver) • Handling hazardous materials (mercury) • Recycling of plastics and glass

[6] Forti, V., Baldé, C.P., Kuehr, R. (2018). E-waste Statistics: Guidelines on Classifications, Reporting and Indicators, second edition. United Nations University, ViE – SCYCLE, Bonn, Germany.

Palestinian Key	Category (Group)	Examples of Included Devices	Description / Contents	Recycling / Metal and Component Recovery
PWEEE3	Lamps	Fluorescent Lamps, LED Lamps, Incandescent Bulbs	• Various types of lighting devices • Some lamps contain hazardous materials like mercury	• Separation of hazardous materials like mercury • Recycling of electronic components • Extraction of valuable materials like phosphorus from fluorescent lamps
PWEEE4	Large Appliances	Washing Machines, Dishwashers, Large Printers, Vending Machines	• Large household or industrial devices • Various metals • Plastics • Hazardous components like capacitors	• Dismantling devices to separate metals (iron, copper) and plastics • Recycling of motors and mechanical components • Handling hazardous components like capacitors
PWEEE5	Small Appliances	Toasters, Vacuum Cleaners, Electrical Kitchen and Restaurant Tools	• Small household or office devices • Various materials like plastics • Metals • Hazardous materials like batteries	• Dismantling devices to separate recyclable materials • Handling batteries and hazardous materials • Recycling of plastics

Palestinian Key	Category (Group)	Examples of Included Devices	Description / Contents	Recycling / Metal and Component Recovery
				and metals (copper, aluminum)
PWEEE6	Information and Communication Technology Devices	Mobile Phones, Routers, GPS Devices, Computers	• Integrated devices for communication and data processing • Precious metals like gold and silver • Hazardous materials like lead and cadmium	• Extraction of precious metals (gold, silver) • Separation of batteries and hazardous materials (lead, cadmium) • Recycling of electronic components and plastics

Table 2. Details of the Recommended Palestinian Code (PWEEE) for Electrical and Electronic Devices with Linkage to United Nations Keys.

Palestinian Key PWEEE	Category (Group)	Included Devices	United Nations Key UNU-Key
1	Heat Exchange Devices	Refrigerators (including built-in refrigerators)	0108
		Freezers	0109
		Air Conditioners (fixed and portable household)	0111
		Other Air Conditioners (dehumidifiers, thermal dryers)	0112
		Professional Cooling (large air conditioners and cooling displays)	0113
		Cooled Dispensers (vending machines, cold drink dispensers)	1002
2	Screens and Devices with Screens	Laptops (including tablets)	0303
		Cathode Ray Tube (CRT) Monitors	0308
		Flat Panel Displays (LCD, LED)	0309
		CRT Televisions	0407

Palestinian Key PWEEE	Category (Group)	Included Devices	United Nations Key UNU-Key
		Flat Panel Televisions (LCD, LED, Plasma)	0408
3	Lamps and Lighting Devices	Small Lamps (excluding LED and incandescent)	0501
		Compact Fluorescent Lamps (CFL)	0502
		Straight Tube Fluorescent Lamps	0503
		Special Lamps (e.g., professional mercury, high and low pressure sodium)	0504
		LED Lamps (including integrated LED lamps)	0505
4	Large Appliances	Central Heating Units (household installed)	0001
		Photovoltaic Panels (including inverters)	0002
		Professional Heating and Ventilation (excluding cooling equipment)	0101
		Dishwashers	0102
		Kitchen Equipment (e.g., large ovens, cooking equipment)	0103
		Washing Machines with Dryers	0104
		Clothes Dryers with Centrifuges	0105
		Household Heating and Ventilation (e.g., extractors, fans, heaters)	0106
		Professional IT Equipment (servers, routers, data storage, copying devices)	0307
		Professional Tools (for welding, bonding, grinding)	0602
		Entertainment Equipment (e.g., exercise, sports equipment)	0703
		Professional Medical Equipment (hospitals, dentists, diagnostics)	0802
		Professional Monitoring and Control Equipment (labs, control panels)	0902
		Non-cooled Dispensers (vending machines, hot drinks, tickets, money)	1001
5	Small Appliances	Microwave Ovens (including built-in, excluding grills)	0114

Palestinian Key PWEEE	Category (Group)	Included Devices	United Nations Key UNU-Key
		Other Small Appliances (e.g., small fans, irons, clocks, transformers)	0201
		Food Preparation Appliances (toasters, grills, food processors, fryers)	0202
		Hot Water Appliances (coffee, tea makers, water cookers)	0203
		Vacuum Cleaners (excluding industrial)	0204
		Personal Care Appliances (e.g., toothbrushes, hair dryers, shavers)	0205
		Small Consumer Electronics (headphones, remote controls)	0401
		Portable Audio and Video Devices (MP3 players, e-readers, car navigation)	0402
		Musical Instruments, Radios (including audio devices)	0403
		Video Devices (e.g., VCRs, DVD players, Blu-ray, digital receivers)	0404
		Speakers	0405
		Cameras (video cameras, still cameras, digital cameras)	0406
		Household Lighting Units (including incandescent and LED fixtures)	0506
		Professional Lighting Units (offices, public spaces, industry)	0507
		Household Tools (drills, saws, high-pressure cleaners, lawn mowers)	0601
		Toys (race car sets, electric trains, musical toys, bike computers)	0701
		Home Medical Equipment (thermometers, blood pressure monitors)	0801
		Household Monitoring and Control Devices (alarms, thermostats, smoke detectors)	0901

Palestinian Key PWEEE	Category (Group)	Included Devices	United Nations Key UNU-Key
6	Information and Communication Technology Devices	Small IT Devices (routers, keyboards, external drives, accessories)	0301
		Desktop Computers (excluding monitors and accessories)	0302
		Printers (scanners, multifunction printers, fax machines)	0304
		Communication Devices (cordless phones, answering machines)	0305
		Mobile Phones (including smartphones and pagers)	0306
		Game Consoles	0702

2.4. Recommendations and National Needs

The first project report recommended leveraging international experiences, as enhancing E-waste management in a short period can be achieved by relying on successful global practices and best practices, as well as benefiting from potential international cooperation through environmental agreements. Additional recommendations include:

Table 3. Recommendations for Improving the Legal and Regulatory Framework for E-waste Management in Palestine.

Recommendation	Details
Development of Comprehensive Legislation and Regulations	• Issue specific regulations for electronic and electrical waste • Develop executive regulations to support the new system
Enhancement of the Regulatory Framework	• Establish a national strategy and plan for managing the electrical and electronic devices sector and its waste, with clear roles and responsibilities for government agencies • Create the National Committee for Hazardous Waste to oversee the management of electronic and electrical waste
Enhancement of Extended Producer Responsibility (EPR)	• Implement the principle of extended producer responsibility for electrical and electronic devices and their waste • Coordinate with importers to organize their work, including EPR requirements Provide incentives for producers to design recyclable products

Recommendation	Details
Development of Infrastructure	• Establish modern recycling and electronic waste treatment facilities • Provide financial and technical support for small and medium-sized enterprises
Enhancement of Institutional Capacities	• Organize training programs for government employees and stakeholders • Develop monitoring and reporting systems to track waste flows
Enhancement of International and Regional Cooperation	• Strengthen cooperation with neighboring countries and international organizations • Participate in international programs and projects focused on waste management
Increase Awareness and Education	• Launch national awareness campaigns • Include topics related to E-waste management in educational curricula
Stimulation of the Private Sector	• Provide tax incentives for companies investing in environmentally friendly technologies • Simplify procedures for obtaining licenses and permits Activate public-private partnerships
Establishment of an Environmental Information System	• Develop a national database including all information related to electrical and electronic waste • Enhance data transparency and ensure accessibility
Strengthening Law Enforcement	• Enhance inspection and monitoring mechanisms • Impose deterrent penalties on violators
Development of Emergency Plans	• Prepare a national emergency plan to deal with hazardous and electronic waste incidents
Encouragement of Innovation and Research	• Support research and development in the fields of electronic and electrical waste management • Provide grants and awards for innovations that contribute to waste reduction

3. The Extended Producer Responsibility (EPR) for Electrical and Electronic Equipment and Their Wastes

3.1. Background

The rapid technological advancements and the growing consumer demand for electrical and electronic equipment (EEE) have significantly contributed to the increased global production of electronic waste, commonly known as (E-waste) or Waste of Electrical and Electronic Equipment (WEEE). E-waste poses a multifaceted challenge, encompassing environmental, health, and economic dimensions. Like many other regions, Palestine must develop a sustainable and efficient approach to managing WEEE. This report, titled "Roadmap for Extended Producer Responsibility (EPR) for Electrical and Electronic Equipment (EEE) and their Wastes in Palestine," aims to provide a roadmap for implementing EPR as a strategic tool to address the WEEE challenge in Palestine.

The concept of Extended Producer Responsibility (EPR) transfers the responsibility of managing end-of-life products from consumers and involved entities to the producers or their representatives, such as import conditions. Thus, it incentivizes producers to design environmentally friendly products and establish efficient collection and recycling systems.[7]

Given the continuous increase in the use of electronic and electrical devices, there is an urgent need to find safe and sustainable mechanisms for disposing of the waste generated by these devices. This report provides practical recommendations for the effective implementation of EPR and identifies key stakeholders. Implementing EPR policies, particularly in the field of electronic and electrical waste in Palestine, is a necessary step towards enhancing environmental sustainability, effective resource management, waste management practices, reducing environmental pollution, and promoting a circular economy.

3.2. Historical Background

The origins of EPR trace back to the Swedish Thomas Lindhqvist, who 1990 proposed to the Swedish Ministry of the Environment on behalf of Lund University the idea that the manufacturer should be responsible for its products. Lindhqvist defined EPR in a 1992 report as: "Extended Producer Responsibility is an environmental protection strategy to achieve an environmental objective of reducing the overall environmental impact of a product, by making the product's manufacturer responsible for the entire lifecycle of the product, especially for the take-back, recycling, and final disposal of the product. Extended Producer Responsibility is implemented through administrative, economic, and informative tools. The composition of these tools determines the precise form of Extended Producer Responsibility."[8]

[7] Organisation for Economic Co-operation and Development. (2001). Extended Producer Responsibility: A Guidance Manual for Governments. OECD Publishing.

[8] Lindhqvist, T. (2000). Extended Producer Responsibility in Cleaner Production: Policy Principle to Promote Environmental Improvements of Product Systems. [Doctoral Thesis (monograph), The International Institute for Industrial Environmental Economics]. IIIEE, Lund University.

Lindhqvist's proposal came at a time when many European countries had begun to develop strategies to improve the management of end-of-life products. This led nearly all members of the Organization for Economic Co-operation and Development (OECD) to adopt EPR policies to prevent pollution and reduce waste.

In 1991, Germany provided the first example of EPR in Europe regarding plastic waste, requiring manufacturers to take responsibility for recycling or disposing of the packaging materials they sell. The German industry created a "dual system" for waste collection, where household plastic packaging is collected alongside municipal waste collection.[9]

In Palestine, applying this concept can help reduce the environmental damage caused by the accumulation of electronic waste by encouraging companies to adopt more sustainable practices, develop less harmful products, and fulfill their obligations in this context. This approach can also stimulate the creation of local recycling industries, create job opportunities, contribute to local economic growth, and raise environmental awareness among consumers and companies alike. Accordingly, the Environmental Quality Authority aims to assess the current state of electronic and electrical waste in Palestine, develop a roadmap for implementing EPR for electronic and electrical waste, and promote the culture of a circular and green economy, in addition to responding to the requirements of environmental agreements signed by the State of Palestine. Consequently, through consultants, the Environmental Quality Authority is studying the feasibility of implementing the EPR concept through two projects: plastic waste and electronic and electrical waste (this project).

3.3. Importance of EPR in E-WASTE Management

Extended Producer Responsibility (EPR) is a policy approach that holds producers accountable for the environmental impacts of their products throughout the product's lifecycle, from design to disposal. EPR encourages producers to develop more sustainable products, establish take-back programs, and invest in recycling infrastructure. By shifting the financial and operational burden of waste management from municipalities to producers, EPR promotes a more efficient and sustainable waste management system. This approach aims to[10]:

- Encourage eco-friendly design: Manufacturers are incentivized to design products that are easier to recycle, contain fewer hazardous materials, and have a longer lifespan.
- Improve waste management: EPR programs typically involve producers in collecting and recycling their products, which can lead to more efficient and environmentally sound waste management practices.

[9] GIZ.. Extended Producer Responsibility for Packaging Waste Management: Involving All Actors in Plastic Pollution Sectors and Achieving Packaging. Retrieved from https://www.giz.de/de/downloads/GIZ-Responsabilite%CC%81%20Elargie%20Ar.pdf

[10] Organisation for Economic Co-operation and Development. (2001). Extended Producer Responsibility: A Guidance Manual for Governments. OECD Publishing.

The idea of EPR is based on the participation of manufacturers of these devices in bearing the responsibility for the lifecycle of their products by contributing to the processes of collecting and recycling electronic waste in a way that ensures environmental preservation through several technical and financial means[11], including:

1. Design environmentally friendly and recyclable products, focusing on reducing the use of easily recycled materials and minimizing the use of toxic materials in manufacturing that may be emitted during use or at the end of the product's life.
2. Develop programs to reclaim old products from consumers, such as exchange or return programs, where consumers can return their old products for discounts or other benefits.
3. Support special collection centers for electronic waste and provide the necessary infrastructure to facilitate the initial collection and sorting processes.
4. Manufacturers or their representatives collaborate with local recycling facilities to ensure their waste is processed sustainably and efficiently.
5. Providing financial or technical support for collection and recycling initiatives, such as funding research in advanced recycling technologies, supporting environmental awareness programs, and publishing periodic reports on the quantities of waste collected and recycled.

Since most electrical and electronic devices are imported, this project will consider whether the responsibility to ensure the effective application of the EPR concept should be extended to the supply chain or guaranteed by the producer.

Implementing EPR in Palestine can lead to several benefits, including:

- Improved collection and recycling rates for E-WASTE.
- Reduction in environmental pollution and health hazards associated with improper E-waste disposal.
- Conservation of natural resources through enhanced recycling and material recovery.
- Economic opportunities in the recycling sector, creating jobs and fostering innovation.

3.4. Circular Economy and EPR

The circular economy aims to eliminate waste and keep resources in use for as long as possible through strategies like designing for longevity, reuse, repair, refurbishment, and recycling. Here's how the EEE lifecycle can be restructured for a circular economy[12]. EPR is a vital tool in promoting the principles of the circular economy. By incentivizing producers to develop products

[11] Silva, A., & Mahjoub, O. (2020). Extended Producer Responsibility: Designing Policies for Sustainable Waste Management. United Nations Environment Programme.

[12] Ellen MacArthur Foundation. (2015). Towards a Circular Economy: Business Rationale for an Accelerated Transition. Retrieved from https://ellenmacarthurfoundation.org/towards-a-circular-economy-business-rationale-for-an-accelerated-transition

that are easier to recycle, repair, and reuse, EPR facilitates the shift from a linear to a circular model of production and consumption[13].

3.5. Bros and Cons of Extended Producer Responsibility (EPR)

While EPR for E-WASTE offers significant environmental, economic, and social benefits, its successful implementation requires overcoming various challenges related to regulatory complexity, economic costs, market dynamics, stakeholder coordination, and consumer behavior[14].

General Positive and negative aspects, pros and cons, of adopting and applying the Extended Producer Responsibility (EPR) for Waste of Electrical and Electronic Equipment (E-WASTE) are:

Table 4. Positive and negative sides of the EPR implementation.

#	Dimension	Pros	Cons
1	General	○ Reduction in Pollution: EPR policies encourage proper disposal and recycling of E-WASTE, reducing environmental pollution caused by hazardous substances found in E-waste. ○ Resource Conservation: Promotes the recovery and reuse of valuable materials like gold, silver, and copper, conserving natural resources and reducing the need for mining new raw materials.	○ Developing and implementing EPR schemes can be complex, requiring significant administrative and regulatory efforts. ○ Need for Collaboration: Effective EPR schemes require cooperation between various stakeholders, including government agencies, producers, consumers, and waste management companies, which can be difficult to achieve.
2	Economy	○ Cost Savings for Municipalities: Shifts the financial burden of E-waste management from local governments to producers, freeing up municipal resources for other public services.	○ Initial Costs for Producers: Producers may face increased costs associated with the collection, recycling, and disposal of E-WASTE, which could lead to higher consumption prices.

[13] Jensen, K. Extended Producer Responsibility: Key Points and Its Role in Forging a Circular Economy. LinkedIn. Retrieved from https://www.linkedin.com/pulse/extended-producer-responsibility-key-points-role-forging-jensen-iqwhf#:~:text=EPR%20is%20a%20vital%20tool,model%20of%20production%20and%20consumption

[14] EPR Recycling. (2021). Analysis of Extended Producer Responsibility Schemes. Retrieved from https://erp-recycling.org/wp-content/uploads/sites/39/2021/07/adelphi_study_Analysis_of_EPR_Schemes_July_2021.pdf

#	Dimension	Pros	Cons
		○ Market Development: Stimulates the recycling industry by creating demand for recycled materials and supporting recycling infrastructure development.	○ Investment in Infrastructure: Significant investments in recycling and waste management infrastructure may be required, particularly in regions with underdeveloped systems.
3	Market Dynamics	○ Eco-Friendly Design: Encourages producers to design products that are easier to recycle, contain fewer hazardous substances, and have a longer lifespan, contributing to sustainable production practices.	○ Potential for Monopolies: Large producers may have more resources to comply with EPR regulations, potentially disadvantaging smaller companies and leading to reduced competition. ○ Unintended Consequences: Producers may pass on the additional costs to consumers, making electronic products more expensive and potentially leading to reduced consumer demand.
4	Compliance and Accountability	○ Producer Responsibility: Holds producers accountable for the entire lifecycle of their products, ensuring they take responsibility for the end-of-life management of their goods. ○ Clear Regulations: Provides a clear regulatory framework that sets out the responsibilities of producers, creating a level playing field and reducing the likelihood of illegal dumping.	○ Ensuring compliance with EPR regulations can be challenging, necessitating robust monitoring and enforcement mechanisms. ○ Informal Sector Impact: In regions with a significant informal recycling sector, EPR implementation might disrupt existing practices and livelihoods, requiring careful transition planning.
5	Public Awareness	○ Increased Awareness: Educates consumers about proper E-waste disposal and recycling, leading to higher participation rates in take-back programs.	○ Consumer Participation: Success of EPR depends on consumer participation in take-back programs, which may be low due to lack of awareness or convenience.

4. International Successful Experiences of Applying EPR for E-WASTE

Worldwide, 81 countries (42% of the total) currently have an E-waste policy, legislation, or regulation in place; 67 of them applied the EPR principle, 46 have enshrined national E-waste collection targets in their regulations, and 36 have done so for E-waste recycling targets at the national level. For the number of countries that have policies, legislations, and regulations, the current percentage falls short of the International Telecommunication Union (ITU) target of 50% (97 countries) by 2023. Unfortunately, Palestine is one of the 97 countries that have no regulations or legislation for E-waste, so no EPR scheme has been adopted so far.

Below are tables summarizing selected international successful experiences in applying the EPR for E-WASTE, providing an overview of the implementation schemes and the general lessons learned. However, there is no single mechanism to implement the EPR mechanism due to different legislations and real conditions in each country. Later in this chapter, common lessons learned for Palestine are listed.

4.1. European Union (EU)[15]

Overview	• The EU has been a pioneer in implementing EPR for WEEE through the • WEEE Directive (Directive 2012/19/EU). The directive mandates producers to finance electronic waste collection, treatment, and recycling.
Implementation	• The EU's approach includes setting specific collection and recycling targets, creating producer responsibility organizations (PROs), and establishing a comprehensive tracking and reporting system.
Lessons Learned	• Clear Legislation and Targets: Establish clear legal requirements and measurable targets. • Producer Responsibility Organizations: Facilitate the creation of PROs to manage the logistics of collection and recycling. • Data and Reporting: Implement robust data collection and reporting mechanisms to track progress.

4.2. Japan[16]

Overview	• Japan’s Home Appliance Recycling Law (HARL) covers four major appliances: air conditioners, televisions, refrigerators, and

[15] European Commission. (2020). Waste Electrical & Electronic Equipment (WEEE). Waste from Electrical and Electronic Equipment (WEEE) - European Commission (europa.eu)

[16] Ministry of the Environment, Japan. (2020). Home Appliance Recycling Law.

	washing machines. Producers are responsible for recycling these appliances.
Implementation	• The law requires retailers to collect used appliances when new ones are purchased, and producers to recycle them. Recycling fees are visible to consumers, promoting awareness.
Lessons Learned	• Retailer Involvement: Involve retailers in the collection process to ensure convenient return options for consumers. • Transparency in Fees: Make recycling fees transparent to increase consumer awareness and participation.

4.3. South Korea[17]

Overview	• South Korea's Act on Resource Circulation of Electrical and Electronic Equipment and Vehicles mandates producers to recycle a certain percentage of their products.
Implementation	• Producers must meet specific recycling rates and non-compliance results in significant fines. The government supports the development of recycling infrastructure and promotes eco-design.
Lessons Learned	• Mandatory Recycling Rates: Set mandatory recycling targets to drive compliance. • Government Support: Provide government support for infrastructure and eco-design initiatives.

4.4. United States[18]

Overview	• The US employs a decentralized approach, with different states having their own electronic EPR laws. States like California, Maine, and Washington have established successful EPR programs.
Implementation	• State-level programs require producers to finance and manage the collection and recycling of E-waste. Public-private partnerships and incentives for consumers to return E-waste are common.
Lessons Learned	• State-Level Flexibility: Allow for flexible, state-specific solutions tailored to local conditions.

[17] Ministry of Environment, South Korea. (2020). Resource Circulation Act. me.go.kr.
[18] United States Environmental Protection Agency. (2021). Electronics Donation and Recycling. epa.gov.

	• Public-Private Partnerships: Foster collaborations between government and private sector to enhance program efficiency.

4.5. India[19]

Overview	• India's E-waste (Management) Rules, 2016, make producers responsible for collecting E-waste and ensuring its proper disposal.
Implementation	• The rules mandate producers to set up collection centers or take-back systems and meet specific collection targets. The government also promotes the formalization of the informal recycling sector.
Lessons Learned	• Formalization of Informal Sector: Integrate informal recyclers into the formal system to improve efficiency and safety. • Producer Collection Targets: Set specific collection targets for producers to ensure accountability. • Public-Private Partnerships: Foster collaborations between government and private sector to enhance program efficiency.

4.6. Brazil[20]

Overview	• Brazil's National Policy on Solid Waste (PNRS) includes EPR as a key component for managing E-waste.
Implementation	• Producers are required to develop reverse logistics systems for the collection and proper disposal of E-waste. The government provides guidelines and incentives for compliance.
Lessons Learned	• Reverse Logistics Systems: Develop efficient reverse logistics systems for the return and recycling of E-waste. • Government Incentives: Use government incentives to encourage compliance and innovation in waste management.

4.7. United Arab Emirates (UAE)[21]

[19] Ministry of Environment, Forest and Climate Change, India. (2016). E-waste (Management) Rules. moef.gov.in.
[20] Ministry of Environment, Brazil. (2010). National Policy on Solid Waste. mma.gov.br.
[21] Ministry of Climate Change and Environment, UAE. (2020). Waste Management. moccae.gov.ae.

Overview	• The UAE has introduced regulations to manage E-waste, including EPR schemes as part of its broader waste management strategy.
Implementation	• Producers are required to take responsibility for the end-of-life management of their products, including collection, recycling, and safe disposal. Public awareness campaigns support these efforts.
Lessons Learned	• Comprehensive Strategy: Integrate EPR into a broader national waste management strategy. • Public Awareness Campaigns: Use public awareness campaigns to educate consumers and promote proper E-waste disposal.

4.8. Rwanda[22]

Overview	• Rwanda has developed a national E-waste management strategy that includes EPR principles, making it one of the leaders in Africa, though not yet implemented.
Implementation	• The strategy involves the establishment of a formal E-waste recycling facility, public-private partnerships, and community engagement programs.
Lessons Learned	• Public-Private Partnerships: Leverage public-private partnerships to build and operate recycling facilities. • Community Engagement: Engage local communities to increase awareness and participation in E-waste management programs.

4.9. Basel convention

As a party to the Basel Convention, Palestine can benefit from employing the Environmentally Sound Management (ESM) Toolkit, a set of practical tools designed to assist parties and other stakeholders in achieving environmentally sound management of hazardous and other wastes.

The tools included in the toolkit have a strong practical focus and are designed to provide guidance on various aspects, such as addressing environmentally sound waste management in the informal sector, developing effective strategies to achieve recycling and resource recovery from waste, and practical guidelines on Extended Producer Responsibility (EPR) and funding waste management projects.

4.10. Summary of Learned Lessons and Requirements for the Implementation of Extended Producer Responsibility (EPR) in Palestine

[22] Ministry of Environment, Rwanda. (2021). National E-waste Management Strategy. environment.gov.rw.

A summary of learned lessons from the international experience for implementing successful Extended Producer Responsibility (EPR) on Waste of Electrical and Electronic Equipment (E-WASTE), in addition to the requirements based on the analysis of the current E-waste situation in Palestine, are given below:

Table 5. Learned Lessons and Requirements for Implementing Extended Producer Responsibility (EPR) in Palestine.

Aspect	Lessons Learned	Requirements
Legislative Framework	• Clear Legislative Framework: Establish specific recycling and collection targets and enforce mandatory compliance with penalties for noncompliance.	• Clear Legislation: Establish comprehensive laws and regulations that define the roles and responsibilities of all stakeholders, including producers, importers, retailers, consumers, and waste management companies.
Stakeholder Involvement	• Retailer Participation: Engage retailers in the collection process to ensure convenient drop-off points for consumers.	• Stakeholder Involvement: Form multistakeholder committees involving government, industry, and civil society to guide and monitor EPR implementation.
Transparency and Public Awareness	• Visible Fees: Implement transparent recycling fees to raise consumer awareness and participation.	• Public Campaigns: Conduct public awareness campaigns to educate consumers on the importance of proper E-waste disposal and pay the fees for example EPR
Infrastructure and Capacity Building	• Develop Recycling Facilities: Invest in developing formal recycling facilities with government support.	• Capacity Building: Invest in capacity building for government officials, waste management entities, and other stakeholders to manage EPR processes effectively.
Robust Data Management	• Tracking and Reporting Systems: Implement comprehensive tracking and reporting systems to monitor progress and ensure accountability.	• Data Management: Develop a comprehensive database to collect and manage data on EEE production, consumption, and waste generation.
Flexibility and Local Adaptation	• Tailored Solutions: Develop flexible solutions tailored to local conditions and needs.	• International Cooperation: Study and adapt best practices from countries with successful EPR programs, such as the European Union, Japan, and South Korea.

Aspect	Lessons Learned	Requirements
Financial Mechanisms	• EPR Fees: Implement a fee structure where producers pay into a fund based on the amount and type of EEE they place on the market.	• Financial Mechanisms: Provide financial incentives and subsidies to support the development of recycling infrastructure and encourage ecofriendly product design.
Collection and Recycling Infrastructure	• Integrate Informal Sector: Incorporate informal recyclers into the formal system through training and certification programs.	• Efficient Collection Systems: Develop a network of convenient and accessible collection points for consumers to return their end-of-life EEE.
International and Regional Cooperation	• Enhance Regional Cooperation: Engage in regional cooperation with neighboring countries to harmonize EPR policies and facilitate cross-border management of E-waste.	• International Cooperation: Support cooperation with other countries to exchange knowledge, technology, and financial resources to enhance recycling and waste management capabilities.
Education and Public Programs	• Educational Programs: Develop educational programs in schools and communities to promote sustainable consumption and waste management practices.	• Consumer Awareness: Implement campaigns to educate consumers on the importance of proper E-waste disposal and the benefits of recycling.
Research and Development	• Support Research and Development: Promote research in recycling technologies, eco-design, and sustainable product lifecycle management.	• Innovation and Technology: Enhance innovation and use technologies such as AI to manage E-waste and improve sorting and resource recovery processes.

5. EPR Mechanism

5.1. Elements of EPR

Producer responsibility schemes have become an integrated part of several waste management systems, in which producers are held fully or partially financially and/or physically responsible for the collection and treatment of post-consumer products. According to the Organization for Economic Co-operation and Development (OECD)[23], extended producer responsibility (EPR) shifted the financial and operating responsibilities and liabilities for post-consumer product management system from voluntary or helpful governmental programs to producers.

The OECD further identifies five main elements of an EPR system, namely:

i. shifting of the physical and financial responsibility for products and their associated post-consumer management,
ii. changing the behavior of producers who integrate needs for the collection and recycling of products in the product design stage,
iii. facilitating the creation of economic incentives for producers to promote "design for the environment,"
iv. harnessing market-driven forces to pursue environmental objectives, and
v. improving the effectiveness of both public and private sector contributions to the environment.

5.2. EPR Model and Organization

From the previous chapter, it can be concluded that EPR is implemented heterogeneously with diverse mechanisms, but always to achieve national goals. The core principle remains that manufacturers or importers pay a fee to dispose of their waste to the state or an authorized EPR operator.

EPR models and organizations that handle the implementation can vary from country to country[24]. EPR models can operate:

i. individually, where each manufacturer is responsible for their product category,
ii. or collectively, where manufacturers form Producer Responsibility Organizations (PROs) to handle waste on their behalf.

EPR organizations can vary in legal status, being:

i. non-profit,
ii. governmental or semi-governmental institutions,
iii. or commercial firms,
iv. and can be mixed of the above to tailor national circumstances.

[23] Organisation for Economic Co-operation and Development (OECD). (2001). Extended Producer Responsibility: A Guidance Manual for Governments. OECD Publishing. https://doi.org/10.1787/9789264189867-en

[24] OECD. (2016). Extended Producer Responsibility: Updated Guidance for Efficient Waste Management. Paris: OECD Publishing

5.3. EPR System

EPR mechanisms are widely adopted in various countries and industries to maximize waste recycling from goods that have reached the end of their useful life. EPR began as a public policy initiative in several European countries to address waste packaging materials and was later expanded to include various end-of-life products such as cars, tires, paper, chemicals, batteries, electronic devices, and pharmaceuticals. The different mechanisms for implementing EPR, with examples from the implementing countries, are listed in below table:

Table 6. Different EPR Systems with examples.

System	System Description	Example of Implementing country
Government (or state)	Producers and importers individually register with the relevant state body to comply with EEE waste management legislation	Japan's public EPR system is governed by laws such as the 1991 Law on the Promotion of the Use of Secondary Resources and the 2001 Fundamental Law on the Formation of a Society with a Sustainable Material Cycle. These laws enforce principles like "polluter pays" and "extended producer responsibility," mandating manufacturers to recycle and dispose of products responsibly. Specific laws for recycling household electrical appliances and old computers ensure proper collection and recycling processes are funded by consumers.
Collective	Producers and importers establish a fund to manage waste collectively through contracts with non-profit organizations or foundations	Sweden's El-Kretsen organization manages E-waste from collection to recycling, funded by Local Regional Authorities and producers. Switzerland also utilizes a collective EPR system with major PROs like El-Retur and RENAS, covering a significant market share and funded by manufacturers and government contributions
Individual	Producers independently manage waste collection and processing without paying fees	France's EPR system, as stipulated in the French Environmental Code, holds manufacturers responsible for end-of-life devices. Consumers pay an environmental fee for new EEE purchases, which covers recycling costs. Manufacturers can either manage waste individually or through state-approved eco-organizations, which require regular re-approval.
Mixed	A mixed system combines elements of individual, collective, and state EPR systems	South Korea's EPR law, enacted in 2003, allows producers to choose between building a recycling plant, contracting with a recycling company, or joining a PRO. The Ministry of Ecology sets recycling targets, ensuring compliance through flexible options for producers.

Effective EPR implementation requires addressing products with clear waste management benefits, including domestic producers and importers, establishing PROs, and ensuring financial contributions based on sales or imports. Government agencies must set and enforce collection and recycling targets, with penalties for non-compliance.

6. Preparation for EPR Implementation in Palestine for EEE and E-WASTE

6.1. Background

Currently, Palestine suffers from several issues critical for the robust management of electrical and electronic waste. In summary (but an exhaustive list was provided in the current situation report):

- There is no specific legislation for managing electrical and electronic waste (E-waste), but it is covered by hazardous waste regulation and assumed to be hazardous waste.
- There are no specifications for imported and manufactured goods regarding their environmental performance. Specifications are only available for refrigerators, and the proper description of the controlled/banned contents of hazardous materials is missing.
- Lack of public awareness of hazardous waste generally and E-waste specifically
- Fragmentation of responsibilities across various institutions and agencies that leads to poorly managing the waste stream. However, the regulations have solved this to the greatest extent.
- Informal sector for recycling with poor infrastructure for the collection and recycling with minimal health and safety considerations.
- Weak border control that leads to the smuggling of E-waste, among other metallic waste
- Data on waste quantity types and destinations is not fully available. Limited data is available only in a few reports and literature, which is only an estimate.
- There is insufficient data on the EEE in the harmonized system, where listing is limited to countries of imports and exports, in addition to the total cost of 1000 US$ per item. There are no quantities, specifications, or contents. Inter-trade with the Israeli market is complex, where goods may enter the West Bank for commercial or personal uses without proper invoices or registration in the HS system. The same can be done for personal goods bought from other countries and brought through the birders that are under Israeli control.

The bright side to the above is that Palestine now has well-established institutions with qualified staff who have acquired experience from local practices and exposure to international experience. contradictions in the laws were mostly solved in the regulations (bylaws) by assigning clear roles and responsibilities to line ministries and institutions (as discussed in the current situation report on licensing of industries). Based on all of the above, the current section is setting a roadmap for implementing the EPR for E-waste in Palestine, not only as an environmental policy that comes with economic and social benefits but also as a means to solve all the obstacles that face the sector.

The roadmap will proceed backward with the identified obstacles above to achieve the required aspects of the regulation, starting with the preparation steps.

6.2. EEE Data

The adoption of the HS in 2015 came as a tool with many environmental benefits, as it allows for the quantification of imported and exported goods. This makes a link with controlled or banned substances possible, in addition to providing a database for estimation and prediction of waste quantities.

Needed Actions and Justification:

- Provide EQA access to the HS system to keep records of goods that will eventually become a waste.
- To add more details to the HS system, such as quantities of goods and, if possible, the weight in order to facilitate the estimation methods of E-waste generation
- To add contents of major materials and other substances of concern to facilitate monitoring and control of controlled and banned substances (once the list is approved), also to be linked with implementation of Basel, Rotterdam, Stockholm, Minamata, and Vienna conventions and Montreal Protocol.

Timeframe: 2025

6.3. E-waste Data

E-waste proper quantification is only possible in a well-controlled system, where all waste ends in a separate stream. Most countries depend on estimation techniques and utilize the linkage between the HS systems and their own classification system. In this regard, the Palestinian key (PWEEE) for E-waste was introduced. Also, three estimation methods were used to estimate the waste quantities and the last one of them was used for future prediction, these are:

- Sales method
- Weibull (late) distribution method
- GDP per capita method

In the current situation report, the sales method was recommended for the early years after 2015 (the adoption of the HS system) and for shifting to the Weibull distribution method after 2025. The GDP method is to be used for predicting future quantities.

Needed Actions and Justification:

- To develop a toolkit for calculating the quantities of E-waste based on the HS system. The toolkit will produce reports of the quantities for each PWEEE key, similar to the exercise done to prepare the current situation report.
- The toolkit to be developed further to estimate hazardous materials in use or wasted to alert proper handling and end-of-life procedures
- Train EQA and PCBS staff on the toolkit, exporting data, and reporting.

Timeframe: 2025-2026

6.4. Sector Formalization, Border Control and Waste Smuggling

Under the current political situation, extending border control out of area A of the West Bank seems impossible. Major smuggling activities and the destination of smuggled goods and waste predominantly occur in Area C. In this area, Palestinian control through customs and environmental police is limited or non-existent.

Specific to the E-waste, the Palestinian Authority can use the economic tools to support their legal means. As reported earlier that 70,000-80,000 tons of E-waste is recycled annually in South Hebron, where 35% are vehicle motors and 10-20% from the West Bank. This means that around 35,000 tons of waste are smuggled annually. E-waste generation due to consumption of new and used equipment is 35,000-40,000 tons/year, where less than 15,000 tons is recycled, mainly in South Hebron. This means that local E-waste production if properly handled through the implementation of EPR, can replace smuggled waste.

Also, it is worth mentioning that the Israeli government adopted the EPR for E-waste, meaning they collect advanced fees from producers and importers for proper handling and treatment of waste. The practice is to deliver this waste to the Palestinian market through smuggling without proper treatment by the Israeli recyclers. Later, the Israeli market takes back the recycled metals tax-free.

Formalizing the sector through proper registration of traders, recyclers, and waste collectors can benefit all. This will lead to the application of health and safety measures, reducing the prevalence rate of diseases and injuries among the workers and surrounding communities and environmental pollution. In addition, once a full EPR scheme is implemented with incentives from the government and subsidies from the producers and importers, there will be economic benefits.

Needed Actions and Justifications for Formalization of the Sector:

- To implement EPR system
- To start a registration and licensing process for waste collectors and recyclers by relevant authorities: the Ministry of National Economy for companies, the Ministry of Industry for industrial facilities, the Ministry of Health, and the Ministry of Local Government, and Civil Defense for the satisfaction of licensing requirements on health, safety, and location.
- To start a special funding means for recyclers, to start with the Palestinian Investment Fund. Later, the producers and importers, through the EPR-PRO, provided E-waste free of tipping fees.
- Ministry of Labor to assure safe operations through training, site visits, and documentation.
- EQA and Environmental Police to monitor and start legal cases for waste and E-waste burners.

Needed Actions and Justifications for Waste Smuggling:

- There is a need to convince recyclers to stop the use of smuggled waste through the economic means introduced above. The Ministry of Local Government, through the municipalities and community leaders, can start this process.
- Strengthening of legal entities such as An-Naqaa, Eco-Tech, and As-Safa facilities and encouraging others to group in a representing organization or to join An-Naqaa. A similar organization must be established in the North of the West Bank, as such activities started in Qalqilia.
- To prepare a case and be reported for the Basel Convention, providing that most of the smuggled waste is considered hazardous based on the convention, asking for stopping illegal trade from the Israeli side.

- Law enforcement through the Customs Police and Environment Police and the legal authorities.

Timeframe: 2026-2027

6.5. EEE Specifications

The implementation of specifications for Electrical and Electronic Equipment (EEE) is critical to ensure environmental performance and safety from the moment these products enter the market. The lack of specifications for most EEE, except refrigerators, contributes to improper waste management and potential environmental hazards.

Needed Actions and Justifications:

- Establish environmental performance standards for all categories of EEE, detailing controlled and banned substances. PSI, EQA, and Ministry of Industry
- Collaborate with international bodies to adopt or adapt global standards to the Palestinian context.
- Ensure specifications cover the entire lifecycle of EEE, from production to disposal.
- Enhance the HS system to include detailed specifications for EEE, ensuring all imported goods meet established standards.
- Facilitate tracking and monitoring of EEE to ensure compliance with environmental regulations.
- Train customs and regulatory authorities on the new specifications and the importance of compliance.
- Provide resources and training for manufacturers and importers to meet the new specifications.

Timeframe: 2025-2026

6.6. Public Awareness

Public awareness is a cornerstone for the successful implementation of EPR for E-waste. The general lack of awareness about hazardous waste and E-waste management significantly hinders effective waste management practices.

Needed Actions and Justifications:

- EQA need to launch campaigns to educate the public about the hazards of E-waste and the importance of proper disposal.
- Utilize multiple platforms, including social media, television, and community workshops, to reach a broad audience.
- Partner with universities and research institutions to conduct studies and disseminate information on E-waste impacts.

Timeframe: 2025-2027

7. Proposed EPR Scheme

The chapter discusses the necessary steps to implement the EPR in Palestine for the sector of EEE and its waste.

7.1. EPR Model

Under an economy of scale and due to the relatively small market in Palestine, which heavily depends on importing and limited production, the individual model will not be feasible.

Adopting the collective approach, through establishing a Producer Responsibility Organization (PRO) for E-waste will be more efficient and effective. All producers and importers will be asked to register officially in the PRO after introducing the idea and meeting the requirements supported by the law. This centralized approach can streamline the collection, treatment, and recycling processes, reduce administrative and operational costs, and ensure compliance with environmental regulations. A PRO can also facilitate collaboration among stakeholders, enhance public awareness and participation in E-waste management, and ultimately contribute to a more sustainable and environmentally responsible system in Palestine.

7.2. EPR Mechanism

The best option for setting the EPR mechanism is to use a mixed approach, namely, the governmental and collective approach, and as a non-profit managed by PRO. The mixed PRO approach will enhance the public-private partnership, facilitate information sharing, and, most importantly, ensure access to funding. This collaborative structure will leverage the strengths and resources of both public and private sectors, fostering a more integrated and comprehensive E-waste management system. Additionally, it will encourage stakeholder engagement, improve regulatory compliance, and provide a sustainable financial model to support E-waste initiatives in Palestine.

Establishing a PRO will significantly reduce the environmental impact of E-waste in Palestine by ensuring proper disposal and recycling of hazardous materials. Also, can create new business opportunities in the recycling and waste management sectors, contributing to job creation and economic growth. Thus, the PRO will require overcoming several challenges, including building the necessary infrastructure, educating stakeholders, and ensuring robust regulatory enforcement.

PRO for E-waste is to be established, and headed by EQA, with representatives from:

- The government represented by customs, the Ministry of Local Government, the Ministry of Telecommunication and Digital Economy, and the Ministry of National Economy
- Palestinian Investment Fund
- Federation of Palestinian Chambers of Commerce Industry and Agriculture
- Federation of Palestinian Industries
- Representatives of Producers and Importers

7.2.1. PRO Duties

The PRO will be mandated with:

1. Registration and Monitoring: Registering producers and importers and monitoring their compliance with E-waste management obligations.
2. Infrastructure for collection and transportation: Plan and execute a collection strategy for E-waste, through contractors from public institutes and collection centers, producers or importers tack-back strategy and centers.
3. Collection Coordination: Coordinating the collection of E-waste from various points, including businesses, retailers, and municipal collection sites.
4. Treatment and Recycling: Ensuring that collected E-waste is treated and recycled in an environmentally sound manner, in compliance with national and international standards.
5. Ensuring Treatment and Recycling: Guaranteeing the treatment and recycling of collected electrical and electronic waste in an environmentally sound manner, in accordance with national and international standards.
6. Financial Management: Managing financial contributions from producers to fund the E-waste management system, including setting up and maintaining financial guarantees.
7. Data Management: Providing a comprehensive database for the sector, including collection and recycling facilities, waste quantities throughout all stages, as well as recovered material data and commercial details.

Regarding recycling facilities and the entire supply chain, from collection, transportation, sorting, recycling, recovery, and sale of metals and plastics, it is preferable to follow an open-market system with company and facility registration in accordance with Palestinian law. This does not preclude some activities from being managed by governmental entities or the PRO, though this is not preferred to avoid conflicts of interest and the loss of competitive advantages.

7.2.2. Obligations for producers and importers

Producers and Importer need to:

- Register their products in the PRO system and database
- Entering into a binding agreement with the PRO
- Periodically declaring the quantities of products placed on the market to calculate the applicable fees
- Paying the fees to the PRO covering all the costs related to waste management.
- Complying with obligations related to the products specifications (to be set by the PSI) that consider eco-design principles to reduce its environmental impact and the production of waste.
- Appointing an authorized representative for major imported products. The Authorized Representative (AR) is an intermediary between foreign producer's and the Palestinian Authority represented by the PRO for the compliance of EPR obligations and to guarantee efficient communication.

7.2.3. B2B vs B2C

In many countries, mainly in the EU, The PROs' responsibility may also depend on the type of waste producer. Often times, a relevant distinction needs to be made between household waste (or B2C) and between commercial and industrial waste (or B2B). Providing the B2B waste are easier

to monitor and control than those of B2C, in addition that governmental E-waste are currently managed by ministry of finance. The PRO can be mandated with management of both wastes as follows:

For B2B:

Collection and Financing	Producers through AR are responsible for the collection and financing of B2B E-waste. This includes providing collection services or partnering with licensed waste management companies to ensure proper disposal
Waste Management Plan	Producers and importers must submit a comprehensive waste management plan to the Environmental Quality Authority (EQA) through the PRO, detailing the processes for collection, treatment, and recycling of B2B E-waste. This plan should be updated every year
Product Marking	All B2B products must be clearly marked to identify the producer, ensuring traceability and accountability in the waste management process
Financial Guarantees	To ensure the sustainability of the waste management system, producers may be required to provide financial guarantees. This could involve setting up a blocked bank account or obtaining recycling insurance to cover future waste management costs
Reporting and Compliance	Producers and importers must report annually to the EQA through the PRO on the quantities of B2B products put on the market and the corresponding volumes of E-WASTE collected and treated. This data will help monitor compliance and effectiveness of the waste management strategies

For B2C:

Collection and Financing	Producers through the AR are obligated to finance the collection, treatment, recycling, and disposal of B2C E-waste. This involves setting up or participating in collection schemes that facilitate the return of end-of-life products from consumers
Product labelling	All B2C products must be properly labeled (in the EU the label is a crossed-out wheeled bin symbol), indicating that these products should not be disposed of as unsorted municipal waste. This labeling will raise consumer awareness and encourage proper disposal

Information Sharing	Retailers must provide consumers with clear information on the available return and collection systems, the importance of separating E-waste from regular waste, and the environmental and health impacts of improper disposal
Reporting and Compliance	Producers and importers must report annually on the quantities of B2C products placed on the market. This reporting will help the EQA and the PRO track compliance and the overall effectiveness of the E-WASTE management system

7.3. EPR Fees

To successfully implement an Extended Producer Responsibility (EPR) system for electrical and electronic waste in Palestine, developing a robust and equitable fee structure is essential. This system must consider Palestine's unique economic and market conditions, ensuring effective participation from producers and importers in managing electrical and electronic waste, while maintaining economic feasibility.

Overview:
The fee payment system for EPR in Palestine will be based on the following principles:

1. Proportionality: Fees will be proportional to the quantity and type of electrical and electronic equipment each producer or importer puts on the market.
2. Transparency: The fee structure and payment processes will be transparent to all stakeholders, ensuring trust and compliance.
3. Simplicity: The system will be simple to administer and comply with, reducing administrative burdens for businesses and the government.

The fee system will include three categories:

1. Category One: PRO registration fees, which will be nominal as the Board of Directors decides.
2. Category Two: Collection and recycling fees, paid by manufacturers and producers if they opt for PRO to handle these responsibilities, as detailed later.
3. Category Three: Guarantee fees, paid by manufacturers and producers if they manage collection and recycling themselves. These fees are partially refundable after the PRO covers operational costs, ensuring effective collection and recycling processes.

7.3.1. Fee Structure

The fee structure will be tiered, reflecting the environmental impact of different types of EEE. Categories will be based on the size, weight, and potential environmental harm of the products. For instance:

1. Small Appliances: This includes items such as mobile phones, tablets, and small kitchen appliances. Due to their smaller size and generally lower environmental impact, these will have a lower fee.

2. Large Appliances: This includes refrigerators, washing machines, and televisions. Due to their size, weight, and more complex recycling processes, these will incur higher fees.
3. Hazardous Components: Items containing hazardous substances, such as batteries and certain types of lighting, will have additional fees to account for the special handling required.

7.3.2. Fee Calculation

Fees will be calculated based on the weight of the products placed on the market, with a set rate per kilogram for each category. This ensures that larger and heavier products, which typically have a greater environmental impact, contribute more to the EPR system. For example:

- Small Appliances: $0.50 per kilogram
- Large Appliances: $1.00 per kilogram
- Hazardous Components: $1.50 per kilogram

7.3.3. Payment Process

1. Registration: All producers and importers of EEE must register with the Producer Responsibility Organization (PRO). During registration, they will provide details about the types and quantities of products they place on the market.
2. Reporting: Registered producers and importers will report to the PRO the quantities of EEE sold in the market quarterly. This report will include the weight and category of each type of product.
3. Invoice Generation: The PRO will generate an invoice detailing the total EPR fees due based on the reported quantities. The invoice will include a breakdown of fees by product category and the total amount payable.
4. Payment: Producers and importers will have 30 days to pay the invoiced amount. Payments can be made through bank transfer, online payment platforms, or other methods approved by the PRO.
5. Verification and Audits: To ensure compliance, the PRO will conduct random audits of producers and importers. These audits will verify the accuracy of reported quantities and ensure that the correct fees have been paid.

7.3.4. Fund Management

The fees collected will be managed by the PRO and used exclusively for E-waste management activities. This includes:

- Collection and transportation of E-waste.
- Operation and maintenance of recycling facilities.
- Public awareness campaigns.
- Research and development of more efficient recycling technologies.

7.3.5. Incentives and Penalties

To encourage compliance and early adoption, the following incentives and penalties will be implemented:

- Incentives: Early bird discounts for timely payments, tax deductions for E-waste management investments, and public recognition for compliant businesses.
- Penalties: Fines for late payments, higher fees for non-compliance, and potential legal action for persistent defaulters.

7.4. Staged Implementation and Objectives for Recycle

Due to the preparation steps for EPR implementation (chapter 6), the implantation of EPR by staged approach can proceed simultaneously with the preparation steps. This means prioritizing the targeted E-waste groups, providing that experience is already built for dismantling refrigerators, freezers, air conditioners, computers, screens, cables, and batteries, in addition to recovering their basic components (metals, plastics, gases, and foams), these should be prioritized. Lamps are produced in minimal quantities. Also, there is no experience in the recovery of mercury from mercury-containing lamps, so such recovery can be delayed. In addition, telecommunication equipment requires prior approval from the Ministry of Telecommunication and Digital Economy so that equipment importers can be registered in the EPR system, and the waste of such equipment can be easily tracked. To ensure the success of the EPR system, it is essential to set clear objectives for waste collection and recycling. Below is a suggested staged approach for the targeted E-waste groups (Table 7).

Additionally, the performance of the Extended Producer Responsibility (EPR) system can be evaluated using environmental, economic, and technical Key Performance Indicators (KPIs), which can be reported by the Producer Responsibility Organization (PRO), such as:

Table 7. Collection and Recycle Rates objectives for E-waste.

Palestinian Key	Category (Group)	Recycle %					
		2026	2030	2035	2040	2045	2050
PWEEE1	Heat Exchange Devices	20%	50%	60%	70%	80%	>80%
PWEEE2	Screens and Devices with Screens	40%		60%	70%	80%	>80%
PWEEE3	Lamps	0%	50%	60%	70%	80%	>80%
PWEEE4	Large Appliances	50%	60%	70%	80%	>90%	>85%
PWEEE5	Small Appliances	20%	50%	60%	70%	80%	>80%
PWEEE6	Information and Communication Technology Devices	50%	60%	70%	80%	>90%	>85%

In addition the performance of implementing the EPR can be assessed using environmental, economic, and technical key performance indicators (KPIs)[25], that can reported be the PRO, such as:

- Collection Rates: The percentage of waste collected relative to the total amount of product placed on the market (POM).

[25] Ahlers, J., Hemkhaus, M., Hibler, S., & Hannak, J. (2021). Analysis of Extended Producer Responsibility Schemes: Assessing the performance of selected schemes in European and EU countries with a focus on WEEE, waste packaging and waste batteries. Berlin: adelphi consult GmbH

- Recycling and Recovery Rates: The proportion of collected waste that is effectively recycled or recovered.
- Cost Efficiency: The costs incurred by producers and PROs for waste management, including collection, transport, and recycling.
- Stakeholder Satisfaction: The satisfaction levels among producers, and public authorities regarding service delivery and cost-effectiveness.
- Innovation: The ability of EPR scheme to drive eco-design and innovation in recycling technologies
- Awareness: The ability of EPR scheme to raise consumer awareness.

7.5. Institutional Set-up

The current study report discussed the institutional aspects of supply, value, and waste chains. Needed actions for a transitional economy were also suggested. To cover the EPR aspects from the institutional point of view, the discussion is extended here (Table 8), with keeping in mind that the PRO will act as a coordination body among different stakeholders.

Table 8. Institutional Framework Matrix for EPR in Palestine.

Stakeholder	Roles	Responsibilities	Needs for EPR Implementation
EQA	Lead agency for policy and enforcement, Monitoring, EIA approval, public awareness, and reporting locally and to the conventions in concern	• Develop and update E-waste policies and regulations • Monitor and enforce compliance • Conduct public awareness campaigns	• Enhanced legal authority • Capacity building for staff Financial resources for programs • Public awareness materials
Ministry of Finance (MoF)	Financial oversight and incentives, customs management, and tax exemption, supply and disposal of EEE and their waste for the public institute.	• Allocate financial resources • Provide tax incentives • Manage EPR funds	• Budget allocations • Training on EPR financial mechanisms • Efficient fund management systems
Ministry of National Economy (MoNE)	Market regulation	• Register EEE manufacturers and importers	• Database of registered producers

Stakeholder	Roles	Responsibilities	Needs for EPR Implementation
		• Enforce EPR compliance • Promote eco-design	• Training on market regulation enforcement • Incentives for sustainable production
Ministry of Industry	Industrial regulation and support	• Promote sustainable industrial practices • Ensure compliance with EPR in manufacturing	• Guidelines for sustainable manufacturing • Training for industrial compliance • Support for ecofriendly initiatives
Ministry of Telecommunication and Digital Economy	Regulation of electronic communications	• Ensure EPR compliance in the telecom sector • Promote recycling of telecom equipment	• Coordination with telecom companies • Training on EPR for telecom sector • Public awareness campaigns
Palestinian Central Bureau of Statistics (PCBS)	Data collection and analysis	• Collect and analyze data on E-waste • Provide statistical reports to support policymaking	• Access to data collection tools • Training on E-waste data analysis • Collaboration with other stakeholders
Ministry of Labor	Workforce regulation and safety	• Ensure safe working conditions in E-waste handling • Provide training for workers in the E-waste sector	• Safety guidelines • Training programs for workers • Monitoring and enforcement mechanisms
Ministry of Transport	Transportation and logistics	• Regulate transport of E-waste	• Guidelines for safe transport

Stakeholder	Roles	Responsibilities	Needs for EPR Implementation
		• Ensure safe and efficient logistics for E-waste management	• Coordination with transport companies • Training for transport regulations
Palestinian Standards Institution (PSI)	Standardization and quality control	• Develop and enforce standards for EEE and E-WASTE • Ensure products meet safety and environmental standards	• Development of EPR standards • Training for compliance • Collaboration with industry and regulators
Municipal Development and Lending Fund (MDLF)	Financial and technical support to municipalities	• Provide funding and technical support for local E-waste initiatives	• Financial resources • Technical expertise • Training for municipal staff
Palestine Investment Fund (PIF)	Investment in sustainable initiatives	• Invest in projects for E-waste recycling and management	• Investment guidelines • Identification of viable projects • Financial and technical support
Ministry of Health	Public health and safety	• Monitor health impacts of E-waste • Provide guidelines for safe handling and disposal	• Health impact studies • Training for health and safety • Public health campaigns
Civil Defense	Emergency response and safety	• Respond to emergencies related to E-waste incidents • Ensure safety measures are in place	• Emergency response training • Safety equipment • Coordination with other emergency services

Stakeholder	Roles	Responsibilities	Needs for EPR Implementation
Environmental Police	Environmental law enforcement	• Monitor EEE compliance • Enforce environmental regulations	• Training on E-waste regulations • Equipment for monitoring and enforcement • Coordination with EQA
Customs Police	Border control and inspection	• Inspect imported EEE for compliance • Prevent illegal E-waste trade	• Training on EPR regulations • Inspection tools and technologies • Collaboration with EQA and MoNE
Local Government Units (LGUs)	Local implementation and management	• Set up and manage collection points • Ensure proper segregation and transport of E-waste	• Infrastructure for collection and recycling • Training for local officials • Public awareness programs
Producers and Importers	Primary responsibility for E-waste	• Develop takeback and recycling schemes • Finance collection, recycling, and disposal	• Guidelines on EPR compliance • Support for developing recycling programs • Financial incentives
Recycling Companies	E-waste processing and recycling	• Ensure environmentally sound recycling • Report processed quantities	• Access to modern recycling technologies • Training on best practices • Financial support for operations

Stakeholder	Roles	Responsibilities	Needs for EPR Implementation
NonGovernmental Organizations (NGOs)	Advocacy and awareness	• Conduct education and outreach • Monitor EPR implementation	• Funding for awareness campaigns • Training on E-waste issues • Collaboration with government and producers
Public	Participation and compliance	• Dispose of E-waste properly • Participate in awareness programs	• Access to information on disposal methods • Convenient collection points • Education on E-waste impacts
Academia	Research and development	• Conduct research on E-waste management • Develop innovative recycling technologies	• Funding for research • Collaboration with industry and government • Access to data and resources
Retailers	Collection and takeback	• Provide collection points for E-waste • Educate consumers on proper disposal	• Training on EPR roles • Financial incentives for participation • Public awareness materials

7.6. Legal framework

Finally, the roadmap should base on legislation to be implementable. A new legislation as regulation for E-waste management in Palestine is recommended to be a comprehensive mandate to address the environmental and public health challenges posed by electrical and electronic waste. The regulation as introduced in the current situation report can be extended to cover the Extended Producer Responsibility (EPR) requirements, with mandates for producers and importers of electrical and electronic equipment (EEE) to bear the financial and operational responsibility for

the end-of-life management of their products. The proposed structure of the new regulation was intended to enhance sustainability, promote recycling, ensure the safe disposal of E-waste hazardous materials, and improve EEE's environmental performance.

Appendices

Appendix 1 : Internal Bylaw for the PRO

Article 1: Purpose and Scope
1.1 The purpose of this bylaw is to establish the operational framework and governance structure for the Producer Responsibility Organization (PRO) for E-waste in Palestine.
1.2 This bylaw outlines the roles, responsibilities, and procedures for implementing Extended Producer Responsibility (EPR) for E-waste, ensuring compliance with environmental regulations, and promoting sustainable waste management practices.

Article 2: Establishment of the PRO
2.1 The PRO for E-waste shall be established as a mixed entity comprising representatives from the following sectors:

- Government: Environmental Quality Authority (EQA), Customs, Ministry of Local Government, Ministry of Telecommunication and Digital Economy, Ministry of National Economy.
- Palestinian Investment Fund.
- Federation of Palestinian Chambers of Commerce Industry and Agriculture.
- Federation of Palestinian Industries.
- Representatives of Producers and Importers.

2.2 The PRO shall operate as a non-profit organization dedicated to the effective management of E-waste in Palestine.

Article 3: Governance Structure
3.1 The governance of the PRO shall be vested in a Board of Directors, which shall consist of representatives from the sectors listed in Article 2.1.
3.2 The Board of Directors shall elect a Chairperson, a Vice-Chairperson, and a Secretary from among its members.
3.3 The Board of Directors shall meet at least quarterly to review progress, make strategic decisions, and ensure compliance with the bylaw.

Article 4: Roles and Responsibilities
4.1 The PRO shall be responsible for:

- Developing and implementing an E-waste management plan in line with national regulations.
- Coordinating with stakeholders to ensure the effective collection, treatment, and recycling of E-waste.
- Promoting public awareness and participation in E-waste management.
- Securing and managing funds for E-waste management activities.
- Reporting on the performance and impact of E-waste management initiatives.

4.2 Government representatives shall provide regulatory oversight, facilitate policy development, and ensure alignment with national environmental goals.
4.3 Private sector representatives shall contribute industry expertise, facilitate the collection and recycling of E-waste, and support financial sustainability.

Article 5: Funding and Financial Management

5.1 The PRO shall secure funding through:

- Contributions from member organizations.
- Grants and donations from national and international entities.
- Fees collected from producers and importers based on the quantity of EEE placed on the market.

5.2 The PRO shall establish a transparent financial management system to ensure accountability and proper use of funds.

5.3 An annual financial report shall be prepared and made available to all stakeholders.

Article 6: Implementation of EPR

6.1 Producers and importers of electrical and electronic equipment (EEE) shall be required to take responsibility for the end-of-life management of their products.

6.2 The PRO shall develop a detailed EPR implementation plan, including:

- Registration and reporting requirements for producers and importers.
- Collection and recycling targets.
- Procedures for the safe and environmentally sound treatment of E-waste.
- Incentives and penalties to encourage compliance.

6.3 The PRO shall establish partnerships with certified E-waste recycling facilities to ensure proper disposal and recycling.

Article 7: Monitoring and Evaluation

7.1 The PRO shall establish a monitoring and evaluation framework to assess the effectiveness of E-waste management activities.

7.2 Regular audits and assessments shall be conducted to ensure compliance with the bylaw and identify areas for improvement.

7.3 The PRO shall publish an annual report detailing progress, challenges, and future plans.

Article 8: Amendment and Review

8.1 This bylaw may be amended by a two-thirds majority vote of the Board of Directors.

8.2 The bylaw shall be reviewed every three years to ensure its continued relevance and effectiveness.

Article 9: Dissolution

9.1 In the event of dissolution, the assets of the PRO shall be distributed to organizations with similar objectives, as determined by the Board of Directors.

9.2 The dissolution process shall be conducted in accordance with applicable laws and regulations.

Article 10: Miscellaneous Provisions

10.1 The PRO shall operate in accordance with Palestinian laws and regulations and adhere to international best practices for managing E-waste.

10.2 Any disputes arising from implementing this bylaw shall be resolved through mediation or arbitration, as agreed upon by the parties involved.

This bylaw is hereby adopted by the Board of Directors of the PRO for E-waste on [Date], and shall take effect immediately.

Appendix 2 : Key Articles for E-waste Legislation with Inclusion of the EPR Requirements

Key articles of the proposed regulation for E-waste that covers the EPR initiation and implementation.

- Article 1 - Definitions: Defines key terms such as E-waste, producer, EPR, EEE, and the Producer Responsibility Organization (PRO).
- Article 2 - Extended Producer Responsibility (EPR): Mandates that producers and importers design products for easy recycling and reduce waste. They are responsible for the costs associated with collecting, treating, and recycling E-waste.
- Article 3 - Licensing and Regulation: Requires all entities involved in the collection and treatment of E-waste to obtain licenses and comply with national and international environmental standards.
- Article 4 - Disposal and Recycling: Prohibits the burning or landfilling of E-waste without prior treatment and encourages recycling through incentives for companies adopting environmentally friendly recycling practices.
- Article 5 - Inspection and Control: Enforces regular inspections by environmental authorities to ensure compliance with E-waste management regulations and imposes penalties for violations.
- Article 6 - Public Awareness and Education: Implements educational programs targeting schools, universities, and the general public to raise awareness about the importance of recycling and safe disposal of E-waste.
- Article 7 - Collection and Sorting: Establishes dedicated collection points for E-waste and promotes advanced sorting techniques to facilitate recycling.
- Article 8 - International Cooperation and Technological Updates: Encourages international cooperation to exchange expertise and best practices in E-waste management and regularly updates legislation to reflect technological advancements.
- Article 9 - Partnerships with the Private Sector: Promotes partnerships with private companies to develop innovative recycling technologies and reduce E-waste generation, offering incentives for investment in sustainable practices.
- Article 10 - Monitoring and Evaluation: Requires periodic assessments of E-waste management facilities and processes, with fines imposed on non-compliant entities.
- Article 11 - Compliance with the Basel Convention: Ensures that all entities handling E-waste are registered under a national system compliant with the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal.
- Article 12 - International Transport Procedures: Mandates that all cross-border E-waste shipments comply with international standards for packaging, labeling, and transport, with penalties for illegal trafficking.
- Article 13 - Management of Imported and Exported E-waste: Requires regular reporting on the volumes and types of E-waste imported and exported, ensuring transparency and adherence to international agreements.
- Article 14 - Training and Capacity Building: Organizes training programs for individuals and companies in the E-waste management sector to enhance understanding and compliance with environmental regulations.
- Article 15 - Institutional Coordination: Creates a coordination body within the PRO to ensure effective collaboration among various stakeholders involved in E-waste management.

- Article 16 - EPR Fees: Introduces a fair fee system where producers and importers pay fees proportional to the quantity and type of EEE placed on the market, supporting the funding of E-waste management activities.
- Article 17 - Implementation Phases and Recycling Targets: Sets phased implementation targets for recycling different categories of E-waste, with specific collection and recycling rates to be achieved over time.
- Article 18 - Obligations for Producers and Importers: Requires producers and importers to register with the PRO, report the quantities of EEE placed on the market, and comply with product design standards to minimize environmental impact.
- Article 19 - Management of Commercial and Industrial E-waste (B2B): Details the responsibilities of producers for the collection and recycling of commercial and industrial E-waste, including financial guarantees and reporting obligations.
- Article 20 - Management of Household E-waste (B2C): Outlines the responsibilities of producers for the collection and recycling of household E-waste, including labeling requirements and consumer information.
- Article 21 - Institutional Framework: Defines the roles and responsibilities of various governmental and non-governmental stakeholders in the E-waste management system, ensuring effective coordination and implementation.
- Article 22 - E-waste Classification: Establishes a detailed classification system for E-waste, covering all types of electrical and electronic equipment and their components. The classification includes criteria such as the type of device, its use, hazardous material content, and recycling potential.
- Article 23 - Development of New Standards for EEE: Mandates the development and enforcement of new standards for the environmental performance of EEE. These standards will cover aspects such as energy efficiency, use of recyclable materials, and reduction of hazardous substances.