Cascale

HIGG FEM 2026

FEM 2026 Energy Source Changes

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A summary of the changes in the in-assessment energy, emissions, water and waste calculations between FEM 2025 and FEM 2026.

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Summary

FEM 2026 changes one set of constants behind the in-assessment energy and emissions calculations: the country grid emission factors, which take the annual update from the IEA and, for the first time, count the non-CO2 gases of electricity generation. Every energy density, fuel emission factor and refrigerant global warming potential is carried over from FEM 2025 unchanged, and the MJ and kg CO2e calculation logic is the same. Energy values are therefore directly comparable between FEM 2025 and FEM 2026; emissions from purchased electricity (and from chilled water and unknown-source renewables, which use the same factor) move with the grid factor of the facility's country, as they do at every annual update.

1. **Country grid emission factors are updated** to the IEA Emission Factors 2026 edition. Each country takes its most recent year in the edition, 2024 or provisional 2025 where the IEA has published it, the same approach FEM 2025 took with 2022 and provisional 2023 data from the 2024 edition. Nothing upstream of the generator and nothing lost in transmission is included: the FEM's boundary is the facility's scope 1 and 2. *The data update reflects the changing nature of national grids and does not by itself impact comparability between FEM 2026 and earlier editions*. The specific values may not be shared under IEA's licensing terms; the Impact section below summarises the change in relative terms.
2. **The grid factor becomes a CO2e.** FEM 2025 and earlier priced purchased electricity with the IEA's CO2 figure alone. From FEM 2026 the factor also includes the CH4 and N2O emitted by the same generation, using the IPCC AR6 global warming potentials the IEA publishes them with (CH4 = 27, N2O = 273), so that the electricity figure is a CO2e like every fuel factor in the model already is. *This is a small methodology change*: across the countries where FEMs are filed the non-CO2 gases add 0.5% to grid-electricity emissions on a consumption-weighted basis (China, Vietnam and India each about 0.5%, Bangladesh 0.2%, Turkey 0.5%), and no country with regular FEM activity exceeds 3% (Guatemala 2.8%, El Salvador 2.3%, the United Kingdom 1.6%, Portugal 1.4%, Thailand 1.1%). That is smaller than the movement the CO2 figure already makes from one year to the next in these grids (a typical year moves it by 4%, and by more than 1% in nearly every country and year) and smaller than the revisions the IEA itself makes to a past year between two editions (typically 2%). *The change does not materially affect comparability between FEM 2026 and earlier editions: no rebaselining or restatement of earlier years is needed, and no data consumer will be able to separate it from ordinary grid drift in any country where FEMs are common.* The IEA's estimates for its supplementary countries carry CO2 only, so their factors are unchanged in this respect.
3. **Fuel emission factors and energy densities are identical** to FEM 2025 for every source, including the sub-sources selectable in the steam, purchased renewables, EAC and biomass mix tables.
4. **Refrigerants** are the same 127 refrigerants with the same IPCC AR6 global warming potentials.
5. **Calculation model:** identical. The changes below add a reporting unit and validation or applicability helpers; none alters the value of any existing total for the same answers.

Impact

Grid Emission Factors

Across the 250 countries and territories a facility can report, and including the 0.5% that the non-CO2 gases add, the **median change in the grid emission factor between FEM 2025 and FEM 2026 is a decrease of 4%**, and the average change is a decrease of 6% once the sixteen small grids that move by more than a factor of three are set aside. 150 factors fall and 100 rise. For the countries where most FEMs are filed the change is modest: the table below gives it in relative terms.

Country	Change	Country	Change
China	-9%	Italy	-16%
Vietnam	+12%	Portugal	-18%

Country	Change	Country	Change
Bangladesh	+2%	Mexico	+5%
India	-5%	Egypt	+2%
Indonesia	+2%	Morocco	-7%
Turkey	-4%	Guatemala	+67%
Cambodia	-10%	Honduras	+17%
Pakistan	-3%	El Salvador	+26%
Sri Lanka	+1%	Jordan	+28%
Taiwan, China	-9%	Kenya	-14%
Korea, South	-5%	Brazil	+24%
Thailand	-5%	Peru	-21%
Philippines	+13%	Colombia	-27%
United States	-1%	Germany	-9%
Japan	-1%	United Kingdom	-16%

The larger movements in Central America, Brazil, Jordan and Oman follow the IEA's reported generation mix for 2024, a year of drought-driven thermal generation in several hydro-dependent systems. Guatemala, Zimbabwe and Oman have the largest increases among grids with regular FEM activity; Costa Rica, Uruguay, Cameroon and Paraguay the largest decreases, all of them grids that returned to near-zero fossil generation.

Two things changed in how countries are matched to the IEA data:

- **Forty-three small countries and territories now take their own IEA figure** rather than a neighbouring country's. The 2026 edition adds estimates for some fifty "supplementary" countries built from United Nations Statistics Division energy balances (small island states and least-developed countries such as Fiji, the Maldives, Malawi, Guinea and the Bahamas). These carry CO2 only, with no CH4 or N2O, and several move a long way from the neighbour that stood in for them before; none of them hosts more than a handful of FEMs.
- **Five grids are deliberately priced at a neighbour's factor** even though the IEA publishes one for them, because most of their consumption is imported and the domestic-generation figure would misstate what facilities there use: Albania and Nepal (all-hydro generation reported as zero, heavy imports from fossil-heavy neighbours: priced at North Macedonia and India, as in FEM 2025), the West Bank and Gaza Strip (nearly all consumption imported from the Israeli grid; the IEA series falls to near zero in 2024 as local generation collapsed: priced at Israel), and Lesotho (about half imported from South Africa; the IEA estimate for its domestic hydro alone would price an apparel hub on coal power at nearly zero: priced at South Africa, the conservative choice, and up sharply from the FEM 2025 value, which was carried from an unrelated grid). Territories with no IEA row at all (Guam, Réunion, the Channel Islands and the like) keep the neighbour or administering country they used before.

The residual-mix factors used by the market-based method of the Higg Assessment Model (European AIB members only) are carried over from FEM 2025 unchanged and will be refreshed when the matching AIB year is published.

The Higg Assessment Model records price purchased electricity differently from the in-assessment figures described here: every cadence's records use the latest licensed IEA edition at the cadence's own reporting year, so a new edition re-prices all years together, while the in-assessment factors stay as released. The HAM guidance describes that method.

Changes

Therms accepted as an energy unit

`therm` (Therms) is added to the unit list of the facility energy sources and converts at 105.4804 MJ per therm. It is an energy unit, so it applies to every facility source that accepts energy units and needs no density. Vehicle sources do not gain the unit.

Validation of EACs against purchased renewables

The new validation `enpurcheacrenewequalcheck` fires when a facility reports Energy Attribute Certificates (`ensourcepurcheac` is `yes`) and the retired quantity converted to MJ (`eac_mj`) is exactly equal to its total purchased renewables (`ensourcepurchrenewtotal`). Exact equality is the usual signature of bundled certificates being reported twice, once inside a renewable contract and again as standalone EACs. The facility is asked to remove the duplicated amount before posting. The validation reads existing calculations and changes no total.

Tracking answers must agree with the source rows

Energy and water each ask about tracking at two levels: whether the facility tracks each (energy) or all (water) of its sources — `ensourcetrackopteach`, `ensourcevehicletrackopt` for vehicle fuels, `watsourcetrackoptall` — and, for every source it uses, whether that source is tracked. FEM 2026 adds nine validations that stop a filing from posting while the two disagree:

- a **Yes** to the source-level question while a used source is marked as not tracked;
- a **Partial Yes** while every used source is marked as tracked (the answer should be **Yes**);
- a **Partial Yes** while no used source is marked as tracked (the answer should be **No**).

Each message names the top-level question and says which of the two answers to change. **No** to `ensourcetrackopteach` now means that no energy source is tracked, and the energy source tables are not shown for that answer, the way the water source tables and the vehicle fuel table already behave. The validations apply to the FEM only; the Facility Data Module does not ask the top-level questions. They read existing answers and change no total.

Onsite renewable electricity applicability

`hasOnsiteElectricRenewables` is true when `ensourcefacility` includes onsite wind, solar photovoltaic or mini/micro-hydro. It drives the applicability of the onsite generation follow-up questions and is available to data consumers as a convenient flag; it has no effect on totals.

Biomass mix emission factors in FDM

FEM 2025 applied the reported biomass source mix to the biomass emission factor for FEM only; FDM 2025 always used the default 0.1139 kg CO2e per MJ. From FDM 2026 the mix questions are asked in FDM as well and the reported mix is applied exactly as in FEM.

Helper calculation retired

`ghg_emissions_increase_from_2024_model_percent`, the FEM 2025 helper that quantified the effect of the FEM 2025 emission factor model changes on each FEM, is not carried into FEM 2026 because no comparable model change was made.

Waste stream display text

The answer options for three waste streams are reworded: `slagnh` is now “Slag (Non-Hazardous) including boiler ash”, `slagh` is “Slag (Hazardous) including non-coal boiler ash” and `expired` is “Expired/unused/used chemicals (solvents, reactants, etc.)” (waste oil is now reported under the oil and grease streams). The ref_ids and the waste totals are unchanged.

Water, wastewater and waste totals

The water, wastewater and waste calculations documented in the FEM 2026 Water and Waste Calculations and in the wastewater section of the FEM 2026 Energy and Global Warming Calculations are unchanged from FEM 2025.