Annexes

ANNEXES 1 AND 3 are available online at:

https://pfd-fswp.fr/atlas-waste-climate-mitigation?lang=en

ANNEX 2 Summary of how waste is integrated into NDCs by country, organised by AFD region

INTRODUCTION

This document is Annex 2 of the French Waste Partnership's Atlas on Waste Management and Climate Change Mitigation, which aims to illustrate the waste sector's potential to reduce greenhouse gas (GHG) emissions. This annex provides a country-by-country summary of how waste management is currently taken into account in the Nationally Determined Contributions (NDCs) of the 103 countries in which AFD operates. The countries are listed by world sub-region.

The information presented is taken from the NDCs made public on the official repository of the UNFCCC (United Nations Framework Convention on Climate Change), accessible at the following address: https://unfccc.int/NDCREG. The content of each national data sheet is based on the version of the NDC available online on the consultation date mentioned in the corresponding summary.

AFRICA ZONE

Southern Africa

South Africa, NDC consulted: 2021

South Africa's updated NDC (2021) does not mention any specific measures on waste management, energy recovery, bio-waste or sanitation. The waste sector is included in the GHG emissions inventory, but without a detailed strategy.

Angola, NDC consulted: 2021

The unconditional contributions provide for the composting of 500 tonnes of waste per day, enabling a reduction of 2,068 $ktCO_2e$ at an estimated cost of USD 7 million. The conditional contributions aim to double this capacity to 1,000 tonnes per day, thus reducing 4,136 $ktCO_2e$ with a financing requirement of USD 8.1 million. The country faces challenges related to the lack of infrastructure and advanced technologies, as well as insufficient awareness. However, opportunities exist through the development of carbon markets, the adoption of energy recovery technologies and the strengthening of the circular economy. Implementing these measures will require international support to achieve the targets set.

Botswana, NDC consulted: 2024

Botswana's NDC focuses on climate change mitigation and adaptation, prioritising the energy, agriculture and industry sectors. Waste management is not treated as a major focus, and there is no specific mention of waste-to-energy. However, Botswana is planning to develop 20 biogas plants by 2030, with a potential reduction of 118.8 Gg CO_2e, subject to international funding. Botswana plans to expand domestic biogas installations to 500 units by 2030, with an estimated reduction of 5.4 Gg CO_2e, subject to international financing.

Malawi, NDC consulted: 2021

The waste sector accounted for around 1.67 million tonnes of CO_2e in 2017, or 18% of Malawi's total emissions. Of these emissions, 1.07 million tonnes of CO_2e came from unmanaged landfills, or 13% of the country's total emissions. Emissions from domestic wastewater treatment amounted to 0.47 million tonnes of CO_2e. In its commitment to reduce greenhouse gas emissions, Malawi is planning measures for the waste sector with an estimated reduction potential of 0.9 million tonnes of CO_2e in 2040. These measures include landfill biogas recovery and waste-to-energy, representing 5% of the country's total emission reduction potential. However, these actions require external funding, as they are mostly classified as conditional contributions.

Mozambique, NDC consulted: 2022

Mozambique's NDC mentions waste management, with a focus on promoting sustainable waste management through the NAMA Waste programme, the implementation of a technological action plan and projects for the management and treatment of urban solid waste. It also plans to set up recycling industries and encourage investors to assess GHG emissions in their projects.

Namibia, NDC consulted: 2024

Namibia's NDC includes measures to improve waste management and reduce methane emissions. The waste sector represents 1% of the country's mitigation potential. The main actions focus on recycling, composting and recovering landfill gas to generate electricity, with a target of reducing open burning by 25% by 2030. Wastewater management will be improved by installing reticulation systems in several towns. The total cost of the measures is USD 499 million, mostly conditional on international support. Adaptation includes the reuse of wastewater and the creation of green corridors in urban areas. Implementation of these actions depends on international funding, local capacity building and technology transfer for waste and energy recovery.

Zambia, NDC consulted: 2021

Zambia's NDC refers to waste management, in particular through the following categories: landfilling of solid waste, biological treatment of solid waste, incineration and open burning, and treatment and discharge of wastewater. Zambia has developed Nationally Appropriate Mitigation Actions (NAMAs) that include integrated waste management. The country is projecting an increase in waste collection and landfill rates of up to 80% by 2050, and projections for emissions from the waste sector are based on a per capita increase linked to GDP and population growth.

Zimbabwe, NDC consulted: 2021

The waste sector contributes around 5.4% of national methane emissions, mainly from the decomposition of municipal solid waste. To reduce these emissions, Zimbabwe plans to capture and recover 42% of the methane generated for energy production via waste-to-energy projects by 2035. At the same time, 20% of organic matter will be composted by the same deadline to limit greenhouse gas emissions from biodegradable waste. These measures should make it possible to avoid around 1,288 Gg CO_2e of emissions by 2035.

Central Africa

Cameroon NDC consulted : 2021

Cameroon plans to set up inter-communal waste management centres in all ten regions, as well as controlled landfill sites, with a target of 70% methane capture by 2035. Energy recovery involves the production of biogas from municipal solid waste, the collection of methane from landfill sites and industrial wastewater, and the thermal gasification of waste for cogeneration. Methanisation is being encouraged on rural farms and large holdings to replace non-renewable firewood. Composting is being developed to recover organic agricultural and forestry waste. Sanitation is being strengthened with projects for anaerobic biological treatment of wastewater and integrated management of water resources. Methane emissions can be reduced by improving agricultural practices, particularly in rice growing. The circular economy is being promoted through initiatives to recycle plastics and structure a waste market. A budget of USD 1,001.99 million has been allocated to the waste sector to mitigate climate change. the waste sector accounts for a potential reduction of 2,701.78 Gg CO_2e by 2030, representing 6.4% of the total planned mitigation and 2.3% of current national emissions.

Congo Brazzaville, NDC consulted 2022 :

The waste sector is taken into account as a greenhouse gas emitter, with emissions projected to 2030. In the business-as-usual (BAU) scenario, emissions from the sector would reach 467.67 ktCO_2e in 2030. However, in the mitigation scenarios, these emissions become negative from 2025, reaching -496.10 ktCO_2e (unconditional) and -2613.47 ktCO_2e (conditional), suggesting the implementation of recovery or improved treatment measures. In particular, the plan provides for the installation of an incineration plant (200 t/day) and a municipal solid waste composting plant (1000 t/day).

Gabon, NDC consulted: 2022

In 2016, **Gabon committed to halving GHG emissions from waste and wastewater treatment by 2025.** Given the expected growth in the population, this commitment should make it possible to reduce GHG emissions by more than 2,000 GgCO_2 between 2015 and 2025, or 16% compared with the trend scenario (50% in 2025). However, in the 2022 NDC, Gabon considers the waste sector to be a marginal emitter of greenhouse gases, mainly due to open burning and wastewater management. It is not included in the country's quantified mitigation commitments. However, with population growth at 2.7% per year, waste-related emissions are set to increase. Gabon therefore plans to study and develop improvement measures, including sorting, recycling, composting and the recovery of municipal solid waste into biogas. No quantified reductions have been set, but a management strategy is envisaged to limit the sector's future environmental impact.

Central African Republic, NDC consulted: 2022

The Central African Republic's NDC focuses on improving the management of solid and liquid waste and excreta in order to improve the living environment and protect people's health. It plans to build the institutional capacity of municipalities to improve waste collection, management and recycling, with the aim of training 30% of municipalities by 2025. Energy recovery is encouraged through the promotion of bio-digesters and the recovery of industrial waste to increase energy efficiency and limit the use of fossil fuels. Optimising energy efficiency through bio-methanisation and improved furnaces is also one of the measures supported. However, the implementation of these initiatives faces financial and technical constraints. The National Water Policy 2020-2030 integrates these issues into a broader perspective of universal access to water and sanitation.

Democratic Republic of Congo, NDC consulted: 2021

The DRC plans to strengthen the institutional and legal framework for waste management and to set up a rational waste management programme. It is promoting the use of landfill gas and energy recovery from waste in order to reduce methane emissions from landfill sites. Aerobic composting is also encouraged. The production of energy and organic fertilisers from solid waste, wastewater and faecal sludge is also envisaged. Methane emissions from waste account for around 11% of national emissions, and are mainly due to the disposal of solid waste, the discharge of domestic wastewater and open-air combustion. The DRC aims to reduce emissions from the waste sector by 20% by 2030.

East Africa

Burundi, NDC consulted: 2021

Burundi is planning a number of initiatives to manage waste and reduce methane emissions. An 8.38 MW thermal power plant using municipal waste will be built in Bujumbura to recover energy from waste and reduce emissions from landfill sites. Solid waste management will be improved in the country's main cities (Bujumbura, Gitega, Ngozi and Rumonge) by setting up transit sites and final landfill sites. As for wastewater treatment, eight urban areas of Bujumbura are to be connected to the wastewater treatment network by 2025. In terms of reducing methane emissions, the correction factor is estimated at 46%, with a degradation time of six months. The country is also banking on the production of biogas through the installation of digesters in public infrastructures, with a target of 30 establishments covered by 2027.

Ethiopia, NDC consulted: 2021

The waste sector accounts for 3% of emissions in the reference scenario for 2030. Emissions come mainly from municipal solid waste, the decomposition of organic matter in landfills, wastewater and incineration. Targeted policy interventions include reducing per capita waste production, separating and composting organic matter, and improving wastewater treatment. These actions can reduce emissions by up to 2.9 $MtCO_2e$ in 2030 (74.7% conditional reduction compared to BAU). The unconditional option would allow a reduction of 17.1%.

Kenya, NDC consulted: 2020

The waste sector is mentioned globally as contributing to 1% of national GHG emissions in 2015, and is included among the sectors covered by the mitigation objective, but without any technical details or figures on the measures or actions planned. The only close reference is a general mention of "sustainable waste management systems" among the priority mitigation activities, with no further details.

Uganda, NDC consulted: 2022

Uganda is incorporating waste management into its climate strategy, with the aim of reducing emissions from the sector by 34.8% by 2030. To achieve this, the country is implementing integrated urban planning in five major cities and fifteen municipalities to improve the collection, recycling and treatment of solid waste and wastewater. Energy recovery is a key focus, with the installation of bio-latrines in schools to produce biogas and the exploitation of sugar cane waste for energy production. Treatment of agro-industrial wastewater is also being stepped up, with anaerobic digesters capturing methane and converting it into biogas, reducing emissions by 14,358 tCO_2e/year. Uganda also plans to improve the coverage of sanitation services and make wastewater treatment plants energy-neutral by using renewable energy. These initiatives are part of a strategy to limit pollution, optimise waste management and recover energy from waste treatment.

Rwanda, NDC consulted: 2020

The waste sector accounted for 12% of Rwanda's GHG emissions in 2015, or 0.64 $MtCO_2e$. Following a BAU the sector should reach 1.6 $MtCO_2e$ but the NDC indicates a reduction plan of 0.7 $MtCO_2e$. Waste management in Rwanda is mainly based on a "collect and dump" model, particularly in urban areas such as Kigali. The volume of waste treated has risen sharply, and the involvement of the private sector has led to an improvement in the collection service coverage rate (90% in Kigali in 2015 compared with 44% in 2012). The country plans to exploit landfill gas to produce energy, thereby reducing methane emissions. Wastewater treatment is still largely based on septic tanks and rudimentary drainage systems, with no centralised treatment systems, although projects are planned in Kigali (including a central station in Nyarugenge and a system in Kibagabaga/Kinyinya). Rwanda also intends to promote aerobic biological composting to recycle organic waste. These measures are integrated into its emission reduction strategy, with the potential for emission reductions conditional on international support. Methane is taken into account in the sources of emissions (notably landfill and wastewater), but the specific reductions linked to the energy recovery of methane, such as that from Lake Kivu, are not yet accounted for due to the lack of a recognised methodology.

Somalia, NDC consulted: 2021

The country plans to develop two sanitary landfills as part of its waste sector, with a projected reduction of 0.28 $MtCO_2e$ in greenhouse gas emissions, at an estimated cost of $50 million.

Sudan, NDC consulted: 2021

Sudan's updated NDC document addresses waste management and related methane emissions in a limited way. It recognises that municipal solid waste management is one of the country's major environmental problems, with increasing quantities of waste and negative impacts on public health and the economy. In 2017, 11.8 million tonnes of municipal solid waste (MSW) were generated, of which only 13% was disposed of at appropriate management sites. A large proportion (44%) was sent to unmanaged landfill sites, while 15% was burnt in the open air, contributing to air pollution and health impacts. Recycling is practised, but informally and without strict regulation.
GHG emission reduction targets for the waste sector are set at a reduction of 1,278,822 tonnes of CO_2e by 2030, a 20% reduction compared to the baseline scenario. Among the measures planned, Sudan aims to compost 60% of bio-waste and recycle 15% of total waste. The creation of controlled landfill sites in all major urban areas is also planned. Wastewater treatment is another major challenge, with around 50,600 m^3/day mainly from industrial activities , often dumped in shallow landfills or close to urban areas.
In terms of waste-to-energy, Sudan is planning to install systems to produce biogas from the sludge generated by wastewater treatment, thereby helping to generate electricity. However, these initiatives remain limited and require international financial support for their effective implementation.

Tanzania, NDC consulted: 2021

Tanzania's NDC document does not specifically mention waste management, waste-to-energy, bio-waste or sanitation in any detail. However, it does include waste management in its mitigation contributions, with an emphasis on reducing greenhouse gas emissions. The measures proposed concern the promotion of environmentally-friendly waste management practices, including the reduction, recycling and reuse of waste, as well as the adoption of waste-to-energy technologies. There is also talk of improving the management of landfill sites and developing programmes to recover landfill gas for electricity generation. Methane emissions are considered in the greenhouse gas inventory, particularly in relation to the agriculture and waste sectors.

North Africa

Algeria, NDC consulted: 2016

In terms of methane reduction, Algeria intends to give priority to the management of solid household waste. By 2030, the country aims to achieve complete coverage of its territory by waste collection systems, leading to a considerable reduction in CO_2e emissions.

The actions proposed in the NDC are :

- Waste recovery ;
- Composting organic waste and green waste ;
- Recovery and energy conversion of methane gas from landfill sites and wastewater treatment plants.

Egypt, NDC consulted: 2023

Egypt aims to modernise waste management by improving collection and treatment infrastructure, with a target of achieving 95% efficient collection by 2025 and limiting landfill to 20% of waste collected. Energy recovery is a key focus, with the ambition of treating 20% of waste through the production of biofuels, incineration and pyrolysis to reach a capacity of 300 MW. The country is also promoting the use of waste as an alternative fuel in the cement sector. Wastewater treatment is being stepped up with the extension of sludge recycling and recovery infrastructures. A regulatory framework supports these efforts, notably law 202/2020 and decrees promoting the integration of alternative fuels. Funding of USD 5.6 billion is based on public and private investment and international mechanisms.

Morocco, NDC consulted: 2023

Morocco's updated NDC sets out to improve waste management in order to reduce its environmental impact and help mitigate GHG emissions. By 2030, the country aims to recycle 20% of household and similar waste, recover 20% of its organic matter, achieve 10% energy recovery, recycle 25% of industrial waste and 70% of end-of-life vehicles. To achieve this, a number of measures are being implemented, including the construction of landfill and recovery centres, the integration of ragpickers into the formal economy, the development of public-private partnerships and the promotion of sorting at source. Two specific measures in the waste sector are conditional on international funding. This strategy is part of the 2030 National Climate Plan, the National Sustainable Development Strategy and the National Sanitation Programme, which also aims to achieve 100% wastewater treatment by 2030. The aim is to limit the landfill of waste, promote the circular economy and reduce GHG emissions linked to this sector.

Tunisia, NDC consulted: 2021

In terms of solid waste, the country aims to reduce the daily quantity of household waste, increase the rate of recycling and organic and energy recovery, in particular through the production of refuse derived fuels (RDF) used in the cement industry. The sanitation sector will see an improvement in the rate of wastewater treatment, the rehabilitation of wastewater treatment plants, the recovery of sludge for agricultural and industrial use, and the development of cogeneration and photovoltaics. Methane gas is targeted by systematically degassing landfills and producing electricity from their biogas. Taken together, these actions would reduce emissions from the waste sector by 23% by 2030, with an estimated financing requirement of USD 1.18 billion.

Gulf of Guinea

Benin, NDC consulted: 2021

In 2018, the waste sector accounted for 5.38% of the country's total greenhouse gas (GHG) emissions, and this share was projected to fall to 4.64% in 2030 in the absence of mitigation measures. The mitigation strategy in this sector is based on improving solid and liquid waste management, as well as waste-to-energy conversion. A key measure is the implementation of an integrated urban solid waste management programme, including selective sorting and the recovery of methane from landfill sites for energy production. This measure is estimated to result in a reduction of 1.2 Mt CO_2e over the period 2021-2030. There is no specific mention of bio-waste in the NDC, but energy recovery through methane capture in connection with solid waste management is highlighted.

Côte d'Ivoire, NDC consulted: 2022

Côte d'Ivoire aims to improve waste collection and urban hygiene, while ensuring sustainable management and recovery. The waste sector is helping to reduce greenhouse gas emissions, with a reduction target of 30.41% by 2030, rising to 98.95% with international financial support. Waste management is an integral part of the transition to a low-carbon economy, in particular by promoting green jobs and improving health conditions. Although energy recovery from waste is mentioned, the technical details of the technologies used are not specified. The implementation of mitigation measures, including this sector, requires funding of around US$10 billion and relies on an investment and monitoring-evaluation plan to ensure their effectiveness.

Ghana, NDC consulted: 2021

Ghana plans to use alternative urban solid waste management to reduce emissions by 21,313 kt CO_2e, with a high impact on reducing short-lived climate pollutants, particularly methane. No specific programme on bio-waste or its energy recovery is mentioned directly, although solid waste management may include sorting and treatment measures. The reduction of fugitive methane emissions in the oil and gas sector is also included, with a target of 20%. Other measures, such as the promotion of clean cooking and the development of sustainable transport, contribute indirectly to limiting the production of fossil waste and polluting emissions.

Guinea, NDC consulted: 2021

The Republic of Guinea's NDC document mentions the waste sector and its greenhouse gas emissions. Emissions from the waste sector in 2018 were 298 $ktCO_2e$, with projected growth of 3% per year until 2030. Currently, solid waste is not treated in the country, including in major cities, which has negative health, environmental and economic impacts. A major project is currently being studied to collect Conakry's waste and convert it into electricity by burning methane. This project plans to treat a total of 1,740 ktonnes of waste by 2025 and 4,148 ktonnes by 2030, representing a potential reduction of 110 $ktCO_2e$/year by 2030 and a total of more than 900 $ktCO_2e$.

Liberia, NDC consulted: 2021

Liberia's long-term strategy is to achieve carbon neutrality by 2050. The strategic mitigation options considered as part of the INDC are the energy sector (electricity, transport) and the waste sector (solid waste disposal). In 2000, the waste sector accounted for around 0.60% of Liberia's total national CO_2e emissions.

An important sub-category is CH_4 emissions from solid waste disposal sites (SWDS), which contributed 91.7%. The CH_4 mitigation targets are waste incineration with energy recovery, composting of organic waste, controlled wastewater treatment, recycling and waste minimisation.
The waste sector targets a 7.6% reduction in GHG emissions by 2030 compared to the business-as-usual scenario. Key measures include installing landfill gas recovery systems at Whein Town (by 2022) and Cheesemanburg (by 2025), and developing small-scale market waste composting (500 tons/year). The plan also aims to improve waste collection, sorting, reuse, recycling, composting, and/or biodigestion. Feasibility studies for biogas-based energy recovery are planned once gas capture systems are operational. On adaptation, Liberia aims to enhance landfill management (drainage, landslide prevention, regular covering, fire safety systems, etc.) and implement separate collection of organic waste to reduce health and environmental risks related to extreme weather events. These measures also address methane emissions from untreated organic waste. There is a clear link with the health sector, through joint actions on waste sorting, public awareness, and community-based management. Composting and biodigestion are identified as complementary high-potential solutions.

Nigeria, NDC consulted: 2021

Nigeria's NDC document explicitly mentions the inclusion of the waste sector in its updated climate commitment, which was not the case in the 2015 version. The waste sector accounts for around 9% of the country's total GHG emissions in 2018. The updated NDC includes waste management actions, particularly in relation to reducing methane emissions and improving waste recovery. A review of the circular economy and waste management is also mentioned.

Sierra Leone, NDC consulted: 2021

Sierra Leone's NDC mentions waste management as a priority sector for mitigating GHG emissions. It states that increasing urbanisation and population growth are generating a significant amount of waste, estimated at around 219,000 tonnes per year for Freetown alone (0.5 kg/inhabitant/day for a population of around 1.2 million). This context contributes to the increase in CH_4 emissions from landfill sites, as well as CO_2 and precursor gases (NO_x, CO). Sanitation is deficient, with many discharges of untreated wastewater directly into watercourses, which limits N_2O emissions from industrial wastewater treatment for the time being. Unconditional contributions include improving access to environmentally-friendly waste management infrastructure. As for conditional contributions, the country is considering incineration facilities to reduce CH_4 emissions from landfills, investments in reuse and recycling technologies, and bio-waste treatment systems with digestate recovery. The sector is also integrated into wider GHG reduction plans through the promotion of the circular economy.

Togo, NDC consulted: 2021

The waste sector in Togo presents major challenges linked to the collection of household waste and the disposal of wastewater, with individual waste production varying between 0.4 and 2 kg per inhabitant per day. Emissions from this sector have risen from 335.7 Gg CO_2e in 2010 to 573.3 Gg CO_2e in 2030, an increase of 70.8%. The national policy aims to improve urban sanitation, in particular by eliminating illegal dumps, disposing of urban waste and building biomedical waste incinerators. The aim is to recover 12% of urban solid waste through composting and to use 80% of the biogas produced by the Lomé landfill site to generate electricity. There is also a plan to recover 3.5 Gg (around 2.9 million m^3) of methane and to sort and recycle 145,000 tonnes of waste, including 50,000 tonnes through composting. Sanitation is a priority, with investment in the construction of family latrines and the reinforcement of the rainwater drainage network. Wastewater management includes converting 5% of domestic effluent into biogas using appropriate septic tanks. All the measures in the sector require a total investment of USD 262.5 million, with a potential reduction of 412.20 Gg CO_2e in cumulative emissions over the period 2020-2030.

Great Sahel

Burkina Faso, NDC consulted: 2021

The waste sector in Burkina Faso accounted for 2.7% of national GHG emissions in 2015, with a projected increase to 2,901.61 Gg CO_2e in 2030 and 4,959.79 Gg CO_2e in 2050 in the absence of reduction measures. In particular, it contributes to methane emissions from landfill sites and wastewater treatment. The NDC forecasts a reduction in GHG emissions in this sector of 262 Gg CO_2e in 2025, 614.8 Gg CO_2e in 2030 and 1,246.9 Gg CO_2e in 2050, exclusively under the conditional scenario. The actions envisaged include improving solid and liquid waste management and recovering energy from waste, although these measures are not detailed in the document. The planned funding for mitigating emissions from the sector amounts to USD 166.2 million, but is entirely dependent on external funding. No reduction action is planned under the unconditional scenario.

Gambia, NDC consulted: 2021

Only a third of this waste is collected in Banjul, the capital, and there are no services serving rural areas. The majority of waste ends up in illegal dumps close to homes. Toxic combustion fumes represent a major health risk. Improvements to the waste collection system are hampered by a lack of vehicles. The government is planning to implement an integrated solid and liquid waste management initiative, but the cost of implementation (estimated at $68 million) may be an obstacle. Reductions in greenhouse gas emissions through solid waste management will be achieved through methane capture, waste recycling and composting.

Mali, NDC consulted: 2021

Waste management in Mali is based on collection and evacuation to two final landfill sites in Bamako and Sikasso, but suffers from a lack of infrastructure, encouraging uncontrolled dumping. The sector's GHG emissions, mainly methane, totalled 436.12 kT CO_2e in 2019. No specific methane reduction or energy recovery measures are mentioned. There are projects to improve collectors, treat wastewater and process plastic waste, but no specific actions on waste prevention or bio-waste recovery.

Mauritania, NDC consulted : 2021

The updated NDC of Mauritania addresses the issue of waste concisely. It identifies a moderate mitigation potential in the sector, with a total of 1,573.99 Gg CO_2e (3.91% of total emissions), of which only 0.56% is unconditional. The main planned project is the establishment of a solid waste incineration plant with energy recovery (12 MW), currently under study through a public-private partnership. The document also notes the low efficiency of the urban solid waste management system, limited waste collection, and low levels of waste recovery. Regarding sanitation, the NDC includes plans for ecological sanitation projects, including the recovery and reuse of fecal sludge at 10 sites, particularly in cities most exposed to flooding.

Niger, NDC consulted: 2021

Niger's NDC document does not contain any specific measures concerning waste management, waste-to-energy, bio-waste or sanitation. However, it does mention that greenhouse gas emissions from the waste sector amount to 945.758 GgCO_2e, representing 2.29% of the country's total emissions. The main gases taken into account are CO_2, methane (CH_4) and nitrous oxide (N_2O). Wastewater treatment is mentioned in the management of water resources, but there is no explicit link with energy recovery or the reduction of methane emissions.

Senegal, NDC consulted: 2020

Senegal's NDC puts forward a strategy for the management and recovery of waste in order to reduce greenhouse gas emissions. The government has undertaken reforms (National Solid Waste Management Programme), including reorganisation of the sector, introduction of a regulatory framework, development of modern infrastructure and awareness-raising programmes. The aim is to reduce emissions from the waste sector by 10.99% to 11% unconditionally, and up to 65.28% with international support. Planned measures include improving the sewerage network to achieve 85% coverage by 2030, closing or rehabilitating illegal dumps, building waste management centres and implementing appropriate regulations. Energy recovery is based on the development of biogas with more than 48,000 biodigesters and the promotion of biochar to reduce dependence on fossil fuels. These initiatives aim to reduce the environmental footprint of waste, improve public health and promote the country's energy transition. However, their success depends largely on financial and technological support from the international community.
Waste sectors: Unconditional costs: USD 648m
Contingent costs USD 1,185m
Total: USD 1,834m/

Chad, NDC consulted: 2021

Chad produces around 88 kg of waste per capita per year, a rate that will remain stable until 2030. Currently, 86% of waste is sent to unmanaged open landfill sites, with the remainder burnt in the open air. Under these conditions, GHG emissions from the waste sector will rise from 326 kt CO_2e in 2018 to around 546 kt CO_2e in 2030, with average annual growth of 5%. Wastewater will generate 814 kt CO_2e in 2030, compared with 552 kt CO_2e in 2018. The installation of waste treatment plants in major cities could reduce these emissions by around 10%. The government plans to improve collection and treatment, in particular by recovering methane from controlled landfill sites and studying the composting of bio-waste. Urban sanitation is also mentioned as an issue, because of the impact of wastewater on water resources and public health.

LATIN AMERICA ZONE

Andes

Bolivia, NDC consulted: 2022

Bolivia is incorporating waste management into its climate strategy by focusing on improving solid waste treatment, developing recycling and composting, and reducing methane emissions from landfills. Waste-to-energy is not explicitly mentioned as a priority, although modernisation of the sector could include biogas projects. Wastewater management is also addressed, with the aim of achieving total sanitation coverage by 2030. The implementation of these commitments depends on international funding, the modernisation of infrastructure and the involvement of local authorities.

Colombia, NDC consulted: 2020

Colombia's NDC document contains detailed information on waste management and methane emissions, and includes Integrated Solid Waste Management (GIRS) as a strategic priority. Measures include the gradual introduction of mechanical-biological treatment (MBT) to reduce the organic fraction sent to landfill, the promotion of recycling (with a target of 15% by 2030), the capture and combustion of biogas from landfill sites (with a biogas treatment rate of 2% by 2030), and the energy recovery of biogas (in particular at the Doña Juana site, with an expected recovery of 0.6% of the biogas produced by 2030). The potential reduction in GHG emissions is estimated at 1.3 MtCO_2e by 2030.

Ecuador, NDC consulted: 2025

Ecuador's Second NDC focuses on comprehensive waste management to reduce GHG emissions, particularly methane from the decomposition of organic waste, which accounts for 54.9% of municipal solid waste. The waste sector contributes 5.43% of the country's total emissions, or 4,790.54 kt CO_2e in 2022. The strategies adopted include capturing methane in landfills, separating waste at source, recovering organic waste through composting and biomethanisation, and promoting the circular economy to reduce, reuse and recycle. The country also plans to improve the treatment and reuse of wastewater to limit pollution and reduce emissions. These actions will be implemented as part of the National Plan for the Integrated Management of Non-hazardous Solid Waste (PNGIRS) and will benefit from international financial support. Cross-cutting approaches, such as gender equality and intergenerational inclusion, are integrated into waste management policies to ensure sustainable and resilient development.

Peru, NDC consulted: 2021

Peru's NDC document makes no specific or detailed mention of actions concerning waste management. The waste sector is listed among those taken into account for greenhouse gas emissions (particularly methane), but there are no targeted sectoral measures.

Brazil, Southern Cone

Argentina, NDC consulted: 2021

Argentina presents its waste generation in its NDC, but has no specific ambition to reduce waste-related emissions. In 2019, Argentina generated around 49,300 tonnes of waste per day, with a high proportion of compostable material (over 40%), which favours the use of biological methods to reduce the volumes destined for final disposal. The proportion of plastics in waste has increased considerably since 1972, reaching between 15% and 20%, while paper and cardboard account for between 13% and 20%. The country aims to reduce waste production, promote the circular economy, improve source separation and strengthen the recycling industry. Energy recovery is encouraged, notably through the exploitation of industrial residues and the use of alternative fuels in industry. The management of bio-waste is based on composting and the improvement of infrastructures to reintegrate it into economic and environmental cycles. Although the reduction of methane emissions is not explicitly addressed, the reduction of landfill waste and the strengthening of waste management infrastructures should indirectly contribute to limiting these emissions.

Brazil, NDC consulted: 2024

Brazil aims to reduce methane emissions from the waste sector by capturing and recovering biogas from solid waste and wastewater, in particular through anaerobic digestion and advanced aerobic treatment. Waste management is aligned with national sanitation and solid waste management policies, with the aim of achieving integrated and sustainable management. The gradual elimination of open dumps is planned in favour of modern treatment infrastructures and wastewater treatment plants. The circular economy is encouraged by recycling, reusing and recovering energy from waste through combustion and the production of biofuels. These measures are part of a wider strategy of ecological transition and carbon neutrality by 2050.

Chile, NDC consulted: 2021

The document provides for the development of a National Organic Waste Strategy (2020) geared towards greater recovery of municipal bio-waste, with the aim of reintegrating nutrients and organic matter into the production cycle, thereby helping to both mitigate and adapt to climate change. Chile is also planning a roadmap towards a circular economy (2020-2040), incorporating waste management as a central lever. The emphasis is on the circularity of organic materials. As part of its carbon neutrality scenario, Chile expects 100% of urban household waste to be disposed of by 2035 in landfills using combustion or biogas systems, with biogas capture or recovery. New sewage sludge treatment plants are planned in Concepción and Valparaíso, with methane management and sludge recovery as forest biostabilisers. In agriculture, it is planned that the pig population will gradually be redirected towards biodigesters.

DRMCC

Costa Rica, NDC consulted: 2020

The Costa Rica NDC document includes concrete and ambitious actions regarding waste management. The country aims for an integrated waste management system based on waste reduction, reuse, recovery, treatment, and final disposal with minimal GHG emissions. It commits to achieving 50% coverage of sanitation and wastewater treatment in high-density areas by 2030. It plans to implement the National Composting Plan in at least 10 municipalities by 2025, as well as to launch the Solid Waste Integrated Management Action Plan 2021-2026, aligned with efforts to reduce emissions and promote a circular economy and bioeconomy. The country also emphasizes the recovery of biowaste through composting. Regarding methane, although this gas is not explicitly mentioned in the waste section, the biowaste treatment and recovery measures, along with improved wastewater management, indirectly contribute to reducing its emissions.

Cuba, NDC consulted: 2025

Cuba's NDC 3.0 document contains little specific information on waste management. It indicates that GHG emissions from the waste sector will account for around 14% of the country's total emissions in 2022, mainly due to the increase in solid waste going to uncategorised landfill sites. Cuba has identified the waste sector as a priority for reducing emissions, alongside energy and agriculture. One notable measure concerns the reduction of methane emissions through the anaerobic treatment of vinasse in 11 sugar cane distilleries, with the aim of reducing the potential for methane emissions by 50% by 2035.

Guatemala, NDC consulted: 2022

In its NDC 2021 (Update), Guatemala includes the waste sector among the areas for climate change mitigation. It mentions integrated solid waste management, including reduction at source, awareness-raising, waste separation, recycling, composting and improving existing landfills, but does not provide any further details. Capture of methane gas from landfills, with no mention of specific infrastructure such as methanisation or RDF units. With regard to wastewater treatment, wastewater is recognised as a source of methane emissions, and a quantified measure aims to reduce emissions linked to its treatment by 0.15 $MtCO_2e$ by 2030. The waste sector, including wastewater treatment, is estimated to contribute between 0.3 and 0.4 $MtCO_2e$/year of emission reductions by 2030.

Honduras, NDC consulted: 2021

The NDC document mentions "Gestión Integral de Residuos (GIR)" as a specific mitigation objective, aimed at promoting waste management at all levels (national to local) in conjunction with a circular economy, reducing health and environmental risks, and educating the population. Mention is also made of the "relleno sanitario de Tegucigalpa" (sanitary landfill) as a mitigation measure to reduce GHG emissions. Methane is included in the GHGs monitored, notably via emissions from the treatment of solid waste and wastewater, but without any in-depth details on the strategies for reducing these emissions. The document states that the overall reduction in GHG emissions of 16% compared with the BaU scenario is broken down by sector, with 1% attributed to the waste sector.

Mexico, NDC consulted: 2022

Mexico recognises that methane emissions from the waste sector are a significant source of greenhouse gases (GHGs), and is putting forward measures to improve the comprehensive management of municipal solid waste and the treatment of municipal and industrial wastewater. The country plans to optimise the processes of reuse, recycling, composting and biodigestion. It is also committed to capturing and using biogas from landfill sites and wastewater treatment plants. A transition to a circular economy is envisaged, including actions to improve the management of food waste and electronic waste, with a strong potential for reducing emissions through life-cycle analysis of materials.

Nicaragua, NDC consulted: 2020

The La Chureca project - to close and rehabilitate the country's largest landfill site - has led to the construction of a recycling plant, as well as houses and a school for the more than 250 families living on the site, and a reduction in emissions of gases produced by decomposing waste. These gases should be used to generate electricity by the Mayor of Managua.

Panama, NDC consulted: 2024

Panama's Second Nationally Determined Contribution (NDC2) directly addresses waste management issues under the circular economy pillar. The country outlines commitments to improve the integrated management of solid waste, promote energy recovery, incorporate biowaste, and reduce methane emissions. The NDC2 includes the implementation of the Basura Cero (Zero Waste) Policy, the development of infrastructure for composting, biowaste valorization, and the use of biogas as a renewable energy source. Emphasis is placed on reducing methane emissions from organic waste, and efforts are planned to integrate the waste sector into the Measurement, Reporting, and Verification (MRV) system. The plan also includes specific commitments for urban areas, such as the creation of waste management plans in targeted communities (e.g., Chilibre), contributing to watershed resilience. Methodologies are mentioned for estimating greenhouse gas emissions from waste, particularly CH_4 emissions.

Salvador, NDC consulted: 2022

El Salvador's NDC document explicitly mentions waste management and sanitation issues. The waste sector accounted for 9.2% of the country's GHG emissions in 2014. The NDC includes a specific section on "Saneamiento y Residuos Sólidos" as a priority adaptation sector. The objectives are to reduce health risks, improve sanitation services and ensure comprehensive solid waste management, in particular by modernising infrastructure and promoting recycling.

OCE ZONE

Atlantic Ocean

Haiti, NDC consulted: 2022

Haiti's NDC includes a number of measures relating to waste management and the reduction of methane emissions. The country plans to recycle plastics with a central capacity of 1,000 tonnes per year, produce fuels from municipal solid waste at a rate of 200 tonnes per day, and compost municipal solid waste with a central capacity of 1,000 tonnes per day. In terms of sanitation, Haiti plans to meticulously manage and treat wastewater by installing treatment plants. Methane emissions linked to waste and fugitive emissions are mentioned, but without any specific measures to capture or recover methane for energy purposes.

Dominican Republic, NDC consulted: 2020

The Dominican Republic's NDC deals succinctly with waste management. It identifies five mitigation options in the waste sector, but without sufficient data for a quantitative assessment. These options are: to develop a national strategy for organic waste in order to increase its recovery and reduce methane emissions; to capture and use methane from landfills for energy purposes; to recycle new waste to produce energy or compost; to introduce the circular economy into waste management with indicators for MRV (*Measurement, Reporting and Verification*); to use municipal, industrial and biological waste as fuel in cement works. Law 225-20 on the integrated management and co-treatment of solid waste is also mentioned as an enabling framework.

Indian Ocean

Comoros, NDC consulted: 2021

The treatment of waste, most of which is organic (food), has been identified as a sector that emits greenhouse gases, mainly methane. Two mitigation measures are planned for 2030: improving waste collection and developing biogas and compost, for an estimated reduction of 15 $ktCO_2e$, at a total cost of €22.4 million. These measures are conditional on international funding. Improving waste management, in particular by composting bio-waste, is also a priority in the short and medium term.

Madagascar, NDC consulted: 2024

Madagascar is aiming for a 51.4% reduction in GHG emissions in the waste sector by 2030, dropping from 2,083 Gg CO_2e to 1,072 Gg CO_2e. To achieve this target, the country plans to strengthen regulatory frameworks, integrate the waste value chain and promote waste standardisation. Initiatives will be put in place to improve the management of liquid effluents and promote the energy recovery of waste. The transfer of innovative technologies and the introduction of a reliable system for monitoring waste flows are also planned. Developing the circular economy, improving urban sanitation and protecting water resources are among the expected co-benefits. However, major challenges remain, in particular the need for substantial funding, estimated at USD 23.9 billion between now and 2030, of which only 3 to 4% will be covered by Madagascar. The success of the plan will also depend on institutional strengthening and the mobilisation of appropriate technologies.

Mauritius, NDC consulted: 2021

The NDC mentions waste management as a sector for reducing GHG emissions, with a reduction target of 313 $ktCO_2e$ by 2030. The plan calls for 70% of waste to be diverted from landfill through composting, sorting, anaerobic digestion (biogas) and waste-to-energy incineration. The use of anaerobic digestion is explicitly mentioned. Bio-waste is included in the composting and methanisation solutions, although not specifically mentioned. Agriculture will also benefit from small-scale biogas pilot units.

ORE ZONE

Central Asia

Kazakhstan, NDC consulted: 2021

Kazakhstan's NDC includes waste management and energy recovery in its climate commitments. The country aims to reduce GHG emissions from waste, particularly methane from landfill sites, by improving sorting, recycling and advanced treatment infrastructures. Waste-to-energy has been identified as a solution for replacing fossil fuels and reducing the country's carbon footprint. The government is planning incentives and a regulatory framework to encourage investment in the sector, with the aim of reducing landfill deposits and developing energy conversion facilities. Carbon taxation and green finance mechanisms will be mobilised to support these initiatives and accelerate the transition to a low-carbon economy.

Kyrgyzstan, NDC consulted: 2020

Kyrgyzstan's NDC provides for the introduction of separate waste collection and recycling systems, but does not quantify the emission reductions (not estimated). It also envisages the installation of biogas plants on landfills and sewage treatment plants from 2025, the methane reduction potential of which is accounted for in the energy sector. These measures are all part of the WAM scenario (with international support). Methane emissions from waste are mentioned indirectly via biogas, without specific details. Emissions from the waste sector rose by 26.92% between 1990 and 2017.

Uzbekistan, NDC consulted: 2021

Uzbekistan's NDC document does not explicitly mention detailed measures for waste management. However, it does include a reference to the waste sector, which accounted for 1.4% of the country's greenhouse gas emissions in 2017. The main emissions in this sector come from solid waste disposal and wastewater treatment. The document also mentions plans to improve household waste management as part of the country's environmental strategies.

Tajikistan, NDC consulted: 2021

Tajikistan's NDC mentions waste management as part of the improvement of industrial and municipal waste treatment infrastructures. It provides for the development of innovative technologies for recycling and the integration of waste into the circular economy. The introduction of waste monitoring systems is envisaged to improve waste management and optimise treatment processes. No specific information is provided on the recovery of energy from waste and bio-waste. The document takes account of methane emissions as part of the greenhouse gas inventory, but does not detail any specific measures for reducing methane emissions from waste.

Turkmenistan, NDC consulted: 2023

Turkmenistan has included waste management in its NDC as a priority sector for reducing greenhouse gas emissions, particularly methane from landfill sites. The country plans to optimise waste treatment by reducing the volumes landfilled and developing recycling. Energy recovery from waste involves producing biogas and setting up facilities to convert solid waste into energy. These initiatives are part of the national strategy for renewable energy and the fight against climate change. The regulatory framework has been strengthened by a law on waste and the inclusion of this sector in national climate policies. Public-private partnerships are being encouraged to finance the necessary infrastructure. By 2030, the country aims to reduce methane emissions by improving sorting, recycling and energy recovery, while increasing the share of renewable energy thanks to bioenergy from waste. The involvement of the private sector and NGOs is also encouraged to promote innovative solutions and raise awareness.
No figures on waste management.

South Asia

Afghanistan, NDC consulted: 2016

The sector is developed in the NDC in terms of technological needs and capacity building.

Bangladesh, NDC consulted: 2021

Bangladesh includes waste management in its NDC with targeted actions to reduce methane emissions from landfills and wastewater. In 2012, waste sector emissions were 24.11 $MtCO_2e$, representing 14.26% of total emissions, and are projected to reach 30.89 $MtCO_2e$ in 2030 without intervention. Unconditional actions call for a reduction of 0.6 $MtCO_2e$ by 2030 through improving municipal waste management, applying the 3Rs principle, installing a waste-to-energy unit in Dhaka, setting up incineration in one city and creating an integrated waste management centre. The conditional actions target a further reduction of 1.84 $MtCO_2e$ with the extension of incineration to three other cities, the construction of wastewater treatment facilities and the development of regional waste recovery centres. The estimated investment for these actions is USD 608 million for unconditional measures and USD 1.958 billion for conditional measures. The strategy is based on recovering energy from waste, reducing anaerobic landfill and integrating the circular economy, while requiring international financial and technological support for its full implementation.

Bhutan, NDC consulted: 2017

The NDC advocates minimising GHG emissions by applying the zero waste concept and sustainable waste management practices using the three Rs (Reduce, Reuse, Recycle), converting waste into resources and improving the current waste management system and infrastructure.

India, NDC consulted: 2022

Waste management is not explicitly mentioned in this version.

Nepal, NDC consulted: 2021

Nepal's NDC includes commitments to waste management and the reduction of methane emissions. By 2025, 380 million litres per day of wastewater will be treated before discharge, and 60,000 cubic metres of faecal sludge will be managed, thus reducing approximately 258 Gg CO_2e compared with the baseline scenario. By 2030, the country plans to create a favourable environment for the treatment of industrial and municipal waste, including faecal sludge, and to implement sorting, recycling and energy recovery programmes in at least 100 municipalities. Nepal will also ban the incineration of hospital waste in 1,400 health establishments by adopting alternative technologies. It emphasises the principles of the 3Rs (reduce, reuse, recycle) and the co-production of energy and organic fertilisers from solid waste, wastewater and faecal sludge.

Pakistan, NDC consulted: 2021

Pakistan, through its NDC 2021, is implementing several initiatives to improve waste management and limit methane emissions. The **Clean Green Pakistan Index** programme **(CGPI - 2019)** aims to strengthen municipal services, particularly solid waste management, sanitation and hygiene. A ban on single-use plastics has been introduced to reduce waste, while the use of **cow manure to produce methane** is being encouraged, notably with the Karachi Bus Rapid Transit (BRT) project, which supplies biogas to a public transport network. The waste sector accounted for **21.72 Mt CO_2e in 2018,** including **19.2 Mt CO_2e of methane,** mainly from **landfills, wastewater treatment and waste incineration.** Pakistan promotes better solid waste management through reduction, reuse and recycling, as well as energy production from bio-waste. A programme to reduce the burning of agricultural waste has also been introduced to limit pollution and methane emissions. Improving WASH infrastructure is a priority, with a national strategy aimed at strengthening sanitation and water management services in a context of climate resilience.

Sri Lanka, NDC consulted: 2021

Sri Lanka generates around 9,000 tonnes of municipal solid waste per day, 40% of which is generated in the Western Province. Collection remains inadequate, with a rate of 55% in this province and 25% elsewhere. The country aims to reduce waste production by 10%, improve sorting and collection to 75% coverage in the Western Province and 60% elsewhere, and increase recycling to 7% and 5% respectively. Bio-waste recovery is based on increasing composting to 30%, optimising wastewater treatment plants and developing biogas. The production of energy from waste is being encouraged by the installation of two waste-to-energy facilities and the development of new thermal treatment technologies. To reduce methane emissions, the transition to sanitary landfills and the rehabilitation of old landfills with gas recovery are planned. These measures should enable a reduction in GHG emissions of 11% by 2030, or 2.5 million tonnes of CO_2, 8.5% of which can be achieved without external aid and 2.5% conditional on international support. The major challenges involve financing infrastructure, tightening regulations on sorting and raising public awareness of more sustainable waste management.

Southeast Asia

Burma, NDC consulted: 2021

In the NDC, to mitigate GHG emissions, Myanmar proposes to produce energy and reduce pollution from non-recyclable waste and to put in place a national waste management strategy and action plans. In 2015, these were under development and were due to be completed in 2017.

Cambodia, NDC consulted: 2020

Cambodia's updated NDC document mentions actions to reduce GHG emissions in the waste sector, but does not provide details. The plan includes initiatives such as increasing sanitary landfill sites with landfill gas extraction, promoting composting of the organic fraction of municipal waste and producing refuse derived fuels (RDF). The aim is to capture and reduce methane emissions associated with municipal solid waste.

Indonesia, NDC consulted: 2022

Indonesia is committed to improving waste management and energy recovery to reduce greenhouse gas emissions. The objective is to reduce emissions from the waste sector by 40 $MtCO_2e$ in an unconditional scenario and up to 43.5 $MtCO_2e$ in a conditional scenario. The country is implementing waste reduction and recycling policies with Presidential Decree No. 97/2017, setting a national solid waste management strategy, and Decree No. 35/2018, aimed at accelerating waste-to-energy infrastructure. The focus is on optimising the treatment of solid and liquid industrial waste, in particular through composting, the reuse of sewage sludge and the capture of methane from industrial effluents. The development of biogas and biomethanisation technologies is a priority for exploiting methane emissions from landfill sites and wastewater treatment plants. By 2030, Indonesia is aiming for a significant reduction in methane emissions and an increase in the production of energy from waste, supported by a strengthening of infrastructure and institutional capacity.

Laos, NDC consulted: 2020

Laos' NDC 2020 document explicitly mentions the waste sector only as part of conditional mitigation measures. There are plans to implement a sustainable municipal solid waste management project (500 tonnes/day) in Vientiane, with an estimated reduction of 40 $ktCO_2e$/year between 2020 and 2030. Although the sector contributed less than 1% of GHG emissions in the base year, methane emissions associated with open waste incineration as well as the disposal of organic waste at sites without biogas capture systems are expected to continue to rise steadily with economic development. The project is in line with the Strategy and Action Plan for Sustainable Solid Waste Management in Vientiane (2020-2030), including bio-waste separation and recycling. There is no mention of energy recovery or specific treatment of bio-waste beyond separation. The aim is also to adopt a circular economy approach.

Philippines, NDC consulted: 2021

The Philippines has included waste management in its NDC, with a GHG emissions reduction target of 75% by 2030, of which 2.71% is unconditional and 72.29% conditional. The country is focusing on a circularity and sustainable consumption approach, using market mechanisms and technology transfer to improve waste management. Implementation relies on international funding and bilateral and multilateral partnerships.

Thailand, NDC consulted: 2022

Thailand's NDC mentions waste management as part of its plan to reduce GHG emissions, and in particular talks about its (2012-2031) Waste Management Roadmap without detailing its content. It includes the recovery of energy from waste through the promotion of waste-to-energy technologies (much emphasised) and the improvement of waste management systems at local level. The NDC states that negative public perception is a major obstacle to the acceptance and deployment of **waste-to-energy** facilities. The 3R approach (reduce, reuse, recycle) is also discussed.

Vietnam, NDC consulted: 2022

Vietnam's NDC includes measures for waste management and the reduction of methane emissions. The country plans to reduce the production of solid waste and encourage recycling using advanced technologies. It promotes the production of compost and refuse derived fuels (RDF), as well as the recovery and use of methane from landfills and anaerobic treatment for energy production. Efforts are being made to optimise the treatment of domestic and industrial wastewater by incorporating biotechnologies to limit methane emissions.

BALKANS AND EASTERN EU

Albania, NDC consulted:

The revised NDC says that emissions from the waste sector come mainly from landfills, particularly methane (CH_4), which accounted for around 80% of the sector's emissions in 2016. The country forecasts a modest reduction in these emissions of -0.7% by 2030 compared with the trend scenario. Incinerators have been built in Elbasan, Tirana and Fier (operational in 2023), but there is as yet no separate collection system, despite the legal obligation to do so. Mitigation actions include: reducing landfill of bio-waste to 35% of 2010 levels, methane capture from 2025 (10% of 1.34 million m^3 in 2030), increasing composting (+85% between 2009 and 2020, +3%/year thereafter), increasing incineration of household waste, reducing open burning, and limited improvements in wastewater treatment (urban and industrial).

Bosnia and Herzegovina, NDC consulted: 2021

There are no specific measures or actions related to waste management outlined in the Nationally Determined Contribution of Bosnia and Herzegovina.

Northern Macedonia, NDC consulted: 2020

Northern Macedonia is aiming for a 51% reduction in GHG emissions by 2030, with a specific target of 21% for the waste sector. To achieve this, it plans to improve solid waste management by increasing sorting and recycling and developing regional treatment centres. Energy recovery from waste is encouraged through the production of alternative fuels (SRF), biogas and the installation of thermal treatment units. The circular economy approach targets several waste streams, including construction, electronic and plastic waste, with an ambition to reduce emissions by 951 Gg CO_2e/year, create 2,740 jobs and generate €47.17 million in benefits. The country plans to strengthen infrastructure, attract private investment and integrate waste management into the energy transition to maximise environmental and economic gains.

Moldova, NDC consulted:

The waste sector is mentioned as accounting for 10% of national GHG emissions in 2016, but no details are provided on any measures, strategies or projects targeting this sector.

CHINA / MONGOLIA

China, NDC consulted: 2021

Waste management in China's NDC is dealt with transversally, without a dedicated section. The municipal solid waste sector is briefly mentioned, via an incineration-to-energy project in Tianjin.
On the other hand, the management of agricultural bio-waste is clearly detailed: recovery of manure, straw and methanization via rural biogas projects, notably in Sichuan, with quantified GHG reductions. These actions are helping to reduce agricultural methane emissions. China is also seeking to reduce methane emissions from agriculture by optimizing fertilizer use and promoting organic fertilization. The country supports the development of biomass as a renewable energy source, including the production of electricity from bio-waste.
The document also describes industrial circular economy policies, including battery recycling and materials recovery in industrial parks.

Finally, the NDC seems to show ambitions to reduce waste at source through the promotion of the shared economy (mobility, rental) and low-carbon lifestyle awareness campaigns.

Mongolia, NDC consulted: 2020

Mongolia's NDC document briefly mentions, in the mitigation measures section, an action aimed at reducing the volume of waste sent to landfill through improved treatment and recycling processes, as well as increasing the population's access to improved sanitation and hygiene facilities. These measures will reduce GHG emissions by an estimated 106.1 Gg CO_2e.

MIDDLE EAST

Iraq, NDC consulted: 2021

Iraq is incorporating waste management and energy recovery into its climate strategy. It plans to improve wastewater treatment for reuse in agriculture and industry, and to develop organic waste treatment plants to produce biogas and compost. Energy recovery is based on sorting, recycling and using solid waste to produce electricity and fuel, in particular by recovering methane from landfill sites. Iraq is seeking to establish a regulatory framework that encourages private investment and technological innovation to optimise waste management and reduce its environmental impact. However, it faces challenges including a lack of infrastructure, the need for international funding and the need to build local capacity. **The document does not provide precise figures on the quantities of waste produced, treated or recovered, but it sets out the broad guidelines and financial requirements,** estimated at 100 billion dollars for all its climate commitments between now and 2030. The implementation of these initiatives relies on international support and regional cooperation to achieve the climate objectives.

Jordan, NDC consulted: 2021

Jordan's updated NDC document states that the waste sector accounted for 6% of the country's total GHG emissions in 2012. Jordan adopted the Waste Management Framework Law No.º 16 of 2020, which introduces producer/polluter responsibility and aims for modern integrated management based on the 3R model (Reduce, Reuse, Recycle). The National Solid Waste Management Strategy (2015-2034) sets short-, medium- and long-term targets, including reducing the amount of bio-waste sent to landfill. Specific projects include the collection and use of biogas from landfills (Al-Dhulil, Al-Salt, Madaba) and sludge from wastewater treatment plants (Wadi Arab, Baqa'a, Ramtha, Salt). The aim is to generate electricity from the captured methane, thereby reducing emissions and the consumption of fossil fuels. Composting units for sorted bio-waste are also planned (total capacity of 200 t/day). These measures are part of the 32 actions to reduce emissions, with a target of -31% by 2030. Wastewater treatment is mentioned in terms of energy recovery from sludge, but there is no explicit overall plan for wastewater.

Lebanon NDC consulted: 2021

The waste sector is included in the overall objective of reducing greenhouse gas emissions, but no detailed plan or measure is presented on this subject.

Palestine, NDC consulted: 2021

The waste sector is the second largest contributor to greenhouse gas emissions (751.7 Gg CO_2e, or 23% of total emissions). Most emissions come from the treatment of industrial and domestic wastewater (66%). Solid waste accounts for 31% of the sector's emissions. Population growth is the main factor behind this upward trend in gas emissions in the energy and waste management sector. This is because it leads to an increase in emissive activities and therefore in the associated emissions.

TURKEY AND THE CAUCASUS

Azerbaijan, NDC consulted: 2023

2017 version
The NDC talks about developing solid waste management systems in the country's largest cities, without giving any further details.
Azerbaijan is aiming to reduce its greenhouse gas emissions by 40% by 2050, and is including waste management in its climate commitments. While emissions from most sectors have fallen, those from the waste sector have increased by 72% since 1990, accounting for around 2.2% of total emissions in 2016. This increase is mainly due to the poor management of solid waste and wastewater, resulting in significant methane emissions. To remedy this, Azerbaijan has adopted a National Strategy for the Improvement of Solid Waste Management (2018-2022) aimed at improving collection and treatment, attracting private investment and promoting recycling. The State is also seeking to develop waste-to-energy conversion using biogas and incineration with energy recovery in order to reduce dependence on landfills and limit methane emissions. A transition to a circular economy model is being encouraged, combining waste reduction, recycling and energy production from waste, while raising public awareness and implementing incentive policies.

Georgia, NDC consulted: 2021

Georgia's updated NDC deals very briefly with the waste sector. It provides for the low-carbon development of the sector through the promotion of innovative climate-friendly technologies, the adoption of sorting practices and the application of circular economy principles.

Turkey, NDC consulted: 2023

Turkey generated 32.3 million tonnes of municipal waste in 2020 and has invested in modernising its management, promoting the transition from dumps to controlled landfills. In 2021, 59.6% of the municipal waste collected was landfilled, with partial recovery of the biogas. By 2020, 303 kt of methane had been captured and prevented from being released into the atmosphere. Electricity generation from biogas and landfill gas is on the increase thanks to incentives, with 84 installations in 55 provinces, generating 4,096,452 MWh per year. The national Zero Waste project, initiated in 2017 and supported by the UN, aims to promote the circular economy and waste reduction. Turkey plans to increase the recovery rate of municipal waste to 60% by 2035, gradually reduce landfilling of waste without pre-treatment to reach zero landfilling by 2053, and increase the production of fuel derived from waste. It also aims to transform wastewater treatment plants into biorefineries and increase the reuse of wastewater. Its regulatory framework includes specific laws and regulations, including the national waste management plan (2016-2023) and a circular economy strategy currently being drawn up. These measures are part of its climate strategy to achieve carbon neutrality by 2053 by reducing GHG emissions and optimising the use of natural resources.