ENGIE Brasil Energia's Methodology for Calculating Avoided Emissions

ENGIE Brasil Energia adopts a structured and transparent methodology to calculate the greenhouse gas (GHG) emissions avoided by its assets and solutions. This methodology is aligned with international best practices and based on the GHG Protocol. The goal is to consistently and verifiably quantify the Company's contribution to the decarbonization of its clients and the transition toward a carbon-neutral economy.

The DeClic (Decarbonization of Clients) methodology was developed by ENGIE as a corporate guide to standardize the calculation of avoided emissions in new projects. This tool is the result of an extensive literature review, consultations with internal and external stakeholders, and testing in real-world cases. DeClic establishes basic principles that guide the calculations, such as:

1. **Clear definition of the assessment scope**: Definition of ENGIE's products or services that have a direct and measurable decarbonization impact for the clients to whom they are provided.
2. **Establishment of a reliable baseline**: A reliable baseline is crucial for assessing clients' contribution to decarbonization, serving as a reference point to measure the direct impact of products and services on the reduction of greenhouse gas (GHG) emissions.
3. **Consistency in data and factors used**: To ensure consistency in decarbonization calculations, reliable and comparable data and emission factors are used over time, ensuring repeatable and auditable measurements.
4. **Application of pragmatic and realistic methods**: Pragmatic accounting is essential to effectively assess clients' decarbonization (DoC), applying practical and realistic methods to measure and report impacts, ensuring that the data is useful and applicable in real-world contexts.
5. **Validation to avoid double counting**: Verifying the existence of double counting is crucial to ensure the accuracy and integrity of decarbonization calculations. Double counting occurs when the same GHG emissions reduction is accounted for more than once in different reports or by different entities.
6. **Transparent and independent communication from the corporate carbon footprint**: Client decarbonization must be verified and communicated transparently and separately from the company's own carbon footprint. It should not be combined with, added to, or subtracted from a company's own carbon footprint.

Through this methodology, ENGIE Brasil Energia ensures that its avoided emissions calculations credibly reflect the real contribution of its assets and solutions to global emissions reduction, promoting transparency with clients, investors, and society.

The approach used incorporates a **lifecycle analysis** of technologies, including both **direct and indirect emissions** (Scopes 1 and 3), such as those associated with equipment manufacturing and end-of-life disposal. For **renewable energy assets**, although generation does not produce direct emissions during operation, emissions from upstream and downstream lifecycle stages are accounted for.

The calculation of avoided emissions is based on the difference between the **average emission factor of the national electricity grid** (which includes fossil sources such as

coal and natural gas) and the **specific emission factor of the technology** operated or developed by ENGIE. The general formula is:

Avoided emissions = Energy produced × (EFGrid – $EF_{Technology}$), where:

- Avoided emissions in tCO_2e.
- Energy produced in kWh.
- EF_{SIN} corresponds to the emission factor of the National Interconnected System (SIN). That is, the GHG emissions produced by electricity generation distributed through a country's power grid. The sources may vary, including fossil fuels, nuclear energy, and renewable energy, forming the energy mix. Expressed in tCO_2e/kWh.
- $EF_{Technology}$ corresponds to the emission factor of the specific technology, such as a wind or solar power plant. Expressed in tCO_2e/kWh.

To ensure consistency across ENGIE's global data, the emission factors used are provided by **CRIGEN**, ENGIE Group's Research and Innovation Center. More information about the calculation methodology can be found at:

https://www.engieimpact.com/insights/decarbonization-of-customers.

The following table shows the results of the analysis of the **emissions avoided through ENGIE Brasil Energia's[1] wind and solar generation assets in 2024** and their potential for helping customers with their decarbonization strategy:

Generation type	Asset	Installed Capacity (MW)	Emissions Avoided (tCO2e)*
Eólica	Campo Largo	688	246,414
	Trairi	212	58,044
	Umburanas	360	143,083
	Santo Agostinho	434	84,068
	Assuruá	846	58,870
Solar	Assu Sol	752	2,938
	Assu V	30	5.611
	Floresta	86	11,466
	Juazeiro	120	14,751
	Lar do sol	200	24,324
	Nova Aurora	3	172
	Paracatu	132	12,753
	São Pedro	54	5,652
	Sertão solar	90	10,526
	Sol do futuro	81	9,939

Note: Data calculated in June 2025. The emission factor considers the life cycle, that is, the sum of direct emissions (generated during operation) and upstream emissions (generated throughout the production chain) in 2024.

[1] ENGIE Brasil Energia is in its second year of reporting DoC according to DeClic, selecting wind and solar generation assets for calculation. The company also generates renewable energy from hydroelectric and biomass-fired thermoelectric plants.