CERT

Certified Emissions Reduction Technologies Foundation

EMISSIONS FROM ELECTRICITY CONSUMPTION AND GENERATION

CERT Methodological Tool · Version 1.0

Document ID: CERT-TOOL-003
Version 1.0
Date: 2 July 2026
Classification: Public

Document Control

Field	Detail
Document ID	CERT-TOOL-003
Title	CERT Emissions from Electricity Consumption and Generation
Version	1.0
Status	Approved
Owner	Standards Committee
Approver	Standards Committee
Review cycle	At least every five years
Related documents	CERT-REG-001; CERT-TOOL-004; CERT-MTH-001

Version History

Version	Date	Author	Description
1.0	2026-07-02	CERT Founding Secretariat	Initial draft for founding Board review and public consultation.

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1. Summary Description

This tool provides procedures to calculate baseline, project and leakage emissions from electricity consumption, and to account for activities that displace baseline electricity generation, in projects under the CERT Standard. It covers four supply scenarios: (A) grid electricity systems; (B) purpose-built wheeling arrangements; (C) shared power plants (localised grids and hybrid systems); and (D) dedicated power plants (off-grid and back-up). It is used where required by the applied CERT methodology; methodologies may apply parts of this tool or specify their own procedures.

2. Sources

This tool draws on internationally recognised electricity-accounting practice, including concepts from UNFCCC Clean Development Mechanism tools for baseline, project and leakage emissions from electricity consumption, adapted to the CERT Standard. It uses the current version of CERT-TOOL-004 Electricity System Emission Factors for grid emission factors.

3. Definitions

Term	Definition
Load	An electricity consumption or generation activity, categorised as baseline, project, or leakage.
Purpose-built wheeling arrangement (PBWA)	A contractual arrangement under which electricity from a specified generation facility is wheeled through the grid to a specified consumer, with time-stamped settlement.
Shared power plant	A plant supplying two or more consumers through a localised grid or hybrid system, not forming part of the regional/national grid.
Dedicated power plant	A plant supplying a single consumer, off-grid or as back-up.
TDL	Average technical transmission and distribution losses between the generation source and the load (dimensionless).

4. Applicability Conditions

4.1 This tool applies where the applied CERT methodology requires it. Categorise every electrical load within the assessment as baseline, project, or leakage before applying the scenario procedures.

4.2 Multiple activities may be treated as one load only where they share the same categorisation, the same supply connection, and common measurement or estimation.

5. Procedures

5.1 Scenario A: Grid Electricity System

For each grid-connected load L (including exports to the grid treated as a baseline-generation-displacement load):

$$BE_A = \Sigma L\ [\ EC_{BE,A,L} \times EF_{BE,A,L} \times (1 + TDL_{BE,A,L})\ ] \quad (1)$$

$$PE_A = \Sigma L\ [\ EC_{PE,A,L} \times EF_{PE,A,L} \times (1 + TDL_{PE,A,L})\ ] \quad (2)$$

$$LE_A = \Sigma L\ [\ EC_{LE,A,L} \times EF_{LE,A,L} \times (1 + TDL_{LE,A,L})\ ] \quad (3)$$

Where:

EC…,A,L = Electricity consumed (or displaced generation) for load L in the baseline, project, or leakage (MWh)

EF…,A,L = Emission factor for load L under Scenario A, determined using CERT-TOOL-004 (t CO2e/MWh)

TDL…,A,L = Average transmission and distribution losses applicable to load L (dimensionless); TDL = 0 for generation-displacement loads at the interconnection point

5.1.1 Where a project load is partly supplied under a PBWA (Scenario B), subtract the PBWA-settled quantity from grid consumption before applying Equation (2), so that no energy is double-counted between Scenarios A and B.

5.2 Scenario B: Purpose-Built Wheeling Arrangements

$$PE_B = EC_{PE,B} \times EF_{PE,B} \times (1 + TDL_{PE,B}) \quad (4)$$

5.2.1 EC_PE,B is the electricity settled under the PBWA within each settlement interval; quantities consumed in excess of contemporaneous PBWA generation are treated as grid consumption under Scenario A. Settlement must be hourly, or the shortest interval available from the settlement system, applied consistently.

5.2.2 EF_PE,B is the emission factor of the contracted generation facility: zero for renewable facilities without combustion emissions; otherwise calculated from the facility's fuel use per the applied methodology. Contractual exclusivity must be evidenced: attributes sold under the PBWA must not be claimed elsewhere (Rulebook 11).

5.3 Scenario C: Shared Power Plants

5.3.1 For each shared plant n serving the load, determine electricity delivered to each consumer from settlement or metering records, allocating losses pro rata.

$$PE_C = \Sigma n\ [\ EC_{PE,SPP,n} \times EF_{PE,SPP,n} \times (1 + TDL_{PE,SPP,n})\ ] \quad (5)$$

5.3.2 EF for a shared plant is the generation-weighted average emission factor of the plant(s) supplying the localised grid or hybrid system, calculated from monitored fuel consumption and net generation; where the shared system is also grid-connected, the grid-supplied share uses the Scenario A factor from CERT-TOOL-004.

5.4 Scenario D: Dedicated Power Plants

5.4.1 For a dedicated fossil-fuelled plant, calculate emissions from monitored fuel consumption and IPCC default emission factors, allocated to the load. For dedicated renewable plants without combustion emissions, the emission factor is zero.

5.4.2 Back-up plants: where a back-up dedicated plant serves a project load, monitor its generation and fuel use separately; conservative defaults specified by the methodology apply where separate monitoring is infeasible.

5.5 Conservativeness Rules

- For project and leakage consumption, use emission factor options that do not understate emissions; for baseline consumption and displaced generation, use options that do not overstate emissions (see CERT-TOOL-004 option pairs).
- Where TDL data are unavailable, use 0 for baseline/displacement loads and the highest documented national value for project/leakage loads.
- Data gaps are filled conservatively: highest plausible consumption for project loads; lowest plausible for baseline loads.

6. Data and Parameters

Parameter	Unit	Description / source	Monitoring
EC (all loads)	MWh	Electricity consumed or generated per load; metered	Continuous metering, monthly reading; calibration per national standards; digital MRV feed where available
EF grid	t CO2e/MWh	Per CERT-TOOL-004	Vintage per CERT-TOOL-004
TDL	—	National/utility published loss factors, most recent available at validation	Fixed ex ante; updated at crediting period renewal
Fuel consumption (Scenarios C/D)	mass or volume	Metered or from purchase records reconciled with stock	Monthly

References

- CERT Registry Rulebook (CERT-REG-001); CERT-TOOL-004 Electricity System Emission Factors; applied CERT methodology.
- UNFCCC CDM electricity-consumption tools (conceptual antecedents); IPCC Guidelines for National Greenhouse Gas Inventories (fuel emission factors).