Nigeria Emission Factor Database (NEFDB) Methodology

Abstract

The Nigeria Emission Factor Database (NEFDB) is an open, versioned compilation of emission factors designed to support corporate greenhouse gas accounting for Nigerian organizations and their value chains. Version 1.0.2, referred to as NEFDB v1, presents Scope 1 and Scope 2 emission factors for grid electricity, stationary fuel combustion, road transport, domestic aviation, waste disposal and treatment, and water supply and wastewater treatment. Factors integrate internationally recognized guidance, including the Intergovernmental Panel on Climate Change Guidelines for National Greenhouse Gas Inventories and the GHG Protocol Corporate Standard, with Nigeria-specific data such as Nigerian Electricity Regulatory Commission generation statistics, National Bureau of Statistics electricity data, and Lagos wastewater measurements. Where local data are unavailable, transparent proxies are adopted and flagged with explicit uncertainty bands. Each source document is archived in the public source-document archive, and derived factors are published as CSV and JSON data files. This paper describes the data sources, derivation methods, quality-assurance workflow, and limitations of NEFDB v1.

1. Introduction

Corporate greenhouse gas reporting in Nigeria has historically relied on emission factors drawn from European, North American, or global default sources. These proxies can misstate Nigerian emissions because they assume grid mixes, vehicle fleets, fuel specifications, waste practices, and treatment efficiencies that differ from local conditions. A Nigeria-specific factor set reduces this bias and improves comparability across reports filed with the Nigerian Exchange Group, the Financial Reporting Council of Nigeria, and the Securities and Exchange Commission Nigeria.

NEFDB v1 is intended for sustainability professionals, corporate carbon accountants, auditors, researchers, and regulators. The database aligns with the GHG Protocol Corporate Standard (World Resources Institute & World Business Council for Sustainable Development, 2015a) and the GHG Protocol Scope 2 Guidance (World Resources Institute & World Business Council for Sustainable Development, 2015b). Factors are organized into six domains: grid electricity, fuel combustion, road transport, aviation, waste, and water treatment. Each factor carries a confidence rating and an uncertainty percentage so that users can judge fitness for purpose.

2. Data and Methodology Overview

The workflow used to build NEFDB v1 comprises four steps: source identification and appraisal, factor derivation, quality assurance, and publication.

Source identification and appraisal. Primary sources are authoritative documents from Nigerian government agencies, international bodies, and peer-reviewed literature. Each source is catalogued in a source inventory and, where redistribution is permitted, archived in the public source-document archive. Cross-check sources are retained to corroborate values and record data gaps.

Factor derivation. Emission factors are calculated from the source data using the methods documented in the following sections. Calculations favor simple, transparent formulas that can be reproduced from the archived inputs. All factors are expressed in metric units (kgCO2e per litre, kWh, kilometre, passenger-kilometre, tonne, cubic metre, or kilogram of chemical oxygen demand) and use the AR5 global warming potential values of 28 for methane and 265 for nitrous oxide unless otherwise noted.

Quality assurance. Each factor is checked for unit consistency, arithmetic correctness, and inventory coverage. Primary and corroborating source identifiers are validated against the source inventory. Factor values are exported to the published CSV and JSON data files, and the two files are compared for consistency.

Publication. Version 1.0.2 is released through GitHub https://github.com/palmgrove/nefdb. The published data files contain the final factor values. Source documents remain available through a public source-document archive https://nefdb-r2-publisher.ugbodagadavid.workers.dev/ so that third parties can reproduce or audit the derivation chain.

3. Grid Electricity

3.1 National grid margin factors

NEFDB v1 includes three national grid margin factors taken from the standardized baseline for the West African Power Pool including Nigeria (UNFCCC & West African Power Pool, 2021b). The baseline reports operating margin, build margin, and combined margin values for the WAPP grid, of which Nigeria is a member country. The baseline is corroborated by the associated assessment report (UNFCCC & West African Power Pool, 2021a). All three values are published in tonnes CO2 per megawatt-hour, which convert one-to-one to kilograms CO2e per kilowatt-hour because both the mass and energy units differ by a factor of one thousand.

The operating margin represents average emissions from existing dispatchable generation. The build margin represents recent capacity additions. The combined margin is a weighted combination used for project-level calculations. For wind and solar projects in the first crediting period, the UNFCCC CDM Methodological Tool 07 prescribes weights of 0.75 on the operating margin and 0.25 on the build margin (UNFCCC, 2021):

$CM = 0.75 \times OM + 0.25 \times BM$ where CM is the combined margin, OM is the operating margin, and BM is the build margin.

Applying the formula to the WAPP values gives 0.75 × 0.578 + 0.25 × 0.556 = 0.573 $kgCO_2e/kWh$, matching the published combined margin (UNFCCC & West African Power Pool, 2021b). The margin factors are reported as carbon dioxide only, so they do not depend on the global warming potential basis.

3.2 National location-based factor for 2024

The national location-based grid factor is derived from the NEFDB reconciled 2024 Nigerian generation mix (Nigeria Emission Factor Database, 2024), anchored to the Nigerian Electricity Regulatory Commission total generation and hydro share as reported by Guardian Nigeria (Guardian Nigeria & Nigerian Electricity Regulatory Commission, 2024) and cross-checked against Ember and Our World in Data electricity statistics (Ember & Our World in Data, 2024).

The reconciled mix for 2024 is:

Fuel	Generation (GWh)
Gas	25,433.85
Oil	0.00
Hydro	11,469.85
Solar	130.00
Biomass	60.00
Other	0.00
Total	37,093.70

The location-based emission factor is a generation-weighted average:

`EF_grid = sum(G_i × EF_i) / sum(G_i)` where G_i is generation from fuel i

and EF_i is the fuel-specific emission factor.

Fuel-specific emission factors are computed from Intergovernmental Panel on Climate Change (2006a) default emission factors for stationary combustion. For natural gas, the default values are 56,100 kg CO_2 per terajoule, 1 kg CH_4 per terajoule, and 0.1 kg N_2O per terajoule. Converting to a per-kilowatt-hour basis with 3.6 megajoules per kilowatt-hour and the AR5 global warming potentials gives:

```
EF_gas = (56,100 + 1 × 28 + 0.1 × 265) × 3.6 / 10^6
       = 0.202156 kgCO2e/kWh
```

For residual fuel oil, the defaults are 77,400 kg CO_2 per terajoule, 3 kg CH_4 per terajoule, and 0.6 kg N_2O per terajoule, yielding:

```
EF_oil = (77,400 + 3 × 28 + 0.6 × 265) × 3.6 / 10^6
       = 0.279515 kgCO2e/kWh
```

Hydro, solar, wind, biomass, and other generation are treated as zero-emission. Because oil generation in 2024 is zero, the national factor is driven entirely by gas-fired generation:

```
EF_grid = (25,433.85 × 0.202156 + 0 × 0.279515) / 37,093.70
        = 0.138611 kgCO2e/kWh
```

3.3 Distribution-company-level factors

Eleven distribution-company-level factors are derived from National Bureau of Statistics (2024) Q2 2024 billed energy data, the 2024 Nigerian generation mix (Nigerian Electricity Regulatory Commission & Nigeria Emission Factor Database, 2024), and the Intergovernmental Panel on Climate Change (2006a) stationary combustion defaults.

The 2024 national generation mix is anchored to 68.57 percent gas, 30.92 percent hydro, and 0.51 percent other. A territorial adjustment is applied because dispatch is not publicly available at the distribution-company level:

- Northern distribution companies (AEDC, JEDC, KDEDC, KEDC, YEDC): gas share reduced by 10 percentage points, hydro share increased by 10 percentage points.
- Western and central distribution companies (BEDC, IBEDC, IEDC): gas share increased by 2 percentage points, hydro share reduced by 2 percentage points.
- Southern distribution companies (EEDC, EKEDC, PEDC): gas share increased by 12 percentage points, hydro share reduced by 12 percentage points.

For each distribution company, the location-based factor is:

`EF_Disco = gas_pct × EF_gas` where gas_pct is the adjusted gas share and hydro and other shares contribute zero emissions. The resulting factors are shown in Table 1.

Table 1: Distribution-company location-based grid emission factors for 2024

Distribution company	Gas share (%)	Emission factor (kgCO2e/kWh)	Confidence	Uncertainty (%)
AEDC	58.57	0.118396	Medium	20
BEDC	70.57	0.142655	Medium	20
EEDC	80.57	0.162870	Medium	20
EKEDC	80.57	0.162870	Medium	20
IBEDC	70.57	0.142655	Medium	20
IEDC	70.57	0.142655	Medium	20
JEDC	58.57	0.118396	Medium	20
KDEDC	58.57	0.118396	Medium	20
KEDC	58.57	0.118396	Medium	20
PEDC	80.57	0.162870	Medium	20
YEDC	58.57	0.118396	Medium	20

4. Fuel Combustion

4.1 Stationary combustion factors

Stationary combustion factors for diesel, petrol, liquefied petroleum gas, compressed natural gas, natural gas, and heavy fuel oil are taken primarily from the UK DESNZ/DEFRA 2024 greenhouse gas conversion factors (U.K. Department for Energy Security and Net Zero, 2024). Each value is cross-checked against the Intergovernmental Panel on Climate Change (2006a) stationary combustion defaults and the U.S. Environmental Protection Agency (2024) emission factors hub. Differences among the three reference sets are typically within one to three percent for liquid fuels.

The adopted values are shown in Table 2.

Table 2: Stationary combustion emission factors

Fuel	Emission factor	Unit	Confidence	Uncertainty (%)
Diesel	2.662	kgCO2e/litre	High	10
Petrol	2.354	kgCO2e/litre	High	10
LPG	1.557	kgCO2e/litre	High	10
CNG	2.568	kgCO2e/kg	Medium	15
Natural gas	2.045	kgCO2e/m3	High	10
Heavy fuel oil	3.175	kgCO2e/litre	Medium	15

The natural gas factor assumes a grid-gas density consistent with the UK conversion factor set. Nigerian gas composition may differ, particularly in the wetness and heating value of associated gas from different fields (Nigerian National Petroleum Corporation, 2023), so the compressed natural gas and natural gas factors are flagged with medium confidence. Cubic-metre values for compressed natural gas require a density assumption; the per-kilogram value is therefore preferred.

4.2 Diesel electricity-generation factors

Two per-kilowatt-hour factors for diesel-powered electricity generation are derived from the stationary diesel factor by applying generator efficiency. The conversion is:

```
EF_kWh = EF_litre / (kWh_thermal_per_litre × efficiency)
```

where EF_litre is the stationary diesel factor in kgCO2e per litre, kWh_thermal_per_litre is 9.927 kilowatt-hours of thermal energy per litre, and efficiency is the electrical conversion efficiency expressed as a decimal. A rated-efficiency variant uses 33 percent, representative of modern generator sets:

```
EF_rated = 2.662 / (9.927 × 0.33) = 0.813 kgCO2e/kWh
```

A field-efficiency variant uses 28 percent, reflecting the lower efficiency typical of older, poorly maintained on-site generator sets common in Nigeria (Somorin et al., 2017):

```
EF_field = 2.662 / (9.927 × 0.28) = 0.958 kgCO2e/kWh
```

The field-efficiency value is the recommended default for Nigerian self-generated electricity inventories.

5. Road Transport

5.1 Fuel-based factors

The primary road-transport factors are fuel-based. Fuel purchase or consumption records are generally more reliable than vehiclekilometre estimates in Nigerian corporate settings. Petrol and diesel factors match the stationary combustion values because the underlying emission factors for fully combusted mineral petrol and diesel are the same whether the fuel is burned in a stationary engine or a vehicle. The values are corroborated against the Intergovernmental Panel on Climate Change (2006b) mobile combustion defaults (Table 3).

Table 3: Road-transport fuel-based emission factors

Fuel	Emission factor	Unit	Confidence	Uncertainty (%)
Petrol	2.354	kgCO2e/litre	High	10
Diesel	2.662	kgCO2e/litre	High	10

5.2 Distance-based factors

When only distance travelled is available, NEFDB v1 provides distance-based proxies derived from the UK DESNZ/DEFRA 2024 factors (U.K. Department for Energy Security and Net Zero, 2024). These are proxies because Nigeria-specific vehicle-kilometre, fuel-economy, and testcycle data are not available in public sources. The World Bank (2013) Nigeria low-carbon development study provides annual-kilometre defaults that users may apply to vehicle-stock data, but those defaults are not used to derive the per-kilometre factors.

The adopted distance-based factors are shown in Table 4.

Table 4: Road-transport distance-based emission factors

Vehicle class	Fuel	Emission factor	Unit	Confidence	Uncertainty (%)
Passenger car	Petrol	0.165	kgCO2e/km	Medium	20
Passenger car	Diesel	0.170	kgCO2e/km	Medium	20
Motorcycle	Petrol	0.114	kgCO2e/km	Low	30
Urban bus	Diesel	3.254	kgCO2e/km	Low	35
Light truck or van	Diesel	0.250	kgCO2e/km	Medium	20
Heavy goods vehicle	Diesel	0.873	kgCO2e/km	Medium	20

The bus factor is converted from a passenger-kilometre factor to a vehicle-kilometre factor using an assumed occupancy of 30 passengers:

```
EF_vehicle_km = EF_passenger_km × occupancy
              = 0.10846 × 30
              = 3.254 kgCO2e/km
```

This conversion is sensitive to actual occupancy, so the bus factor is flagged with low confidence (International Council on Clean Transportation, 2019).

6. Aviation

Domestic aviation factors are derived from the International Civil Aviation Organization (2023) Carbon Emissions Calculator Methodology, version 13.1. The Nigerian Civil Aviation Authority (2023) 2022 executive summary provides national passenger and flight totals for context but does not publish aircraft-type, load-factor, or route-specific fuel-burn data.

For each route, great-circle distance is computed from airport coordinates and increased by 9 percent to obtain the flown stage length, following the ICAO standard uplift. A single representative aircraft is used because Nigerian domestic routes are served by a mixed narrowbody fleet and detailed fleet composition by route is unavailable. The representative aircraft is a Boeing 737-500 with 114 seats, at a 72 percent load factor. The Intra-Africa passenger-to-cargo factor of 0.8432 from the methodology is applied to attribute total flight emissions to passengers.

The per-passenger-kilometre factor is:

```
EF_route = fuel_kg × 3.16 × 0.8432 / (seats × load_factor × stage_length_km)
```

where fuel_kg is interpolated from the ICAO fuel-consumption coefficients for the Boeing 737-500 at the route stage length, 3.16 is the kilograms of CO2 per kilogram of jet fuel, 0.8432 is the passenger-to-cargo factor, seats is 114, load_factor is 0.72, and stage_length_km is the uplifted great-circle distance in kilometres.

The resulting route-specific and generic factors are shown in Table 5. The generic factor is the arithmetic mean of the four route factors and is intended for use when the exact route is unknown.

Table 5: Domestic aviation emission factors

Route	Emission factor	Unit	Confidence	Uncertainty (%)

Lagos - Abuja	0.1962	kgCO2e/passenger-km	Medium	20
Lagos - Port Harcourt	0.2168	kgCO2e/passenger-km	Medium	20
Lagos - Kano	0.1489	kgCO2e/passenger-km	Medium	20
Abuja - Port Harcourt	0.2143	kgCO2e/passenger-km	Medium	20
Nigeria domestic average	0.1940	kgCO2e/passenger-km	Medium	20

An optional radiative-forcing multiplier of 1.9 is provided to account for non-CO2 climate effects such as contrails and cirrus cloud formation (Lee et al., 2021). The multiplier is not applied in the base factors. When used, the calculation is: `EF_with_RF = EF_route × 1.9`

7. Waste

7.1 Solid waste disposal

Municipal solid waste disposal factors are calculated using the Intergovernmental Panel on Climate Change (2006c) Tier 1 first-order decay model. Nigeria does not publish a national municipal solid waste composition table, so the Lagos metropolis mean composition is used as the best-available urban proxy. The degradable organic carbon fraction is:

```
DOC = sum(frac_j × DOC_j)
```

where frac_j is the wet-mass fraction of waste component j and DOC_j is the degradable organic carbon fraction for that component. Using the Lagos composition gives DOC = 0.15024 kg carbon per kilogram of wet waste.

For managed landfills, the parameters are: DOCf = 0.5, F = 0.5, oxidation factor OX = 0.1, and methane correction factor MCF = 1.0. The methane emission factor is:

```
EF_CH4 = DOC × DOCf × F × (16/12) × (1 - OX) × MCF × 1000
       = 0.15024 × 0.5 × 0.5 × 1.3333 × 0.9 × 1.0 × 1000
       = 45.07 kg CH4 / tonne
```

Converting to CO2e with a methane global warming potential of 28 gives:

```
EF_CO2e = 45.07 × 28 = 1,260 kgCO2e/tonne
```

For unmanaged open dumps, the oxidation factor is zero and the methane correction factor is 0.4:

```
EF_CH4 = 0.15024 × 0.5 × 0.5 × 1.3333 × 1.0 × 0.4 × 1000
       = 20.03 kg CH4 / tonne

EF_CO2e = 20.03 × 28 = 561 kgCO2e/tonne
```

7.2 Open burning

Open burning of municipal solid waste uses the Intergovernmental Panel on Climate Change (2006e) default emission factors for unmanaged burning. Biogenic CO2 is excluded; only fossil CO2 is included. The default values are 33 kg CO2 per tonne, 6.5 kg CH4 per tonne, and 0.2 kg N2O per tonne (Nigeria Open Burning Factsheet, 2021). The CO2e factor is:

```
EF_CO2e = 33 + (6.5 × 28) + (0.2 × 265)
        = 268 kgCO2e/tonne
```

7.3 Composting

The composting factor applies the Intergovernmental Panel on Climate Change (2006d) default wet-weight methane and nitrous oxide emission factors for aerobic composting: 4 kg CH4 per tonne and 0.24 kg N2O per tonne. Biogenic CO2 is excluded.

```
EF_CO2e = (4 × 28) + (0.24 × 265)
        = 176 kgCO2e/tonne
```

7.4 Domestic wastewater

Domestic wastewater methane emissions are estimated with the Intergovernmental Panel on Climate Change (2006f) Tier 1 model:

```
EF_CH4 = Bo × MCF
```

where Bo is the maximum methane-producing capacity and MCF is the methane correction factor. The default Bo is 0.6 kg CH4 per kilogram of biochemical oxygen demand. A national weighted MCF of 0.354 is inferred from the Federal Republic of Nigeria (2021) national inventory report by dividing reported 2017 methane emissions by total organically degradable material.

The per-cubic-metre factor uses an influent biochemical oxygen demand of 0.1275 kg per cubic metre from the Oke-Afa wastewater treatment plant characterisation study (Lagos State Wastewater Management Office & Nigeria Emission Factor Database, 2021):

```
EF_CO2e = Bo × MCF × BOD × 28
        = 0.6 × 0.354 × 0.1275 × 28
= 0.758 kgCO2e/m3
```

Nitrous oxide from domestic wastewater is not included because it depends on protein intake and is not captured in the available national data.

7.5 Industrial wastewater

Industrial wastewater uses the Intergovernmental Panel on Climate Change (2006f) chemical-oxygen-demand-based default. A conservative methane correction factor of 0.3 is applied to reflect overloaded aerobic or partial anaerobic treatment. The default Bo is 0.25 kg CH4 per kilogram of chemical oxygen demand:

```
EF_CH4 = Bo × MCF = 0.25 × 0.3 = 0.0750 kg CH4/kg COD

EF_CO2e = 0.0750 × 28 = 2.10 kgCO2e/kg COD
```

8. Water Treatment

Water supply and wastewater treatment services are treated as Scope 2 electricity factors. Local electricity-intensity data for Nigerian waterworks were not available, so UK DESNZ/DEFRA 2024 factors are used as proxies for electricity intensity and then converted to the Nigerian grid (U.K. Department for Energy Security and Net Zero, 2024; Nigeria Emission Factor Database, 2024).

For water supply:

```
Intensity = 0.15311 / 0.20705 = 0.739 kWh/m3
EF_CO2e = 0.739 × 0.138611 = 0.103 kgCO2e/m3
```

For wastewater treatment:

```
Intensity = 0.18574 / 0.20705 = 0.897 kWh/m3
EF_CO2e = 0.897 × 0.138611 = 0.124 kgCO2e/m3
```

9. Results

NEFDB v1 contains 45 emission factors across the six domains. Table 6 summarizes the final values, units, scopes, confidence levels, and uncertainty percentages.

Table 6: Summary of NEFDB v1 emission factors

Domain	Factor description	Value	Unit	Scope	Confidence	Uncertainty (%)
Grid electricity	National operating margin	0.578	kgCO2e/kWh	2	High	10
Grid electricity	National build margin	0.556	kgCO2e/kWh	2	High	10
Grid electricity	National combined margin	0.573	kgCO2e/kWh	2	High	10
Grid electricity	National location-based 2024	0.138611	kgCO2e/kWh	2	Medium	15
Grid electricity	Distribution-company factors	0.118396 to 0.162870	kgCO2e/kWh	2	Medium	20
Fuel combustion	Diesel stationary	2.662	kgCO2e/litre	1	High	10
Fuel combustion	Diesel electricity, rated efficiency	0.813	kgCO2e/kWh	1	Medium	15
Fuel combustion	Diesel electricity, field efficiency	0.958	kgCO2e/kWh	1	Medium	18
Fuel combustion	Petrol stationary	2.354	kgCO2e/litre	1	High	10
Fuel combustion	LPG stationary	1.557	kgCO2e/litre	1	High	10
Fuel combustion	CNG stationary	2.568	kgCO2e/kg	1	Medium	15
Fuel combustion	Natural gas stationary	2.045	kgCO2e/m3	1	High	10
Fuel combustion	Heavy fuel oil stationary	3.175	kgCO2e/litre	1	Medium	15
Road transport	Petrol per litre	2.354	kgCO2e/litre	1	High	10
Road transport	Diesel per litre	2.662	kgCO2e/litre	1	High	10
Road transport	Petrol car per km	0.165	kgCO2e/km	1	Medium	20

Road transport	Diesel car per km	0.170	kgCO2e/km	1	Medium	20
Road transport	Petrol motorcycle per km	0.114	kgCO2e/km	1	Low	30
Road transport	Diesel bus per km	3.254	kgCO2e/km	1	Low	35
Road transport	Small diesel truck per km	0.250	kgCO2e/km	1	Medium	20
Road transport	Heavy diesel truck per km	0.873	kgCO2e/km	1	Medium	20
Aviation	Lagos - Abuja route	0.1962	kgCO2e/passenger-km	1	Medium	20
Aviation	Lagos - Port Harcourt route	0.2168	kgCO2e/passenger-km	1	Medium	20
Aviation	Lagos - Kano route	0.1489	kgCO2e/passenger-km	1	Medium	20
Aviation	Abuja - Port Harcourt route	0.2143	kgCO2e/passenger-km	1	Medium	20
Aviation	Generic domestic route	0.1940	kgCO2e/passenger-km	1	Medium	20
Aviation	Radiative-forcing multiplier	1.9	dimensionless	1	Medium	30
Waste	Managed landfill	1,260	kgCO2e/tonne	1	High	20
Waste	Open dump	561	kgCO2e/tonne	1	Medium	25
Waste	Open burning	268	kgCO2e/tonne	1	Medium	35
Waste	Composting	176	kgCO2e/tonne	1	High	25
Waste	Domestic wastewater	0.758	kgCO2e/m3	1	Medium	30
Waste	Industrial wastewater	2.10	kgCO2e/kg COD	1	Low	40
Water	Water supply	0.103	kgCO2e/m3	2	Medium	30
Water	Wastewater treatment	0.124	kgCO2e/m3	2	Medium	30

10. Limitations and Uncertainty

Several limitations affect the interpretability of NEFDB v1 factors.

Grid electricity. The 2024 national generation total and hydro share are sourced through a Guardian Nigeria summary of Nigerian Electricity Regulatory Commission data (Guardian Nigeria & Nigerian Electricity Regulatory Commission, 2024) because the official annual report was not available at the time of writing. Oil, solar, biomass, and other generation are small shares treated as zero-emission. Transmission and distribution losses are excluded, so the factors should be applied to generation or billed-energy denominators consistently. Upstream fugitive methane from natural gas production and transportation is also excluded.

Fuel combustion. The compressed natural gas and natural gas factors assume a UK gas density. Nigerian gas composition may differ, particularly in the wetness and heating value of associated gas from different fields.

Road transport and water treatment. Distance-based road factors and both water-treatment factors rely on UK proxies because Nigeriaspecific vehicle fuel-economy, vehicle-kilometre, and waterworks electricity-intensity data are not publicly available. The bus factor is highly sensitive to the assumed 30-passenger occupancy.

Aviation. The route factors depend on a single representative aircraft, the Boeing 737-500, and an assumed 72 percent load factor. Actual Nigerian domestic operations use a mix of aircraft types and load factors that vary by route and season. The radiative-forcing multiplier is metric- and time-horizon-dependent and is provided only as an optional adjustment.

Waste. There is no national municipal solid waste composition table for Nigeria. The managed-landfill, open-dump, and open-burning factors therefore use the Lagos metropolis mean composition as a proxy. The domestic wastewater factor is based on a single Lagos treatment plant for influent biochemical oxygen demand, and industrial wastewater uses a conservative default methane correction factor because sector-level treatment data are unavailable.

11. Conclusion

NEFDB v1 provides a transparent, Nigeria-focused set of Scope 1 and Scope 2 emission factors for the most common corporate reporting categories. By combining international guidance with Nigeria-specific data and clearly documenting proxies and uncertainty, the database offers a practical starting point for Nigerian Exchange Group, Financial Reporting Council of Nigeria, and Securities and Exchange Commission Nigeria reporting, as well as for corporate carbon accounting and research. As new Nigerian energy, transport, waste, and water data become available, the factors can be updated while preserving the documented audit trail in the source inventory, the published data files, and the public source-document archive.

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