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Modeling Tomorrow: Innovation for Sustainable Development Innovation Systems, Technological Capabilities, and Sustainability Transitions in Latin America and the Caribbean



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Modeling Tomorrow: Innovation for Sustainable Development

Innovation Systems, Technological Capabilities, and Sustainability Transitions in Latin America and the Caribbean

CHAPTER III.

Governing Sustainability Transitions

Modelling an Integrated Waste-to-Energy PPP for Jamaica

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1. Introduction

Jamaica's municipal solid-waste system presents a linked development challenge. The country generates approximately 1.5 million tonnes of solid waste each year, but disposal continues to depend heavily on open dumps rather than fully engineered sanitary landfills. The Riverton City and Retirement legacy disposal sites, located in St. Andrew and St. James, respectively, have long outlived their design lives and experience recurrent fires, smoke and odour. Together with collection constraints, low levels of separation and recycling, and the absence of a modern residue-management system, these conditions impose environmental, health and productivity costs. The 2022 national waste-characterisation study also found that organics account for about 39.7% of the municipal waste stream, followed by plastics, cardboard, paper and other materials (Development Bank of Jamaica [DBJ], 2022). The Auditor General's Department (2022) separately identified persistent weaknesses in the regulation, coordination, collection and disposal functions of the National Solid Waste Management Authority (NSWMA).

Waste-to-energy (WtE) is therefore relevant to Jamaica, but only if treated as part of a wider reform encompassing collection, transfer, materials recovery, energy recovery from residual waste and final disposal. A stand-alone power-plant procurement would leave the underlying waste-system failures unresolved and could create new fiscal, environmental and feedstock risks. Electricity planning also imposes a demanding test. Jamaica's updated Integrated Resource Plan (IRP) retains WtE among the candidate resources but assigned it no capacity in the preferred portfolio, describing it as not competitive on the available power-sector data and calling for better technical and economic information before future consideration (Ministry of Science, Energy, Telecommunications and Transport [MSETT], 2024).

This article asks three questions. First, what WtE configuration is technically realistic and compatible with Jamaica's waste hierarchy and electricity system? Second, under what commercial and financial conditions could a representative 65 megawatt (MW) integrated WtE public-private partnership (PPP) reach financial close and achieve robust debt-service coverage by Operating Year 4? Third, what legal, regulatory, environmental, social and PPP-design measures would be required to implement it responsibly? The contribution is an integrated decision framework for a small island developing state. The framework connects waste composition and plant scale to project-finance performance, regulatory sequencing and public-interest safeguards. The following sections review the relevant literature, explain the methodology, present the results and draw out their implications for sustainable development.

2. Literature Review

Integrated solid-waste management and circular-economy research places prevention, reuse and recycling ahead of energy recovery and final disposal. OECD (2019) reviews show that effective circular-economy systems combine clear institutional responsibilities, reliable data, economic instruments, infrastructure finance and markets for recovered materials. In that framework, WtE

is not a substitute for waste reduction or recycling. Brunner and Morf (2025) nevertheless argue that modern WtE can perform a residual-waste and final-sink function when it destroys hazardous organic substances, recovers energy and metals, and operates with stringent pollution control. The relevance of that argument to Jamaica depends on whether the facility is sized for the residual stream after feasible diversion rather than being protected from future recycling gains.

The economic literature is more guarded. Dijkgraaf and Vollebergh (2004) demonstrate that comparisons between incineration and landfilling are highly sensitive to private costs, energy recovery and the valuation of environmental externalities, and Tait et al. (2025) similarly find that outcomes vary with capital and operating costs, waste composition, emissions controls and community acceptance.

According to PPP best practice, risks should be assigned to the party best able to control or absorb them. The Global Infrastructure Hub's WtE guidance identifies planning, construction, technology, waste quantity and quality, electricity offtake, payment, environmental and change-in-law risks as central to contract design (Global Infrastructure Hub, 2020). Private partners can ordinarily manage engineering, construction and operational performance, while government is often better placed to manage legal reform, public approvals, waste-flow enforcement and the credit quality of public payment obligations. In small island settings these standard categories intersect with scale, hurricane exposure, limited disposal alternatives, foreign-exchange volatility and constrained regulatory capacity.

Island experience narrows these general findings. Singapore operates large-scale incineration as core waste-management infrastructure rather than as a stand-alone power project: controlled delivery, storage bunkers large enough to smooth fluctuations in supply, bunker air management to contain odour, and continuous emissions monitoring that sustains regulatory credibility (National Environment Agency, 2026). The H-POWER facility on O'ahu illustrates a second pathway, in which energy recovery is financed and governed as a waste-disposal necessity with an electricity co-benefit; pairing dependable waste delivery with a firm offtake insulates the project from the two risks that compound in small systems, merchant price volatility and variable waste flows (Hawaiian Electric, n.d.). Mauritius supplies the cautionary case. The proposed incinerator at La Chaumiere attracted sustained public mobilisation and legal challenge in 2009, centred on dioxin exposure and on a waste stream with high organic content. It did not proceed, and the country instead advanced landfill-gas recovery at Mare Chicose, a less contested route that builds institutional capacity while wider reforms mature (Ackbarally, 2009).

These cases also mark the limits of transferability. Much of the Northern European business case for WtE rests on selling heat into district-heating networks and, in some jurisdictions, on importing waste to keep plants fully utilised (Nordic Council of Ministers, 2024). This business model would not be applicable or feasible for Jamaica. However, lessons can be learned from the institutional package, comprising enforceable flow control, collection performance, credible emissions regulation and enforcement, and a settled downstream solution for ash and residues. In addition to technical compliance, social legitimacy must also be considered. Community concerns about siting, traffic, local air quality and unequal exposure can determine whether approvals remain durable (Tait et al., 2025), and Jamaica's experience at Riverton City and Retirement makes transparent monitoring and enforceable remedies especially important.

3. Methodology

The study uses a mixed-methods, decision-oriented assessment designed to support policy and investment choices. The evidence base combines Jamaican waste and electricity data, project-finance modelling, legal and institutional review, and international benchmarks. Waste quantities and composition are drawn principally from the 2022 national characterisation study and public reports on the operation of the waste system. Power-sector assumptions are tested against the Integrated Resource Plan, while the approvals analysis reviews the National Solid Waste Management Act, environmental impact assessment (EIA) requirements, generation licensing, procurement and PPP processes (Auditor General's Department, 2022; DBJ, 2022; MSETT, 2024; National Environment and Planning Agency [NEPA], 2007).

The technical model begins with annual waste tonnage and a range of lower heating values. It estimates the thermal input required by a 65 MW plant and adjusts output for availability, internal electricity use and conversion efficiency. This provides an order-of-magnitude test of feasible plant scale and shows how collection performance, organics diversion and waste quality affect energy yield. Moving-grate mass-burn technology is assessed as the reference option for mixed residual municipal solid waste because it has a substantial operating record and can tolerate more heterogeneous feedstock than less mature thermal alternatives. Anaerobic digestion, landfill-gas capture and specialised pilots are assessed as complements for distinct waste fractions.

The financial model is a five-year operating and cash-flow model in United States dollars, supported by a longer project-life valuation. It incorporates total funding requirements, operating costs, working capital, maintenance, debt service and four potential revenue streams: power sales, gate fees, metals recovery and modest renewable-certificate income. The representative debt package comprises US$330 million in two tranches, one senior commercial and one concessional, with a 20-year tenor, interest-only treatment in Year 1 and level annual debt service thereafter. The model calculates cash flow available for debt service (CFADS), debt-service coverage ratios (DSCRs), project and equity internal rates of return (IRRs), and net present values (NPVs). Sensitivity tests vary the power tariff, gate fee, plant utilisation, throughput and capital cost.

A parallel institutional review maps the environmental, planning, generation-licensing, procurement, PPP and contractual steps that must converge at financial close. Critical-path reasoning identifies approvals that can delay the whole transaction, while international risk-allocation guidance and European best-available-technique conclusions provide comparators for contract and emissions-control design (European Commission, 2019; Global Infrastructure Hub, 2020). The results remain indicative. Waste composition, site conditions, bidder prices, exchange and interest rates, tax treatment, procurement outcomes and the final environmental assessment can materially change the case. The model should therefore be refreshed before tender, after environmental studies, at preferred-bidder stage and before financial close.

4. Analysis of Results

4.1 Technical configuration and system fit

The analysis supports a central 65 MW moving-grate facility as a plausible anchor asset, but not as the whole waste strategy. The design basis is approximately 850,000 tonnes per year,

consistent with the integrated solid-waste public-private partnership under preparation by the DBJ (DBJ, n.d.). The operating model is more conservative during ramp-up: throughput reaches approximately 762,000 tonnes in Year 4 and 807,000 tonnes in Year 5. At an 85% capacity factor, Year-4 net output is approximately 484 gigawatt-hours, equivalent to roughly a tenth of national electricity demand. This is dispatchable electricity, but only the portion attributable to the biogenic fraction of the waste stream should be classified as renewable.

The anchor plant is viable only as part of a multi-asset system. Required supporting investments include transfer stations and improved collection routes, grid interconnection, industrial water and wastewater systems, an engineered landfill for residual waste, and a secure ash monofill. These are operational necessities. Delivery should also be phased. Collection and transfer first, the central hub and engineered landfill second, and any western satellite only once waste-flow data justify it. Combustion may leave approximately 15–25% of input mass as bottom ash, air-pollution-control residues and other material requiring recovery, treatment or secure disposal (U.S. Environmental Protection Agency [EPA], 2026).

The 39.7% organic share creates both opportunity and risk. Wet organics lower effective calorific value and can reduce combustion efficiency. Separate collection and anaerobic digestion are better suited to food waste from markets, hotels, institutions and agro-processing, while landfill-gas capture can address methane from legacy cells. Materials recovery should remove recyclable metals and other viable fractions before or after combustion. Gasification and refuse-derived-fuel pilots should proceed only with demonstrably consistent feedstock and credible offtakers. This portfolio approach preserves the waste hierarchy and reduces the risk that a long-term minimum-tonnage commitment will crowd out future recycling. Sizing should be aligned with the plastics ban, the deposit-refund scheme and the expansion of Recycling Partners of Jamaica, so that capacity reflects realistic post-diversion tonnages.

4.2 Financeability and risk allocation

Table 1 distinguishes project-level capital cost from total funding uses, and lender coverage from equity attractiveness. Lenders and investors ask different questions of the same cash flows: whether debts can always be paid, and whether what remains rewards the risk. Total project and engineering capital is approximately US$632 million. Debt fees and a six-month debt-service reserve increase total uses to approximately US$657.2 million. The model assumes US$330 million in debt and US$327.2 million in equity.

Table 1. Indicative pre-tax financeability results for the integrated 65 MW WtE project

Metric	Indicative result	Interpretation
Total funding uses	US$657.2m	US$632.0m project cost, US$9.9m debt fees and US$15.3m debt-service reserve
Funding structure	US$330.0m debt; US$327.2m equity	Debt and equity are approximately balanced
Year-4 operations	Revenue US$131.81m; operating expenditure (OPEX) US$49.91m	Operating performance strengthens after ramp-up
Year-4 debt service	CFADS US$73.80m; debt service US$30.59m	Substantial lender headroom in the base case
DSCR pathway	0.91 / 1.04 / 2.41 / 2.76	Years 2–5; early years require distribution controls and liquidity protection
Project return	IRR 10.84%; NPV US$132.29m	Exceeds the modelled 9% project discount rate
Equity return	IRR 12.67%; NPV -US$43.11m	Below the modelled 14% equity hurdle

Source: Author's calculations based on the project-finance assumptions described in Section 3.

The results support a precise conclusion. The model reaches strong steady-state debt-service coverage by Year 4, when CFADS of US$73.8 million covers annual debt service of US$30.59 million 2.41 times. Bankability at financial close nevertheless depends on fully funding or restructuring the ramp-up shortfalls. In Operating Year 1, CFADS of US$5.03 million falls below interest-only debt service of US$22.25 million, and the six-month debt-service reserve of US$15.29 million would not fully cover the resulting gap. DSCR is also 0.91 in Year 2 and only 1.04 in Year 3. The financing structure therefore requires interest capitalisation, a larger liquidity reserve, sponsor support or more strongly sculpted debt. Once strong coverage is achieved, it is reasonably durable: single-variable tariff, gate-fee or operating stresses reduce Year-4 DSCR to 2.14–2.26, still well above the modelled 1.20 minimum threshold. The fragility lies in funding the ramp-up years.

However, the investor case must be assessed separately. The pre-tax project return exceeds the modelled 9% project discount rate, but the base-case equity return of 12.67% remains below the 14% equity hurdle. Because the base case already assumes a concessional tranche, the residual gap must be closed by a modestly stronger revenue floor, a longer tenor, deeper concessionality or a carefully calibrated blend, without transferring excessive risk to taxpayers or waste-service users.

The adjustments required are modest. An additional US$0.005 per kilowatt-hour from Operating Year 4 is worth approximately US$2.4 million a year at 484 gigawatt-hours, and an additional US$3 per tonne on the gate fee approximately US$2.3 million a year at 762,000 tonnes. Either lever, or a light blend of the two alongside a longer tenor or deeper concessionality, lifts equity returns towards the hurdle while leaving Year-4 coverage above 1.8 times. The Inter-American Development Bank has already supported studies and plans for the PPP business case through a US$800,000 technical-cooperation operation (Inter-American Development Bank, 2020). The remaining questions are: who pays the increment, and on what evidence of value for money.

The viable revenue package has four components: electricity sales under a long-term power purchase agreement (PPA), an indexed gate fee, metals recovery, and limited renewable-certificate or carbon income. The model's indicative Year-4 terms are a blended power price of about US$0.18 per kilowatt-hour, a gate fee of about US$50 per tonne in 2025 dollars and metals revenue of about US$8 per tonne. Carbon income should remain outside the base case. Article 6 transfers require host-country authorisation, robust monitoring, corresponding adjustments and reporting, while voluntary markets add price and eligibility uncertainty (United Nations Framework Convention on Climate Change [UNFCCC], 2025).

Revenue levels alone are insufficient. Enforceable flow control, a guaranteed minimum tonnage mechanism, one clearly identified public waste-payment counterparty, certified weighing, quality rules, gate-fee indexation and payment security are necessary to make the cash flows bankable. Construction and performance risk should sit with the private party under fixed-price, date-certain and performance-backed arrangements. Government should retain only those risks it can manage more efficiently, including legal reform, public approvals and enforcement. The contract suite must also allocate foreign-exchange, interest-rate, force-majeure and hurricane-resilience risks explicitly and provide for the funded closure, remediation and long-term aftercare of legacy disposal sites. Gate-fee commitments, guarantees and shortfall payments must be costed, disclosed and controlled as contingent fiscal liabilities.

4.2 Regulatory, environmental and social conditions

The power-sector constraint is binding. The IRP assigned zero capacity to WtE in the preferred portfolio because the available option was not competitive, and it noted that the data were insufficiently comprehensive for candidate modelling (MSETT, 2024). A candidate listing is therefore not a capacity award, and a WtE transaction should not bypass least-cost planning. Updated waste, cost and performance data must be submitted for power-system assessment, and any capacity award and power purchase agreement with the Jamaica Public Service Company (JPS) must be secured through the competitive process administered by the Generation Procurement Entity under the oversight of the Office of Utilities Regulation (OUR). If broader waste-management benefits are used to justify public support, those benefits and costs should be appraised transparently rather than embedded opaquely in the electricity tariff.

Financial close also requires closure of Jamaica's core solid-waste regulatory gaps. The Auditor General reported that regulations on disposal facilities and public cleansing had remained under development for years (Auditor General's Department, 2022). Updated regulations should set enforceable licensing and operating standards for WtE plants, sanitary landfills and ash monofills; establish waste-flow, weighing, separation and exclusive-delivery rules; and specify inspection, reporting, closure and enforcement powers. The institutional settlement must also identify a single contracting authority and clarify NSWMA's regulatory, contract-monitoring and enforcement functions where service delivery is concessioned. These measures are conditions of bankability because lenders cannot rely on contractual promises where facility standards, waste control and public accountability remain legally uncertain.

Environmental approval by NEPA is a genuine decision gate. A full environmental-impact assessment must examine site alternatives, airshed and health effects, truck traffic, climate hazards, ash management and cumulative burdens. Siting is not settled. Haddon in St Ann, a parcel of government-owned land near the Highway 2000 North-South corridor, has been under feasibility assessment for expansion, and neighbouring communities have already raised concerns about smoke and nuisance, so its suitability cannot be presumed in advance of the assessment (Jackson, 2023; Radio Jamaica News, 2023). A weak or highly qualified result should trigger redesign, resizing, relocation or a shift to alternatives rather than an attempt to force the project through. Any permitted plant would require continuous emissions monitoring, public reporting, independent verification and emissions controls benchmarked explicitly against European Union best-available-technique standards for large municipal waste combustors, with any divergence deliberate and publicly justified (European Commission, 2019; NEPA, 2007).

Social licence is equally material to long-term performance. Communities affected by legacy dumps require early access to understandable information, meaningful influence over sitting and traffic decisions, a grievance mechanism with response standards, and public access to operating and emissions data. Transition arrangements are also required for informal waste pickers and others whose livelihoods may be displaced by dump closure and system formalisation. These obligations should be integrated into procurement and contract management.

Institutionally, Jamaica should manage the project through a single critical path. A dedicated inter-agency task force, drawing in the NSWMA, NEPA, the DBJ, the Generation Procurement Entity, the OUR and the affected municipal corporations, should coordinate approvals,

generation licensing, PPP appraisal, procurement, land, grid interconnection, the PPA, the waste-supply agreement and residue responsibilities. The immediate enabling work is to refresh the waste baseline, complete site and logistics studies, define enforceable flow control, cost fiscal exposure and prepare the principal contracts in parallel. Financial close should occur only when the environmental permit, generation licence, land rights, interconnection terms, construction wrap and payment-security package are mutually consistent.

4.3 Sustainable-development and innovation implications

The principal innovation is institutional and systemic. An integrated WtE programme would connect waste data, collection logistics, materials recovery, pollution monitoring, power procurement and long-term PPP management. Building those capabilities could improve municipal service performance and create demand for local engineering, environmental services, digital monitoring, maintenance, logistics and circular-economy enterprises. It could also reduce disruptions and health losses associated with dump fires, recover metals and energy from residual waste, and reduce methane from unmanaged disposal.

Capability building should begin during project preparation. Procurement documents should require operator training, apprenticeships and a progressive localisation plan, developed with Jamaica's Human Employment and Resource Training / National Service Training Agency Trust, University of the West Indies, University of Technology and other relevant technical institutions, so that international technology transfer produces a durable Jamaican workforce in plant operations, maintenance, emissions monitoring, logistics and environmental management.

These outcomes align with the Sustainable Development Goals on energy, decent work, infrastructure, sustainable cities, responsible production and climate action. The alignment is nevertheless conditional. A plant that weakens recycling, transfers unpriced liabilities to government, fails emissions tests or burdens already affected communities would not constitute sustainable innovation. The development case therefore depends on measurable service improvements, a credible residual-waste strategy, transparent fiscal treatment, local capability building and public accountability throughout the concession.

5. Concluding Remarks

Jamaica has a credible case for advancing an integrated WtE option to the next stage of appraisal. A 65 MW moving-grate facility could serve as the anchor of an integrated system combining modern collection and transfer, organics diversion, materials recovery, engineered landfill capacity and energy recovery. The technical model supports a design in the order of 850,000 tonnes per year and approximately 484 gigawatt-hours of net Year-4 electricity output, subject to feedstock quality and operating performance. Only the biogenic share should be counted as renewable.

The financial findings are equally conditional. Year-4 lender coverage is strong under the assumed tariff, gate fee, throughput and cost structure, but early-year DSCR is tight and the base-case equity return is below the assumed hurdle. Bankability therefore requires a coherent package of indexed revenues, waste-supply certainty, payment security, effective risk allocation and appropriately structured or blended finance. Public support should be given only where a transparent value-for-money and affordability assessment shows that system-wide benefits justify the exposure.

The appropriate next step is a sequenced decision process. This involves establishing the inter-agency task force; refreshing waste and cost data; testing the project against current electricity planning; completing site, logistics and environmental studies; preparing the principal contracts together; and quantifying all direct and contingent fiscal commitments before tender. If the waste baseline, EIA, electricity-system test or affordability assessment does not support the proposed scale, Jamaica should resize, relocate or defer the plant and intensify sanitary-landfill, anaerobic-digestion, recycling and landfill-gas alternatives. Under that structured approach, WtE can be evaluated as a governed investment in sustainable-development capability.

6. References

Ackbarally, N. (2009, July 15). *Environment-Mauritius: Hold your fire*. Global Issues. https://www.globalissues.org/news/2009/07/15/2194

Auditor General's Department. (2022). *Performance audit – Management of solid waste: National Solid Waste Management Authority*. https://auditorgeneral.gov.jm/wp-content/uploads/2022/07/Performance-Audit-Report-NSWMA-July-25-2022-FINAL.pdf

Brunner, P. H., & Morf, L. S. (2025). Waste to energy, indispensable cornerstone for circular economy: A mini-review. *Waste Management & Research, 43*(1), 26–38. https://doi.org/10.1177/0734242X241227376

Development Bank of Jamaica. (2022). *National solid waste characterization study*. https://dbankjm.com/wp-content/uploads/2020/06/2022-06-Waste-characterization-Results-website-v2-1.pdf

Development Bank of Jamaica. (n.d.). *Integrated solid waste management PPP*. https://dbankjm.com/waste-management-reform-programme/

Dijkgraaf, E., & Vollebergh, H. R. J. (2004). Burn or bury? A social cost comparison of final waste disposal methods. *Ecological Economics, 50*(3–4), 233–247. https://doi.org/10.1016/j.ecolecon.2004.03.029

European Commission. (2019). Commission Implementing Decision (EU) 2019/2010 of 12 November 2019 establishing the best available techniques conclusions for waste incineration. *Official Journal of the European Union, L 312*, 55–91. https://eur-lex.europa.eu/eli/dec_impl/2019/2010/oj/eng

Global Infrastructure Hub. (2020). *PPP Risk Allocation Tool 2019 Edition: Water and waste*. https://www.gihub.org/resources/publications/ppp-risk-allocation-tool-2019-edition/

Hawaiian Electric. (n.d.). *H-POWER (Covanta Honolulu Resource Recovery Venture)*. https://www.hawaiianelectric.com/clean-energy-hawaii/our-clean-energy-portfolio/renewable-energy-sources/biomass/h-power

Inter-American Development Bank. (2020). *Support for improvement of solid waste management* (Project No. JA-T1182). https://www.iadb.org/en/project/JA-T1182

Jackson, S. (2023, October 4). Waste-to-energy plant under consideration for St Ann landfill. *The Gleaner*. https://jamaica-gleaner.com/article/business/20231004/waste-energy-plant-under-consideration-st-ann-landfill

Ministry of Science, Energy, Telecommunications and Transport. (2024). *2022 Jamaica Integrated Resource Plan: 2018 IRP review and update*. https://www.mset.gov.jm/wp-content/uploads/2024/11/2022-Jamaica-Integrated-Resource-Plan.pdf

National Environment Agency. (2026, April 14). *Waste-to-energy incineration plants*. https://www.nea.gov.sg/our-services/waste-management/waste-management-infrastructure/semakau-landfill/waste-to-energy-and-incineration-plants

National Environment and Planning Agency. (2007). *Guidelines for conducting environmental impact assessments and public presentations*. https://www.nepa.gov.jm/sites/default/files/2019-12/EIA-Guidelines-and-Public-presentation-2007.pdf

Nordic Council of Ministers. (2024). *Waste incineration in the Nordic countries: A status assessment with regard to emissions and recycling* (TemaNord 2024:524). https://doi.org/10.6027/temanord2024-524

OECD. (2019). *Waste management and the circular economy in selected OECD countries: Evidence from environmental performance reviews*. OECD Publishing. https://doi.org/10.1787/9789264309395-en

Radio Jamaica News. (2023, September 20). *Councillor-caretaker wants relocation of Haddon dump amid spate of fires*. https://radiojamaicanewsonline.com/local/councillor-caretaker-wants-relocation-of-haddon-dump-amid-spate-of-fires

Tait, P. W., Salmona, J., Sandhu, M., Guscott, T., King, J., & Williamson, V. (2025). Economic, environmental, and sociopolitical aspects of waste incineration: A scoping review. *Sustainability, 17*(12), 5528. https://doi.org/10.3390/su17125528

U.S. Environmental Protection Agency. (2026). *Energy recovery from the combustion of municipal solid waste (MSW)*. https://www.epa.gov/smm/energy-recovery-combustion-municipal-solid-waste-msw

United Nations Framework Convention on Climate Change. (2025). *Article 6.2 reference manual for the accounting, reporting and review of cooperative approaches* (Version 3). https://unfccc.int/documents/634354