Appendix to the Order of Kazakhtelecom
JSC No. 248 dated 29.10.2025

ҚАЗАҚТЕЛЕКОМ

Production and Consumption Waste Management Program of Kazakhtelecom JSC for 2025-2032

Astana, 2025

Content

1. Introduction

1. Modern telecommunications companies operating in the context of global digitalization are facing increasing environmental challenges related to the intensive use of equipment, its obsolescence and an increase in the amount of waste of various morphological composition.
2. In accordance with the Environmental Code of the Republic of Kazakhstan (2021), as well as international environmental management standards (ISO 14001:2015, GRI 306 Waste, SASB), the formation of a systematic approach to waste management is of particular importance.
3. Kazakhtelecom JSC (hereinafter referred to as the Company), being the largest national telecom operator, recognizes its strategic responsibility in the field of sustainable development and waste lifecycle management. The waste management Program of Kazakhtelecom JSC (hereinafter referred to as the Program) reflects a set of measures aimed at reducing the environmental burden, minimizing risks to public health and ensuring integration into global ESG practices.
4. Scientific justification of the relevance of the Program:
   1) telecommunications industry is characterized by a high proportion of hazardous waste (electronic and electrical equipment, batteries, mercury-containing lamps, and oils), which poses additional risks to ecosystems;
   2) in the structure of the Company's waste generation, there is a tendency for the growth of electronic waste (e-waste), which require a special approach to recycling and disposal;
   3) transition to a circular economy in the context of the ESG strategy involves the involvement of secondary resources in economic turnover, the reduction of waste disposal and the formation of a Zero Waste system.
5. Thus, the Program is considered as part of the Environmental Policy, ESG Strategy of Kazakhtelecom JSC for 2024-2032 and a tool for achieving Sustainable Development Goals. United Nations Development Group (SDG 12 “Responsible consumption and production”, SDG 13 “Combating climate change”).

2. Waste management principles and requirements

6. The program is formed in accordance with the Environmental Policy of Kazakhtelecom JSC, the ESG strategy of Kazakhtelecom JSC for 2024-2032 and is based on the principles of scientific rationality, preventativeness and circular economy.
7. Key principles of the Program:
   1) Compliance with the regulatory framework. Waste management is carried out in strict accordance with the Environmental Code of the Republic of Kazakhstan, sanitary standards, as well as international standards ISO 14001:2015.

2) Hierarchy of waste management. The principle of priority applies: prevention of waste generation → reuse → recycling → disposal → neutralization → burial (as a last resort).
3) ESG integration. Waste management is an integral part of the corporate ESG agenda and forms the environmental component of non-financial reporting.
4) Transparency and accountability. The results are disclosed in corporate reports on GRI 306 standards and in integrated ESG reporting.
5) Reducing the carbon footprint. By increasing the share of recycled waste, Company contributes to the decarbonization of the economy and the reduction of indirect greenhouse gas emissions (Scope 3).
6) Social engagement. The Company's employees are actively involved in separate waste collection programs, internal educational projects, and environmental campaigns.

8. Obligations of the Company:
1) by 2032, achieve a waste recycling level of at least 80%;
2) completely eliminate the disposal of mercury-containing waste, batteries and batteries;
3) to implement a digital waste monitoring system in all branches by 2027;
4) annually confirm the compliance of the waste management system with the requirements of ISO 14001.
9. Program is based on the concept of waste lifecycle management, which involves not only waste generation control, but also systematic planning of their re-involvement in circulation, which corresponds to the principles of circular economy.

3. Concept of waste, its identification and classification.
3.1. Theoretical and methodological foundations

10. Waste means any substances, materials or objects formed during production, performance of works, provision of services or in the process of consumption (including goods that have lost their consumer properties), which their owner explicitly recognizes as waste or must send for disposal or restoration by virtue of the requirements of the law or intends to expose or expose operations for deletion or restoration.
11. Waste does not include:
1) substances released into the atmosphere as part of exhaust gases (dust and gas-air mixture);
2) waste water;
3) polluted lands in their natural occurrence, including the untreated contaminated soil layer;
4) real estate objects that are firmly connected to the land;
5) removed uncontaminated soils;
6) widespread solid minerals that have been extracted from their natural occurrence during excavation during construction activities and which, in accordance with the project document, are being used or will be used in their natural state for construction purposes on the territory of the same construction site where they were separated.;

7) firearms, ammunition and explosives subject to disposal in accordance with the legislation of the Republic of Kazakhstan in the field of state control over the turnover of certain types of weapons.

12. Waste identification is the first and key step of a waste management system. It is a systematic process of identifying their morphological composition, physico-chemical characteristics and potential environmental hazards and the procedure for further handling (collection, storage, transportation, disposal or burial).
13. The step-by-step process begins with:
    1) Identification of sources of waste generation. Analysis of technological processes, equipment, and used raw materials. Determining at what stage and to what extent waste is generated.
    2) Description and fixation of the waste composition. Description of external characteristics (solid, liquid, gaseous). Determination of chemical and physical composition (presence of toxic, combustible, radioactive or biological components).
    3) Classification as a type of waste. Classification according to the Environmental Code of the Republic of Kazakhstan (Articles 286, 287, 338). Manufacturing, consumer, medical, radioactive, and others. Dangerous, non-dangerous, inert.
    4) Definition of the hazard class. Laboratory tests (if necessary). Classification to hazard class 1-5 (according to the degree of negative impact) (Sanitary and epidemiological requirements for the collection, use, application, neutralization, transportation, storage and disposal of industrial and consumer waste, approved by Order of the Acting Minister of Health of the Republic of Kazakhstan dated December 25, 2020 No.KR DSM-331/2020).
    5) Assignment of a code from the Waste Classifier. Waste coding in accordance with the official classifier approved by the authorized body (Article 338 of the Environmental Code of the Republic of Kazakhstan).
    6) Documentation. Registration of a waste passport (mandatory for hazardous waste). Adding waste records to the waste register. Indication of the method of handling (disposal, recycling, burial).
14. Thus, waste identification begins with identifying the source of its formation and analyzing its composition, after which the waste is assigned a type, hazard class and classifier code.
15. According to international standards (ISO 14001:2015, GRI 306 Waste), correct identification is a fundamental prerequisite for the formation of waste management processes, including the choice of recycling, disposal or safe disposal methods.
16. Waste classification is based on the concept of waste Life Cycle Assessment (LCA), which allows taking into account not only the moment of waste formation, but also its further impact on the environment and human health..

3.2. Sources of waste generation in the telecommunications sector

17. The telecommunications sector generates a fairly wide range of waste, from household waste to specific waste related to the operation of networks and equipment.

18. In Company, waste is generated, because of various areas of the main activity and vital activity of the administrative and management unit, which determines their complex morphological composition.
19. Main sources include:
    1) Industrial waste - decommissioned telecommunication equipment, cable scrap, printed circuit boards, electronic components containing copper, aluminum, lead and plastics.
    2) Office waste - paper, cardboard, plastic and glass containers, office equipment, furniture, lighting systems and equipment, fire extinguishing, heating, cooling, waste paper after completion of storage periods
    3) Transport waste - used tires, batteries, oils, technical fluids.
    4) Household waste – solid household (municipal) waste (MSW, MSW) generated in the places of workers' accommodation.
20. Scientific research shows that it is electronic waste (e-waste) that demonstrates the highest growth rates in the world (about 3-4% annually), which highlights the need for their systematic classification and recycling.

3.3. Types of waste and their classification

21. The type of waste is understood as a set of waste having common characteristics in accordance with their origin, properties and management technology.
22. Types of waste are determined on the basis of the Waste Classifier (Order of the Minister of Ecology, Geology and Natural Resources of the Republic of Kazakhstan dated August 6, 2021 No. 314) (hereinafter referred to as the Classifier).
23. Each type of waste in the waste classifier is identified by assigning a six-digit code.
24. In the Republic of Kazakhstan, waste is classified into three groups: hazardous, non-hazardous and mirrored.
25. Hazardous waste.

Hazardous waste has a six-digit waste code indicated by a sign (*). It has one or more of the following properties of hazardous waste:

1) anatomical substances: clinical/medical waste;
2) pharmaceuticals, medical and veterinary components;
3) impregnation composition for wood;
4) Biocides and phyto-pharmaceutical substances;
5) the remainder of the substance used as solvents;
6) halogenated organic substances not used as solvents, with the exception of inert polymeric materials;
7) a mixture of salts containing cyanides;
8) mineral oils and oil-containing substances (for example, slurry chips, etc.);
9) oil/water, hydrocarbons/water mixtures, emulsions;
10) substances containing PCBs and/or PCTs (for example, dielectrics, etc.);
11) resinous substances obtained during distillation, distillation or pyrolytic treatment by pyrolysis (for example, cubic residues, etc.);
12) inks, dyes, pigments, paints, varnishes;

13) resins, latex, plasticizers, adhesives;
14) chemicals formed in research institutes/universities during research that have not been identified and/or that are new, and their effects on humans and/or the environment are still unknown (for example, laboratory residues, etc.);
15) pyrotechnics and other explosives;
16) chemicals for processing materials;
17) any materials contaminated with any substance from polychlorinated dibenzofurans;
18) any materials contaminated with any substance from polychlorinated dibenzo-p-dioxins,
19) as well as containing any of the following hazardous waste components and consisting of:
20) animal and vegetable soaps, fats, waxes;
21) non-halogenated organic substances not used as solvents;
22) inorganic substances that do not contain metals or metal compounds;
23) ashes and/or ashes;
24) earth, sand, clay, including dredging soils;
25) mixed salts that do not contain cyanides;
26) metal dust, powder;
27) catalytic materials;
28) liquids or slurries containing metals or metal compounds;
29) disused pollution control equipment, including gas/liquid purification (for example, a bag filter for dust, etc.);
30) scrubbing slurries;
31) sludge from the scrubber;
32) decarbonization residue;
33) spent ion exchange column;
34) sewage, uncleaned or unsuitable for agricultural use;
35) residue from cleaning tanks and/ or equipment;
36) contaminated equipment;
37) contaminated containers (e.g. packaging, gas cylinders, etc.), components that have the properties of hazardous waste;
38) batteries and other electrical elements;
39) vegetable oils;
40) materials obtained by selective selection of household waste, which have any of the properties of hazardous waste;
41) Any other waste that contains any of the hazardous waste components and any of the properties of hazardous waste.

26. Hazardous waste components include:
1) C1 beryllium; beryllium compounds;
2) C2 vanadium compounds;
3) C3 chromium (VI) compounds;
4) C4 cobalt compounds;
5) C5 nickel compounds;

6) C6 copper compounds;
7) C7 zinc compounds;
8) C8 arsenic; arsenic compounds;
9) C9 selenium; selenium compounds;
10) C10 silver compounds;
11) C11 cadmium; cadmium compounds;
12) C12 tin compounds;
13) C13 antimony; antimony compounds;
14) C14 tellurium; tellurium compounds;
15) C15 barium compounds; except for barium sulfate;
16) C16 mercury; mercury compounds;
17) C17 thallium; thallium compounds;
18) C18 lead; lead compounds;
19) C19 inorganic sulfides;
20) C20 inorganic fluorine compounds, except calcium fluoride;
21) C21 inorganic cyanides;
22) C22 alkaline or alkaline earth metals: lithium, sodium, potassium, calcium, magnesium in a simple form;
23) C23 acid solutions or sulfonates in solid form;
24) C24 basic solutions or base in solid form;
25) C25 asbestos (dust and fibers);
26) C26 phosphorus: phosphorus compounds other than mineral phosphates;
27) C27 metal carbonyls;
28) C28 peroxide;
29) C29 chlorates;
30) C30 perchlorates;
31) C31 azides;
32) C32 PCBs and/or PCTs;
33) C33 pharmaceutical or veterinary compounds;
34) C34 biocides and phyto-pharmaceutical substances (e.g. pesticides, etc.);
35) C35 infectious substances;
36) C36 creosote;
37) C37 isocyanates; thiocyanates;
38) C38 organic cyanides (e.g. nitriles, etc.);
39) C39 phenols; phenolic compounds;
40) C40 halogenated solvents;
41) C41 organic solvents, other than halogenated solvents;
42) C42 organohalogenic compounds, except for inert polymer materials and other substances mentioned in this annex;
43) C43 aromatic compounds; polycyclic and heterocyclic organic compounds;
44) C44 aliphatic amines;
45) C45 aromatic amines;
46) C46 ethers;
47) C47 explosives, including those listed in this annex;

48) C48 organic sulfur compounds;
49) C49 any substances from polychlorinated dibenzofurans;
50) C50 any substances from polychlorinated dibenzo-p-dioxins;
51) C51 hydrocarbons and their compounds containing oxygen, nitrogen and/or sulfur compounds, not considered above.

27. Non-hazardous waste.

Non-hazardous waste has a six-digit waste code, not marked with a sign (*), which does not have the properties of hazardous waste.

28.Mirror waste.

Mirror waste is waste that can be classified as both hazardous and non–hazardous types, depending on the content of hazardous substances in them.

If the waste is classified as mirror waste, then the waste is classified as hazardous in the following cases:

for the properties H3, H4, H5, H6, H7, H8, H10, H11 and H13, the waste corresponds to one or more limiting indicators of hazardous substances in order to classify them as hazardous or non-hazardous waste.

29.The limiting indicators of hazardous substances include the following:

H3 – flash point < 55°C;

H4 – one or more irritating substances that cause serious eye damage, in a total concentration of ≥ 10%;

H4 – one or more irritating substances that cause serious irritation to the eyes, skin and substances that pose an aspiration hazard, with a total concentration of ≥ 20%;

H5 – one or more substances with acute toxicity to the body of hazard class 4 at a total concentration of ≥ 25%;

H6 – one or more substances with acute toxicity to the body of hazard class 1 and 2 at a total concentration of ≥ 0.1%;

H6 – one or more substances with acute toxicity to the body of hazard class 3 at a total concentration of ≥ 3%;

H7 – one substance is recognized as a carcinogen of hazard class 1, at a concentration of ≥ 0.1%;

H7 – one substance recognized as a carcinogen of hazard class 2 at a concentration of ≥ 1%;

H8 – one or more corrosive substances causing skin damage (necrosis) of hazard class 1, in a total concentration of ≥ 1%;

H8 – one or more corrosive substances causing skin damage (necrosis) of hazard class 2, in a total concentration of ≥ 5%;

H10 – one substance is considered toxic to reproduction of hazard class 1, affecting the reproductive function, at a concentration of ≥ 0.5%;

H10 – one substance is considered toxic to reproduction of hazard class 2, affecting the reproductive function, at a concentration of ≥ 5%;

H11 – one mutagenic substance of hazard class 1 at a concentration of ≥ 0.1%;

H11 – a single mutagenic substance of hazard class 2, at a concentration of ≥ 1%;

H13 – a "sensitizing" substance in a concentration of ≥ 10%.

30.With respect to mirror waste, the following applies:

It is allowed to assign a code to waste without an asterisk (*) if laboratory test results are presented confirming that these wastes do not have any properties of hazardous waste, do not exceed the limiting values of hazardous substances in order to classify them as hazardous or non-hazardous waste, do not belong to the category of hazardous waste and do not have dangerous components. If there is no waste, then such waste is non-hazardous.

31. Waste is assigned a code marked with an asterisk (*) until laboratory testing is completed.
32. Laboratory testing of waste properties is suspended when interim results show that the waste has one or more properties of hazardous waste. In this case, the waste is classified as hazardous and a code marked with an asterisk (*) is assigned to it.
33. In the absence of a corresponding waste in the Classifier, the coding is justified in each specific case by the waste owner on the basis of test reports of samples of this waste for chemical and component composition performed by a laboratory accredited in accordance with the procedure established by article 10 of the Law of the Republic of Kazakhstan "On Accreditation in the field of conformity assessment" and agreed with the authorized body in the field of environmental protection. environment.

3.4. Waste certification

34. Mandatory certification is carried out for hazardous waste, which meets the requirements of article 343 of the Environmental Code of the Republic of Kazakhstan and the Order of the Minister of Ecology, Geology and Natural Resources of the Republic of Kazakhstan dated August 20, 2021 No. 335 and includes:
    1) morphological composition;
    2) physico-chemical properties;
    3) hazard class according to national and international scale;
    4) possible scenarios of impact on the biosphere;
    5) recommended recycling or recycling technologies.
35. Certification is a tool for risk management and the formation of an integrated environmental hazard index of the Company. Thus, the Company has developed waste passports for 21 types of waste out of a possible 25 types of waste (Appendix 1).
36. According to the Environmental Code of the Republic of Kazakhstan (as amended in 2021, with amendments for 2025) and the Order of the Minister of Ecology, Geology and Natural Resources of the Republic of Kazakhstan No. 254 dated August 3, 2021 “On Approval of the Rules for Waste Classification and Maintenance of the State Waste Cadastre”, the enterprise is obliged to develop and approve a waste passport within a certain period after identification of a new type of waste. If a new type of waste has been generated at the enterprise that was not previously listed in the list of waste included in the current waste management program (or in existing passports), then the waste passport must be developed within 30 calendar days from the moment the new type of waste was identified in accordance with paragraph 28 of the Rules for Waste Classification and State Waste Cadastre (approved by by Order No. 254 dated 03.08.2021).

37. The passport is approved by the responsible person of the enterprise and sent through a single website https://ndbecology.gov.kz. At the same time, changes are made to the Waste Management Program.
38. Before the passport is approved, temporary accumulation of waste is allowed, provided that the requirements for storage and labeling are met.

3.5. Corporate waste identification methodology

39. Company applies a corporate waste identification algorithm in accordance with Appendix 1 of the Documented Procedure "Management of Production and Consumption Waste" approved by order of the Company, which includes:
    1) initial identification of waste at the level of a division/branch/Company;
    2) determination of its morphological composition and hazard class;
    3) information about the waste generator (division of the Company/branch);
    4) volume of waste generated;
    5) entry of data into the documented procedure for management of production and consumption waste;
    6) issuing a waste passport (for hazardous waste);
    7) information about waste operations (transfer, disposal, utilization);
    8) annual updating and verification of waste passports.
40. Thus, a unified database is formed, ensuring scientifically sound decision-making.

3.6. Performance Performance Indicators (KPIs)

41. KPIs (Key Performance Indicators) in waste management are necessary to translate environmental goals from "general declarations" into specific measurable results.
42. The main objectives of implementing KPIs in waste management are:
    1) Performance monitoring

KPIs show the extent to which the Company is actually reducing waste generation, increasing recycling, and minimizing its negative impact on the environment.

    2) Transparency and accountability

KPIs enable management, shareholders, government agencies, and ESG investors to see what steps the Company has taken in the field of environmental protection.

    3) Comparison and dynamics

Results can be compared across divisions, branches, or years (for example, "the share of recycled waste increased from 25% to 40%").

    4) Staff motivation

KPIs set specific goals for environmental managers, technical services, and contractors (e.g., "reduce the volume of landfilled waste by 10% per year").

5) Management decision-making

KPIs reveal where the “bottlenecks” are — for example, too much waste accumulates in one department or recycling is organized inefficiently.

43. The following KPIs for waste management may be established in the Company: Electronic and electrical waste (E-waste)
    1) Percentage of electronic waste recycled out of the total volume.
    2) Number of pieces of equipment transferred for reuse (servers, modems, telephones).
    3) Storage period for decommissioned equipment before transfer for disposal (no more than X months).
    4) Percentage of equipment returned to the manufacturer under the Extended Producer Responsibility (EPR) principle.
44. Accumulators and batteries
    1) Percentage of accumulators recycled out of the total volume generated.
    2) Average storage period for used accumulators in the warehouse (no more than Y days).
    3) Percentage of batteries sent for recycling rather than landfill.
45. Cable waste and installation materials
    1) Percentage of cable sent for recycling (copper, aluminum, plastic) or disposal (fiber optic cable).
    2) Percentage of cable and equipment reused during network upgrades.
    3) Specific volume of waste from installation work (kg/km of cable laid).
46. Office and non-production waste
    1) Percentage of office waste sent for recycling (paper, cardboard, plastic, glass).
    2) Number of separate waste collection points installed at the Company's facilities.
    3) Percentage of waste sent to landfill out of the total volume (the lower, the better).
47. Financial and ESG efficiency
    1) Reduction in waste disposal costs (%) through recycling and reuse.
    2) Savings from the sale of secondary resources (tenge/year).
    3) Number of fines/claims for environmental violations (target value — 0).
    4) Share of waste reporting according to the GRI 306 compliance index that has undergone ESG auditing.
48. Behavioral KPIs (corporate culture)
    1) Number of employees who have undergone training in waste management (% of staff).
    2) Number of environmental initiatives/projects implemented in the Company.
    3) Participation in the Green Office or Electronic Scrap programs.
49. Methodology for forming the Company's KPIs

For each indicator, baseline values (2025), interim targets (2026-2031), and strategic goals (2032) have been defined. KPI values consider the specifics of the Company's activities, including the generation of electronic waste, cable products, batteries, as well as office and non-production waste. The calculation methodology is based on the principles of measurability, achievability, relevance, and time-bound (SMART).

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List of KPIs in the field of waste management

Direction	KPI	2025 (basic level)	2026 (improvement)	2027	2028	2029	2030	2031	2032 (target achievement)
Electronic waste (E-waste)	Percentage of recycled electronic waste , %	35%	45%	65	70	75	80	85	90%
	Number of equipment units transferred for reuse	500 ед.	550 ед.	600 ед.	650 ед.	750 ед.	850 ед	950 ед	1000 ед
	Storage period for decommissioned equipment prior to transfer, months.	≤ 6	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 3
Accumulators and batteries	Percentage of batteries sent for recycling, %	30%	45%	50%	55%	60 %	65%	70 %	75%
	Average storage period for used batteries, days	≤ 90	≤ 60	≤ 55	≤ 50	≤ 45	≤ 45	≤ 45	≤ 35
Copper cable and installation waste	Percentage of cable sent for recycling, %	30%	35%	40%	45%	50 %	60%	65 %	70%
	Specific volume of waste from installation work (kg/km)	15	12	11	11	11	10	10	10

Fiber optic cable and installation waste	Percentage of cable sent for recycling, %	10%	20%	30%	40%	50 %	60%	70 %	80%
Office waste	Percentage of office waste sent for recycling, %	25%	40%	45%	50%	60 %	70%	75 %	80%
	Number of separate waste collection points, pcs.	150	250	280	310	350	420	560	750
	Percentage of waste sent to landfill %	80%	75%	65%	60%	55 %	50%	40 %	20%
Financial efficiency	Savings from the sale of secondary resources, million tons	50	80	100	120	130	140	150	160
	Reduction in waste disposal costs, %	10%	20%	25%	30%	35 %	40%	45 %	50%
	Number of fines for violations, pcs.	≤ 2	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1
	Waste certification	80%	90%	100 %	100 %	100 %	100 %	100 %	100%
Corporate culture	Percentage of employees who have undergone waste management training	30%	40%	50%	60%	65 %	70%	75 %	80%
	Number of environmental initiatives within the Company	5	10	15	20	25	30	40	50

50.Explanations of KPIs

1) Electronic waste: monitoring equipment recycling, reducing storage times, and implementing the Company's Enterprise Resource Planning (EPR) system.
2) Batteries: reduction of storage times and maximization of recycling.
3) Cable waste: promotion of copper, aluminum, and plastic recycling, as well as reduction of specific waste during installation.
4) Office waste: development of a separate collection system and reduction of the share of landfill waste.
5) Financial efficiency: saving money by selling secondary resources and minimizing fines.
6) Corporate culture: increasing employee engagement and developing internal environmental initiatives.

4. Collection and temporary storage of waste

4.1. Theoretical and methodological foundations

51. Waste collection and temporary storage are critical stages in the waste management system, determining the subsequent possibility of recycling, disposal, or safe burial. According to the concept of the waste management hierarchy, this stage serves as a link between the process of waste generation and its final disposal.
52. From an ESG perspective, a properly organized collection system minimizes the risk of secondary environmental pollution, eliminates the possibility of uncontrolled release of toxic substances, and ensures a higher rate of secondary resource recovery.
53. The organization of waste collection and temporary storage in the Company is an important stage in waste management. This process ensures separate collection, prevents environmental pollution, and prepares waste for further processing, disposal, or transfer to specialized organizations.
54. All waste storage activities are carried out in accordance with:
    1) Environmental Code of the Republic of Kazakhstan (articles on waste storage);
    2) Sanitary rules of the Republic of Kazakhstan.
    3) ISO 14001 (environmental management);
    4) Internal corporate standards and regulations of the Company.

4.2. Principles of waste collection organization

55. Separation of waste streams – waste is sorted into categories: paper, plastic, glass, metals, electronic waste, batteries, mercury-containing lamps, oils, and solid municipal waste.
56. Labeling and identification – each collection container must have a unique identifier (color coding, QR code) that allows its contents to be recorded in a digital system.
57. Non-intersecting flows – mixing of different hazard classes of waste is excluded, which is in line with ESG and SDG 12 principles.
58. Environmental safety – use of sealed containers and special containers for hazardous waste, equipped with means to prevent spills, corrosion, and the spread of toxic vapors.

4.3. Infrastructural requirements for temporary sites

59. According to the Environmental Code of the Republic of Kazakhstan and ISO 14001, temporary waste storage sites must:
    1) have a solid waterproof covering (concrete, asphalt);
    2) be equipped with canopies or enclosed spaces for storing hazardous waste;
    3) be equipped with a drainage system to prevent the infiltration of pollutants;
    4) be equipped with fire-fighting equipment and a ventilation system;
    5) have fences and access restrictions to prevent unauthorized entry.
    6) Such measures minimize the likelihood of secondary contamination of soil and groundwater with heavy metals, hydrocarbons, and other persistent organic pollutants.

4.4. Containers and packages

60. For waste paper and cardboard – containers marked “paper” that are resistant to ignition.
61. For plastics and polymers – containers made from recycled polymers with color coding.
62. For glass and metals – specialized containers with impact-resistant construction.
63. For batteries – sealed boxes made of corrosion-resistant materials.
64. For oils and petroleum products – metal or plastic sealed containers with double walls.
65. For mercury-containing lamps – special rigid containers with shock-absorbing padding to prevent glass breakage.

4.5. Organizational measures and responsibilities

66. Each branch of the Company is required to have a waste record book recording the volume, waste code (class), generation period, storage period, transfer period or other waste management operation in accordance with Appendix 3 of the documented waste management procedure for production and consumption.
67. The period of temporary storage of waste should not exceed 6 months before the date of its transfer to specialized organizations or export to the facility where they will be disposed of or disposed of (according to the Environmental Code of the Republic of Kazakhstan).
68. Responsible employees of the branches carry out monthly monitoring of the condition of the sites.
69. If violations are detected, an act is drawn up and corrective measures are developed.

4.6. Performance Indicators (KPIs)

70. Percentage of waste collected separately ≥ 100%.
71. Percentage of waste stored in specialized containers ≥ 95%.
72. Storage period violation index = 0.
73. Emergency situation index = 0.

5. Waste transfer and disposal
5.1. Theoretical and methodological foundations

74. Waste transfer and disposal is the final block in the waste lifecycle Management system. According to the Environmental Code of the Republic of Kazakhstan, waste can only be transferred to organizations that have licenses for collection, transportation, disposal or processing. In international practice, recycling is considered as a key mechanism for implementing the principles of circular economy and achieving the goals of SDG 12.
75. The waste transfer process is a form of environmental responsibility outsourcing in which the Company delegates waste management to specialized operators, while maintaining control over the final results and reducing the overall environmental burden..

5.2. Waste transfer algorithm

76. Preparatory stage – waste is sorted and classified, acCompanying documents (invoices, waste passports, write-off certificates) are drawn up.
77. The contractor is selected based on licenses, work experience and international certificates (ISO 14001, ISO 45001).
78. The conclusion of the contract includes ESG requirements, waste traceability obligations, and the procedure for providing disposal certificates.
79. The actual transfer is carried out in a specialized container in compliance with safety requirements.
80. Cycle completion – the contractor provides a disposal certificate confirming the method of waste management (recycling, neutralization, burial).

5.3. Disposal methods

81. Depending on the morphological composition of waste, various technological approaches are used:
    1) Mechanical processing – cable scrap, scrap metal, waste paper (crushing, pressing, smelting).
    2) Chemical processing – batteries, electronic boards (separation of non-ferrous and rare earth metals).
    3) Thermal utilization – waste oils (incineration in specialized furnaces with emission purification).
    4) Physical and chemical decontamination – mercury-containing lamps (mercury extraction, demercurization).
    5) Landfill – residual fractions that cannot be recycled (after decontamination).
82. The choice of disposal method should take into account the environmental efficiency index (the ratio of useful secondary resources to the total mass of waste) and the energy balance (energy costs for processing compared to energy conservation).

5.4. ESG requirements for contractors performing waste operations

83. The Company strives to integrate ESG principles into its system for selecting contractors that carry out waste management operations. In particular, it is planned to require the following:
    1) environmental reporting in accordance with GRI standards;
    2) international certification (ISO 14001, ISO 45001, ISO 9001);
    3) use of technologies that minimize greenhouse gas emissions;
    4) compliance with employee rights and occupational health and safety standards;
    5) participation in circular economy programs.
    6) Thus, waste transfer becomes part of a sustainable supply chain.

5.5. Documentation and traceability

84. The waste transfer process to the contractor performing waste management is accompanied by a package of documents containing:
    1) contract;
    2) waste acceptance and transfer certificate;
    3) waste passport (for dangerous categories);
    4) the act of disposal (or recycling).
85. The data is stored in the corporate system (electronic database) for at least 5 years and is used for the formation of ESG reports and verification by independent auditors..

5.6. Performance Indicators (KPIs)

86. Waste transfer rate to licensed contractors = 100%.
87. Proportion of recycled waste ≥ 80% by 2032
88. The share of contractors with ISO 14001 ≥ 90% by 2027
89. The level of traceability of waste (availability of disposal certificates) = 100%.

6. Waste disposal

6.1. Theoretical and methodological foundations

90. Waste disposal is the process of incorporating secondary material resources (hereinafter referred to as SMR) into economic circulation through their sale or transfer to specialized organizations. In scientific literature, this process is interpreted as an element of the circular economy and a key mechanism for improving the resource efficiency of an enterprise.
91. According to the concept of sustainable production and consumption, waste disposal allows three tasks to be solved simultaneously:
    1) reducing the burden on ecosystems by reducing the volume of landfill;
    2) saving natural resources through the reuse of materials;

3) generating economic benefits in the form of additional profits for the Company.

6.2. Types of waste subject to disposal

92. In Company, the following are potentially in demand as were:
1) scrap metal (ferrous and non-ferrous metals) – cable scrap, structural elements of equipment;
2) waste paper (paper, cardboard) – office documents, archives after the expiration of their storage period;
3) office equipment and telecommunications equipment – devices suitable for repair and reuse (refurbished equipment);
4) plastic containers and packaging – containers, films, consumables.

93. These fractions have a high secondary utility coefficient, which makes it possible to reduce the so-called ecological footprint of the enterprise and increase the integrative indicator of its eco-efficiency.

6.3. Economic and environmental impact

94. Waste disposal has a dual effect:
1) Economic effect – revenue from the sale of VMP, reduction in landfill costs.
2) Environmental effect – reduction in landfill volumes, reduction in methane and CO_2 emissions associated with waste degradation at landfills.

95. In scientific terminology, this effect is defined as Environmental Load Reduction (ELR).

6.4. Waste disposal algorithm

96. Identification of VMP – recorded by the responsible employee of the branch/Company.
1) Valuation – carried out in accordance with the requirements of the Company's internal regulations for branches, with or without the involvement of an independent appraiser.
2) Selection of the method of sale – competition, tender, direct sale, or auction, organized by the responsible employees of the Company's branch.
3) Conclusion of the contract – includes ESG requirements and the counterparty's obligations for processing.
4) Actual transfer – carried out with the preparation of a transfer and acceptance certificate.
5) Financial accounting – revenues are recorded in the corporate system and partially allocated to environmental programs.

6.5. ESG and the circular economy

97. The integration of the waste disposal process into the Company's ESG strategy reflects:
E (Environment): reduction of landfill volumes, increase in recycling rates;

S (Social): involvement of employees in environmental initiatives (e.g., collection of waste paper or batteries for subsequent disposal);
G (Governance): transparency of operations, disclosure of data on income and volumes of waste sold in ESG reporting.

98. Thus, waste disposal is transformed from a secondary function into a strategic mechanism for the Company's sustainable development..

6.6. Key performance indicators (KPIs)

99. Share of waste recycled in total waste generation ≥ 25% by 2027, ≥ 40% by 2032.
100. Amount of funds allocated to environmental projects through sales ≥ 20% of revenue.
101. Waste reuse ratio – annual growth of at least 5%.
102. Level of disclosure in the ESG report – 100%.

7. Monitoring and reporting

7.1. Theoretical and methodological foundations

103. Monitoring and reporting in the field of waste management are environmental management tools that ensure systematic control, transparency, and the possibility of integrating indicators into corporate and international reporting forms.
104. From a scientific point of view, monitoring is a process of systematic observation and analysis of waste flow dynamics, including quantitative and qualitative parameters, as well as their translation into sustainable development indicators.
105. Reporting forms the basis for feedback from stakeholders and contributes to an increase in the Company's trust index in ESG ratings (MSCI, Sustainalytics, etc.).

7.2. Types of waste monitoring

106. The Company manages and monitors waste in accordance with the approved documented procedure “Management of Production and Consumption Waste,” which provides for a multi-level waste monitoring system.
    1) Operational monitoring – daily recording of waste generation at the level of branch/Company divisions.
    2) Branch monitoring – quarterly summary reports for each branch/Company.
    3) Corporate monitoring – centralized consolidation of data at the Company's Central Office in the Corporate Governance and Sustainable Development Department.
    4) External monitoring – control by state authorities and independent audit companies.
107. The multi-level model complies with the principles of data management hierarchy and reduces the risk of statistical distortions.

7.3. Reporting to government agencies

108. In accordance with the Environmental Code of the Republic of Kazakhstan, the Company is required to submit annual waste reports via the information system https://ndbecology.gov.kz in accordance with the form approved by Order No. 14 of the Acting Minister of Ecology, Geology, and Natural Resources of the Republic of Kazakhstan dated January 18, 2022 “On the approval of the waste inventory report form and instructions for filling it out.”

109. The report includes:

1) details of the legal entity (waste generator);
2) waste code, waste name;
3) waste generation volumes for the reporting period (tons/year);
4) details of the legal entity accepting the waste;
5) the waste disposal agreement (purchase, sale, exchange, donation, or other);
6) the share of waste transferred for processing and disposal;
7) the share of waste recovered (processed, disposed of, reused), neutralized, removed at own facilities (landfilled and removed);
8) the share of accumulated waste for subsequent recovery or transfer to third-party organizations, tons.

110. Violation of the requirements of the Environmental Code of the Republic of Kazakhstan in the area of mandatory reporting on waste management entails administrative liability in accordance with the Code of Administrative Offenses of the Republic of Kazakhstan.

7.4. Internal corporate reporting

111. As part of the implementation of the Roadmap for the Development of ESG Practices at Kazakhtelecom JSC for 2025-2032, the Company plans to automate waste accounting by introducing a resource planning system starting in 2026.

112. The Company's resource planning system (Enterprise Resource Planning - ERP system) for waste accounting can be built as a separate module within the overall corporate resource management system. It will combine environmental management, accounting, production processes, and interaction with contractors.

113. The main functions of the ERP system for waste accounting include:

1) Waste register

Maintaining waste classification by type (cables, batteries, electronic equipment, office waste, construction waste, etc.).
Linking to codes in the Environmental Code of the Republic of Kazakhstan.
Recording volumes and hazard classes.

2) Waste movement accounting.

Automated reflection of waste generation by branches and divisions. Control of accumulation at temporary sites. Formation of acts of transfer of waste to specialized organizations.

3) Document flow and compliance with the law

Electronic waste certification.
Generation of mandatory reports for government agencies (e.g., to the Kazakhstan Environmental Protection System).
Control over storage and removal deadlines.

4) Integration with ESG strategy and KPIs

Tracking indicators for disposal, recycling, and waste reduction.
Inclusion of KPIs in the departmental incentive system.
Visualization in the form of dashboards for management (Power BI, built-in BI modules).

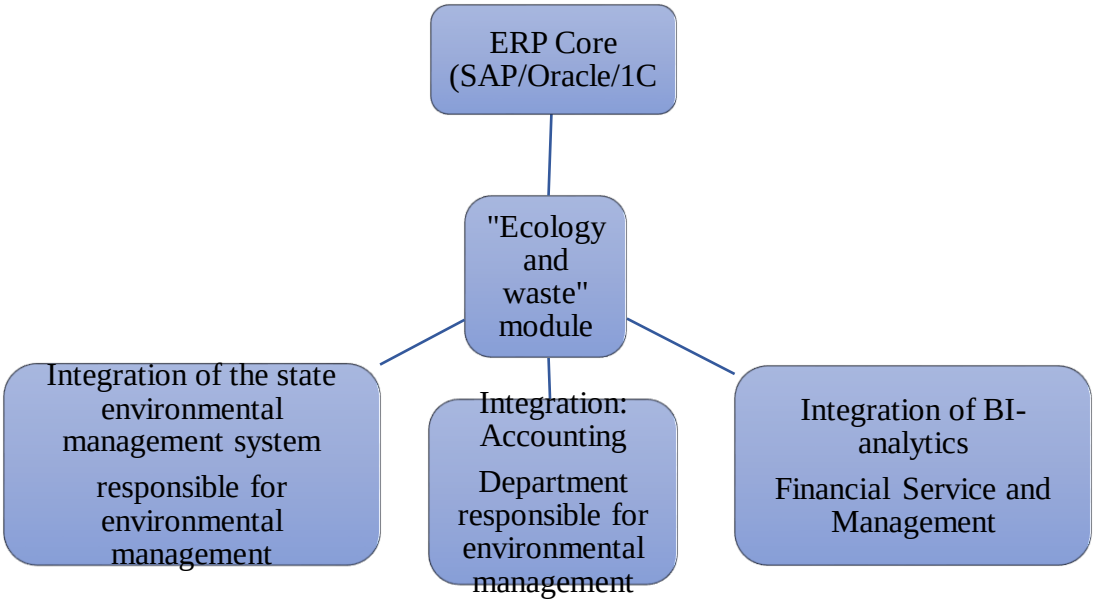
5) Financial accounting

Calculation of waste management costs (collection, transportation, disposal).
Control of contracts with contractors.
Possibility of integration with the SAP/1C/Oracle accounting module (depending on the ERP used).

6) Analytics and forecasting

Forecasting waste generation by type.
Scenario modeling (e.g., how waste volumes will change when the network is modernized).
Support for decision-making on environmental investments.

Possible solution architecture



ERP core (SAP/Oracle/1C) – management and financial accounting.
“Environment and Waste” module – proprietary development or refinement of an existing solution.
Integration with Kazakhstan's eGov – automatic transfer of environmental reporting.
BI analytics – monitoring panel for management.

114. Waste accounting and classification
ERP records all types of waste generated in departments:
electronic (equipment, batteries, cable);
construction (supports, cable channels);
office (paper, plastic, cardboard).
Hazard classes and waste passport data are entered into the system.
This allows for the maintenance of a centralized waste register.
115. Integration with warehouses and logistics
Waste (e.g., decommissioned equipment or cable) is recorded as warehouse stock.
ERP helps plan the movement of waste:
from the department → to temporary storage → to the contractor for processing/disposal.
Waste is accounted for as "goods," but with a special status.
116. Financial accounting
ERP allows you to calculate:
disposal costs;
income from the sale of secondary resources (scrap metal, copper from cables, waste paper);
savings from recycling.
This data can be immediately included in financial statements and ESG reports.
117. KPI and monitoring
KPI dashboards can be built into ERP:
% of recycled waste;
number of batteries transferred;
reduction in the share of waste sent to landfills.
This makes the system a tool for monitoring ESG strategy.
118. Document flow and reporting
The ERP stores all documents: waste passports, transfer acts, contractor licenses.
Automatic generation of reports for:
the Ministry of Ecology and Natural Resources of the Republic of Kazakhstan;
internal auditors;
ESG investors.
119. Integration with contractors
ERP can be used to integrate waste disposal contractors.
For example: waste is registered in the system → a request for removal is automatically generated → the contractor receives a notification → after removal, the act is uploaded.
As a result of implementing such a software product, the ERP system will become a waste management center, combining environmental accounting, financial efficiency, and ESG analytics.
120. A digital waste accounting system (ERP/AISM) will allow you to:

1) record waste generation in real time;
2) generate analytical reports for the Board of Directors and ESG Committee;
3) integrate data with branch KPIs;
4) prepare materials for external ESG reporting.

7.5. International reporting standards

121. The Company applies the following standards:
   1) GRI 306 Waste – disclosure of data on waste (generation, recycling, disposal);
   2) SASB (Sustainability Accounting Standards Board) – indicators for waste management in the telecommunications sector;
122. These standards enable the transformation of environmental information into universal sustainability metrics that are comparable at the international level.

7.6. ESG aspects of monitoring

123. E (Environment): accounting for the share of recycled waste, the utilization rate, and the reduction in landfill disposal.
124. S (Social): employee participation in environmental initiatives (number of participants, campaigns conducted).
125. G (Governance): regularity of reporting, completeness of data disclosure, ISO 14001 compliance audit.

7.7. Performance Indicators (KPIs)

126. Data completeness coefficient (the ratio of the volume of confirmed data to the total amount of reporting information) ≥ 0.95.
127. The proportion of branches that submitted reports on time = 100%.
128. The level of compliance with reporting GRI 306 = 100%.
129. The proportion of waste reflected in the ESG report = 100%.

8. Safety requirements, prevention and elimination of emergency situations

8.1. Theoretical and methodological foundations

130. Persons who have received special instruction on safe work methods are allowed to work on emergency situations. Persons who are not engaged in emergency response work are removed from the danger zone. According to the concept of sustainable risk management, the Company has a system for preventing accidental emissions and promptly responding to possible incidents in accordance with the international standards ISO 14001:2015 and ISO 45001:2018, regulating aspects of environmental protection and occupational safety.

8.2. Potential emergency situations

131. The following emergency situations related to waste management may arise during the Company's activities:
   1) Spills of petroleum products and technical fluids (threat of soil and water contamination).

2) Damage to containers with mercury-containing lamps and release of mercury vapors.
3) Leaks of battery electrolytes (sulfuric acid).
4) Fires and conflagrations at temporary waste storage sites.
5) Cases of unauthorized access and theft of waste containing hazardous substances.

132. Measures for the prevention and elimination of emergency situations are described in the approved documented procedure “Management of production and consumption waste.”.

8.3. Preventive security measures

133. In order to prevent accidents and environmental pollution, measures must be taken in accordance with the principles of the Preventive Risk Management System, thereby minimizing the likelihood of dangerous scenarios occurring.

134. These measures are as follows:
1) Infrastructure measures – equipping sites with fire extinguishing systems, ventilation systems, and leak detectors.
2) Organizational measures – developing instructions for the safe handling of waste and appointing responsible persons.
3) Technical measures – use of certified containers and double packaging for mercury-containing and chemically active waste.
4) Staff training – regular training and instruction on occupational health and safety.

8.4. Emergency Response Plan

135. The emergency response plan is part of the corporate system and is provided for in the documented procedure “Management of production and consumption waste” and includes:
1) algorithm for notifying responsible persons and services;
2) procedure for evacuating personnel;
3) measures to localize contamination (absorbents, decontamination kits, sorbents);
4) procedures for the collection, transportation, and transfer of contaminated materials to specialized organizations;
5) subsequent rehabilitation of the affected area.

8.5. Social aspect of security

136. From the point of view of the ESG strategy, the safety block refers not only to the environmental (E), but also to the social (S) component.
1) The Company undertakes to ensure the safety of employees and the public in the area of possible impact.
2) Conduct regular exercises and emergency simulations.
3) Employees are provided with personal protective equipment (PPE) and have access to instructions in digital format.

8.6. Emergency documentation and analysis

137. Each incident is recorded in the corporate system and subsequently analyzed according to the following scheme:
   1) Identification of the causes of the incident.
   2) Determination of the degree of impact on the environment.
   3) Adoption of corrective and preventive measures.
   4) Inclusion of data in the corporate safety report and ESG reporting.

8.7. Key performance indicators (KPIs)

138. Indicators of effectiveness in safety and accident prevention and response may include:
   1) Number of recorded waste-related emergencies = 0.
   2) Percentage of employees who have undergone training and instruction = 100%.
   3) Emergency response time ≤ 30 minutes from the moment of detection.
   4) Branch emergency preparedness index (based on training results) ≥ 0.9.

9. Improving environmental efficiency

9.1. Theoretical and methodological foundations

139. The environmental efficiency of a Company is defined as the ratio between the results achieved in reducing negative environmental impact and the costs of implementing environmental protection measures. In scientific literature, this category is often associated with the concept of eco-efficiency proposed by the World Business Council for Sustainable Development (WBCSD), where efficiency is interpreted as "creating more value with less environmental impact."

140. According to international standards (ISO 14031 "Environmental Performance Evaluation"), environmental efficiency is measured through a system of indicators (KPIs) that include both absolute (tons, m^3) and relative indicators (coefficients, indices).

9.2. Key areas for improving eco-efficiency

141. The Company strives not only for economic stability in the telecommunications technology market, but also to be committed to effective eco-mechanisms aimed at improving the Company's environmental performance. The key areas for improving eco-efficiency are:
   1) Digitization of waste management processes – introduction of a unified automated accounting system that allows online monitoring of waste generation, transfer, and disposal.
   2) Minimization of waste generation at source – optimization of business processes, transition to a "paperless office," use of energy-efficient technologies.

3) Reuse of equipment – development of refurbished and reuse practices for telecommunications equipment.
4) Development of recycling infrastructure – cooperation with companies implementing advanced recycling technologies (e.g., chemical extraction of metals from e-waste).
5) Investment in R&D (research and development) – researching opportunities for implementing closed material cycles and waste-free technologies.

9.3. Environmental indicators and metrics

142. The following indicators can be used to quantitatively assess effectiveness:
1) Recycling Ratio (RR) – the ratio of the mass of recycled waste to the total mass of waste generated;
2) Landfilling Reduction Index (LRI) – the proportion of waste diverted from landfills for recycling or disposal;
3) Energy Recovery Efficiency (ERE) – the ratio of energy recovered from waste recycling to energy consumed;
4) Carbon Footprint of Waste (CFW) – the amount of CO_2 equivalent prevented by recycling.

9.4. ESG aspects of improving efficiency

143. Improvements in environmental and social performance must be pursued in parallel. The main ESG aspects are:

E (Environment): reducing waste, lowering greenhouse gas emissions, minimizing soil and water pollution.

S (Social): involving employees in corporate environmental projects (campaigns to collect waste paper, batteries, and electronic equipment).

G (Governance): integrating eco-efficiency indicators into the Company's strategic KPIs, monitoring by the ESG committee and the Board of Directors.

9.5. Targets for 2032

144. The Company aims to reduce waste generation, increase the proportion of recycled waste, and reduce the proportion of waste sent to landfill, namely:
1) Proportion of recycled waste ≥ 80%.
2) Reduction in the volume of waste sent to landfill ≥ 30%.
3) Proportion of reused equipment ≥ 25%.
4) Reduction in the carbon footprint of waste (CFW) by 20%.
5) Involvement of at least 80% of employees in environmental initiatives.

10. International standards and best practices

10.1. Theoretical and methodological foundations

145. The integration of waste management systems into international standards ensures data comparability, global recognition, and compliance with best international practices. This process is defined as institutional harmonization of environmental management, which involves the integration of national systems with international sustainable development protocols.
146. For the Company, compliance with international standards not only allows it to meet regulatory requirements, but also to build reputational capital, which improves the Company's position in global ESG ratings.

10.2. International waste management standards

147. International waste management standards are a set of generally accepted rules and practices aimed at the safe handling of waste, minimizing its generation, and maximizing its reuse. These standards are focused on sustainable development and cover aspects such as reducing negative environmental impact, improving the efficiency of production processes, protecting human health, and complying with the principles of the green economy
148. In international practice, great attention is paid to the principles of "reduce, reuse, recycle," as well as the transition to waste-free and low-waste technologies.
149. The main international standards in the field of waste management include:
    1) ISO 14001:2015 "Environmental Management Systems" – a basic standard governing the planning, implementation, monitoring, and improvement of environmental processes, including waste management.
    2) ISO 14031 "Environmental performance evaluation" – establishes a methodology for developing performance indicators.
    3) GRI 306 Waste (2020) – a non-financial reporting standard that provides disclosure of information on waste streams: generation, recycling, disposal, and landfill.
    4) SASB (Sustainability Accounting Standards Board) – contains industry indicators for the telecommunications sector.
    5) UN SDG (UN Sustainable Development Goals) – primarily SDG 12 "Responsible consumption and production" and SDG 13 "Climate action."
    6) Basel Convention (1989) – an international treaty regulating the transboundary movement of hazardous waste and its disposal.

Thus, international waste management standards set universal approaches that enable companies in all industries to improve efficiency, reduce environmental risks, and meet modern sustainability requirements.

10.3. World's best practices

150. In world practice, waste management is considered as a strategic tool for sustainable development. Advanced countries are implementing comprehensive measures aimed at minimizing waste generation, reuse, recycling and safe disposal. Thus, in the European Union (EU), the principle of consistency applies: waste prevention → reuse → recycling

→ disposal (including energy) → burial as a last resort. This model significantly reduces the load on landfills and stimulates the development of recycling technologies. In countries such as Japan, South Korea, and the EU, the concept of waste management is based on the idea of a closed cycle, when waste from one industry becomes a resource for another. Products are initially designed with the possibility of repair, reuse and recycling in mind. One of the first countries, such as Germany, Sweden, and Singapore, where they began to practice the use of colored containers: for paper, plastic, glass, organics, and hazardous waste. Each waste has its own color, which allows sorting at the place of formation. This significantly increases the level of processing and reduces the cost of subsequent processing.

151. Global experience shows that waste can be recycled with the extraction of electricity and heat. In Sweden, more than 99% of household waste is recycled or used energetically, which practically eliminates landfill disposal. This experience is used in both Denmark and Japan.

152. The United States, the EU, and China are using digital technologies to account for and monitor waste generation, predict its volume, and optimize logistics. ERP and IoT systems are being implemented. This ensures transparency of processes and reduces the costs of companies. Extended producer responsibility is also a common practice. Legislation in Europe, Canada, and Japan obliges manufacturers to ensure that their products (electronics, batteries, and packaging) are collected and recycled after their lifecycle ends. This encourages the production of environmentally friendly products and packaging. Social responsibility is also important, which is reinforced through the process of environmental education and engagement. For example, in the Scandinavian countries and Australia, much attention is paid to the formation of an ecological culture. The population is actively involved in separate collection and "Zero Waste" programs. This makes it possible to significantly improve the efficiency of national waste management systems.

153. The application of these practices in Kazakhstan will accelerate the transition to a "Green Economy", increase business sustainability, reduce environmental risks and strengthen the reputation of companies as responsible participants in the international market.

10.4. Adaptation of best practices

154. Based on an analysis of best practices, it is advisable to implement the following in the Company:

1) Zero Waste Strategy (gradual elimination of waste disposal);
2) expansion of reverse logistics practices (return of equipment to suppliers for recycling or refurbishing);
3) the development of partnerships with ISO 14001-certified recyclers;
4) the inclusion of GRI 306 indicators in the annual corporate report;
5) integration into the CDP and MSCI ESG Ratings systems to increase investment attractiveness.

155. International standards and best practices form the so-called Global Sustainability Infrastructure (GSI). Their implementation in the corporate waste management system reduces systemic environmental risk and allows the Company not only to comply with regulatory requirements, but also to proactively demonstrate leadership in the ESG agenda.

10.5. Key performance indicators (KPIs)

156. ISO 14001 compliance level – annual certificate renewal.
157. Percentage of GRI 306 indicators disclosed = 100%.
158. Percentage of contractors with international certificates ≥ 90%.
159. Position in ESG ratings (MSCI, Sustainalytics) – increase by 1 level every 3 years.

11. Control and responsibility

11.1. Theoretical and methodological foundations

160. Control and distribution of responsibility are the final elements of the waste management system and ensure its functional stability. From a scientific point of view, this area belongs to the field of environmental management and corporate governance, where special attention is paid to issues of accountability, transparency, and regulatory compliance.
161. According to ISO 14001:2015, the effectiveness of a waste management system depends on the proper functioning of the PDCA (Plan – Do – Check – Act) cycle, where control (Check) and corrective actions (Act) ensure continuous improvement.

11.2. Control levels

162. The control levels over the waste management process in the Company is based on the principles of a systematic approach, transparency, and continuous improvement. Control is exercised at all stages of the waste life cycle — from the moment of its generation to its transfer to specialized organizations for disposal, recycling, or burial by materially responsible employees of the branches.
163. Monitoring is carried out through internal regulations and corporate standards, with mandatory consideration of the requirements of national legislation and international environmental standards. Particular attention is paid to the timely identification of waste, the correct maintenance of accounting records, and ensuring that actual processes comply with established environmental requirements.
164. The control system includes regular inspections and internal audits, analysis of the effectiveness of measures taken, and reporting to the authorized bodies. After implementation, the use of modern digital tools and automated systems for data collection, storage, and analysis will play an important role, minimizing the human factor and increasing the accuracy of accounting.

165. Thus, the control levels over waste management in the Company is focused on sustainable development, reducing environmental risks, and complying with ESG principles. Operational level – responsible environmentalists from the divisions keep records of waste, certify and control temporary storage sites.

11.3. Responsibility of officials

166. The Company consistently develops its sustainable development management system, ensuring its integration at all levels of corporate governance. The ESG agenda is a constant focus of the Board of Directors, which approves relevant policies, monitors the implementation of initiatives, and ensures the strategic alignment of the Company's activities with sustainability principles.
167. The Board of Directors determines the Company's strategy and main directions of activity in the field of sustainable development and monitors the implementation of sustainable development principles in the Company's activities.
168. For a more systematic approach to these issues, Kazakhtelecom JSC has established and operates an Audit and Sustainable Development Committee. The functions of the Audit and Sustainable Development Committee in monitoring the Company's activities in the field of sustainable development include developing recommendations to the Board of Directors on topics related to sustainable development, as well as on the implementation of ESG principles and low-carbon development in the Company.
169. The department responsible for managing sustainable development in the Company is the Corporate Governance and Sustainable Development Department. The department regularly conducts an inventory of internal regulatory documents, policies, practices, and internal control systems, and also works to identify and manage sustainable development risks. At least once every six months, the Department submits issues related to the Company's activities in the field of sustainable development to the Audit and Sustainable Development Committee for consideration, including the approval of new documents, the submission of reports on results, and other significant topics.
170. The Chairman of the Management Board and the CEOs of the branches are responsible for monitoring the implementation of sustainable development principles, policies, and standards, as well as for ensuring the accurate disclosure of information in accordance with the Company's action plan. The Chief Administrative Director is responsible for overseeing activities aimed at achieving ESG goals and key performance indicators.

11.4. Control mechanisms

171. Waste management control mechanisms in the Company can be described as a set of organizational, technical, and managerial tools aimed at preventing, reducing, and accounting for waste at all stages of the Company's activities. These mechanisms include:
    1) Internal audits – quarterly in each branch.

2) External audits – annually, involving independent organizations certified according to ISO 14001.
3) ESG audit – independent verification of the Company's non-financial reporting.
4) Information control – use of a digital waste accounting system with remote monitoring capability (starting in 2026)
5) Social control – involvement of employees in the “green ideas” system and corporate environmental volunteering.

11.5. Incentive and penalty system

172. Currently, the Company does not have a system of incentives and sanctions in waste management, and such a system is not fully implemented. The main incentive for improving efficiency in this area will be the achievement of target indicators (GPI), which will be developed and approved as part of the implementation of this program. The achievement of these indicators will be considered a key criterion for the performance of departments and individual employees in terms of environmental responsibility and waste management.

11.6. Key performance indicators (KPIs)

173. The implementation of this Program should ensure 100% fulfillment of all planned measures and requirements in the field of waste management. The result of the program's implementation will be the achievement of the planned targets, which will be reflected in the following performance indicators:
1) The share of branches that have passed internal audits without violations ≥ 95%.
2) Percentage of corrective actions completed ≥ 100%.
3) Frequency of external ISO 14001 audits = annually.
4) Level of disclosure of waste management information in the ESG report = 100%.
5) Stakeholder confidence index (based on survey results) ≥ 0.8.

174. These indicators will demonstrate the level of compliance of the Company's activities with the set objectives, confirm the full fulfillment of obligations, and serve as evidence of the Company's systematic approach to environmental responsibility and sustainable development issues.

Appendix 1

Waste passports of Kazakhtelecom JSC

Waste certification is a tool for identifying, classifying, and controlling environmental hazards, ensuring a scientifically sound choice of processing or disposal technologies.
According to the Environmental Code of the Republic of Kazakhstan and international requirements (GRI 306 Waste, ISO 14001, Basel Convention), a waste passport must

contain information about its morphological composition, hazard class, physical and chemical properties, potential impact on the environment, and recommended management methods.

Passports form the basis for calculating the integral environmental impact index and are included in corporate ESG reporting.

Table of registered waste passports of Kazakhtelecom JSC (with ESG metrics)

№	Type of waste	Catalog code	Hazard class / HP-properties	Morphological composition	ESG metric	Recommended management methods
1	Electronic and telecommunication equipment (e-waste)	20 01 35*	Class III, HP3 (toxicity), HP6 (ecotoxicity)	plastics, metals (Cu, Al, Pb), boards	% recycling (target ≥ 85%)	Dismantling, processing, extraction of metals, transfer to special organizations
2	Cable scrap	17 04 11	[HP3] fire hazard	copper, aluminum, insulation (PVC)	Share of sales (% by weight)	Insulation removal, metal recycling, sale as secondary material resources (VMR)
3	Lead-acid batteries	16 06 01*	Class II, HP8 (corrosion resistance), HP14 (ecotoxicity)	lead, sulfuric acid	Quantity disposed of (tons/year)	Transfer by a licensed processor, Pb extraction, electrolyte neutralization
4	Household batteries	16 06 05*	Class I, HP10 (toxicity), HP14	mercury, cadmium, nickel	Collection rate (units/year)	Collection in boxes, transfer to specialized enterprises
5	Mercury-containing lamps	20 01 21*	Class I, HP6 (ecotoxicity)	glass, phosphor, Hg vapor	100% recycling	Collection in special containers, demercurization, glass recycling
6	Used oils and petroleum products	13 02 06*	[HP3] - fire hazard	hydrocarbons, additives	% of regeneration (target ≥ 70%)	Collection in sealed containers, regeneration, thermal disposal
7	Waste paper and cardboard	20 01 01	non-dangerous	pulp, paper	% of recycling (target ≥ 95%)	Collection, pressing, transfer to processors
8	Household MSW	20 03 01	IV–V cl. [HP12] - formation of toxic gases in contact with water, air or acid	mixed fractions	Sorting percentage (%)	Separate collection, transfer to MSW operators
9	Packaging containers	15 01 05	[HP3] - fire hazard	Plastics, iron, glass	Sorting percentage (%)	Collection, transfer on a paid basis to a third-party organization
10	Used tires	16 01 03	[HP3] - fire hazard	steel, rubber, carbon black, textiles	% of recycling (target ≥ 95%)	Collection, transfer for recycling, disposal

						by third-party organizations
11	Ash and slag waste	10 01 01	[HP4] - irritating effect	asbestos (dust and fibers); alkaline or alkaline earth metals: lithium, sodium, potassium, calcium, magnesium in a simple form	Share of recycling and burial (%)	Placement (ash storage) in specially adapted locations
12	Furniture	03 01 05	[HP3] - fire hazard	Wood, resin	Share of recycling and reuse (%)	Accommodation in specially adapted places
13	Fine filters, Used air filters.	15 02 03	[HP6] - acute toxicity	Metallic iron cellulose, aluminum, soluble salts, rubber, mineral oil	Share of recycling and burial (%)	Collection in an airtight container in specially adapted places
14	Used filters	16 01 07*	[HP15] is the ability to exhibit the hazardous properties listed above, which are indirectly released from the original waste	Cellulose iron and its compounds; mineral oil, water, nickel-plated steel, suspended substances, rubber	Share of recycling and burial (%)	Collection in an airtight container in specially adapted places
15	Coated sand	17 05 03*	[HP3] - fire hazard	Hydrocarbons and their compounds containing oxygen, nitrogen and/or sulfur compounds, mineral petroleum oil	Share of recycling and burial (%)	Collection in sealed containers, regeneration, thermal disposal in specially adapted places
16	Oiled rags	15 02 02*	[HP3] - fire hazard	Fabric, textiles mineral oil oil mechanical impurities water	Share of recycling and burial (%)	Collection in sealed containers, regeneration, thermal disposal in specially adapted places
17	Container made of lacquer and paint material	08 01 99	**[HP6] - acute toxicity**	Carbon, Manganese, Silicon, Chromium Iron, Tin, copper compounds; Sulfur, Phosphorus, nickel compounds; Arsenic	Share of recycling and burial (%)	Packaging, regeneration, thermal disposal in specially adapted places
18	Used spare parts	16 01 99	[HP2] - oxidizing properties	alkaline or alkaline earth metals: lithium, sodium, potassium, calcium, magnesium in a simple form;	% of recycling	Collection, transfer for recycling, disposal by third-party organizations

				Manganese and its compounds; Iron and its compounds; Titanium and its compounds; Aluminum and its compounds Brass and its compounds Bronze and its compounds		
19	Decommissioned equipment, except for those mentioned at 16 02 09, 16 02 13 Written-off telecommunications funds	16 02 14	[HP3] - fire hazard	Copper, Iron, Aluminum, Glass, Polymers	% of recycling	Temporary storage in specially adapted places. Transfer to third-party specialized enterprises under an agreement. Transfer on a paid basis to a third-party organization (sale of waste)
20	Written-off telecommunications funds	16 02 16	[HP3] - fire hazard	Copper, Iron, Aluminum, Glass, Polymers	% of recycling	Temporary storage in specially adapted places. Transfer to third-party specialized enterprises under an agreement. Transfer on a paid basis to a third-party organization (sale of waste)
21	Decommissioned electrical and electronic equipment, with the exception of those mentioned in 20 01 21* and 20 01 35* Decommissioned Office Equipment	20 01 36	[HP3] - fire hazard	Copper, Iron, Aluminum, Glass, Polymers	% of recycling	Temporary storage in specially adapted places. Transfer to third-party specialized enterprises under an agreement. Transfer on a paid basis to a third-party organization (sale of waste)

Table of unregistered waste passports of Kazakhtelecom JSC (with ESG metrics)

№	Type of waste	Catalog code	Hazard class / HP-properties	Morphological composition	ESG metric	Recommended management methods
1	Decommissioned fiber optic cable	20 01 39	missing	Polymer shells, optical glass, hydrophobic fillers, glue	Share of recycling and burial (%)	Temporary storage in specially adapted places.

						Transfer to third-party specialized enterprises under an agreement.
2	Ferrous metal waste (scrap steel, cast iron, iron)	17 04 05	missing	Iron, carbon, manganese, silicon, sulfur, phosphorus,	% of recycling	Temporary storage in specially adapted places. Transfer to third-party specialized enterprises under an agreement. Transfer on a paid basis to a third-party organization (sale of waste)
3	Used coolants (antifreeze, antifreeze)	13 01 10*	toxicity	Ethylene glycol, silicates, phosphates, borates, oil or mechanical impurities	Share of recycling and burial (%)	Temporary storage in specially adapted places in a special sealed container made of chemically resistant metals. Transfer to third-party specialized enterprises under an agreement.
4	Used antifreeze products that do not contain dangerous substances	13 01 11	missing	Propylene glycol, water, phosphates, borates, carboxylates	% of recycling	Temporary storage in specially adapted places in a special sealed container made of chemically resistant metals. Transfer to third-party specialized enterprises under an agreement.

ESG aspects of waste passports:
E (Environment): certification reduces the level of uncertainty in waste management and minimizes the impact on ecosystems.
S (Social): employees are involved in the processes of separate waste collection and identification.
G (Governance): Passport data is integrated into corporate ESG reporting and is subject to external verification.
Performance indicators (KPIs) for certification
The waste certification coefficient is ≥ 0.95.
Share of hazardous waste provided with passports = 100%.
Passports are updated annually.
The level of disclosure of waste data in ESG reporting = 100%.

Appendix 2.

Waste Management Action Plan of
Kazakhtelecom JSC for 2025-2032

The action plan was developed as part of the implementation of the Waste Management Program of Kazakhtelecom JSC for 2025-2032 and is aimed at achieving targets for reducing waste generation, increasing the share of recycling, developing a corporate culture of environmental responsibility and implementing ESG principles.

№	Year	Direction	Event	KPI /Target indicator	Responsible departments	Expected result
1	2025-2026	Identification and certification	Conducting a complete inventory and certification of waste in all branches.	80% of the waste has been certified by the end of 2026.	Service Factory– affiliated branch of Kazakhtelecom Joint Stock Company	A database on all types of waste has been created, accounting and control have been provided.
2	2025-2026	Electronic waste (E-waste)	Organization of an electronic waste collection and transfer system (servers, modems, PCs).	Transfer of 20% of e-waste to recycling by 2026.	Telecom Supply Directorate – affiliated branch of Kazakhtelecom Joint Stock Company	A centralized electronic waste management system has been created.
3	2026–2032	Accumulators and batteries	Conclusion of contracts with licensed battery and battery recycling operators.	The share of recycled batteries is 80% by 2032.	Service Factory– affiliated branch of Kazakhtelecom Joint Stock Company , Telecom Supply Directorate – affiliated branch of Kazakhtelecom Joint Stock Company	Minimizing accumulation and avoiding the disposal of batteries.
4	2026-2032	Fiber optic cable	Conclusion of a contract for the disposal of fiber-optic cable	The share of recycled fiber-optic cable is 80% until 2032	Service Factory– affiliated branch of Kazakhtelecom	Minimizing waste accumulation

					Joint Stock Company	
4	2026–2028	Cable waste	Organization of separate cable collection and recycling (copper, aluminum, plastic).	60% of cable recycling by 2028.	Telecom Supply Directorate – affiliated branch of Kazakhtelecom Joint Stock Company	Re-involvement of recyclables in economic turnover.
5	2025–2032	Solid household waste (office waste)	Development of a separate collection system (paper, plastic, glass).	80% of office waste is recycled by 2032.	Service Factory– affiliated branch of Kazakhtelecom Joint Stock Company	Formation of a culture of separate collection and ecological behavior.
6	2026–2032		Optimization of recycling costs and sale of secondary resources.	Reduce recycling costs by 40% by 2032.	Telecom Supply Directorate – affiliated branch of Kazakhtelecom Joint Stock Company, Service Factory– affiliated branch of Kazakhtelecom Joint Stock Company	Saving money and reallocating the budget for eco-projects.
7	2027–2032	ESG financial efficiency and corporate culture	Implementation of educational programs and trainings on environmental management.	80% of employees have completed training by 2032.	Corporate University, Corporate Governance and Sustainable Development Department	The growth of staff involvement and the development of eco-competencies.
8	2026–2032	Monitoring and digitalization	Implementation of an ERP module for waste management and online monitoring of KPIs.	100% of the branches are connected to the system by 2032.	Information Technologies Division – affiliated branch of Kazakhtelecom Joint Stock Company,	A unified digital waste accounting and reporting system has been created.

					Corporate Governance and Sustainable Development Department	
9	2025–2032	Waste disposal	Sale of secondary resources (scrap metal, waste paper, plastic, glass).	40% of the waste has been disposed of by 2032.	Service Factory– affiliated branch of Kazakhtelecom Joint Stock Company , Telecom Supply Directorate – affiliated branch of Kazakhtelecom Joint Stock Company	Additional income and reduction of burial volumes.
10	2026–2032	Safety and emergency preparedness	Conducting annual exercises to eliminate waste emergencies.	100% of the branches have been trained and trained annually.	Occupational Safety Directorate – affiliated branch of Kazakhtelecom Joint Stock Company, Corporate Governance and Sustainable Development Department	Emergency preparedness and prevention have been improved.