

SUSTAINABILITY STRATEGY

Carbon Baseline Methodology

Before you can reduce carbon emissions, you need to know where you stand. A carbon baseline is the documented foundation for all sustainability reporting, target-setting, and reduction planning. This guide explains what a baseline is, how it's built, and what to watch out for.

42%

Average carbon reduction for Sagiliti sustainability clients over 3 years

6 wk

Typical time to complete a Scope 1 & 2 baseline from verified data

Scope 3

Now required for many public company ESG disclosures under SEC rules

What a carbon baseline actually is

A carbon baseline is a historical record of your organization's greenhouse gas (GHG) emissions across a defined period — typically 12 months — expressed in metric tons of CO₂ equivalent (tCO₂e). It answers the question: *how much did we emit, and from what sources?*

The baseline becomes the reference point against which all future reduction targets are measured. Without a credible baseline, any claim about "reducing emissions by X%" has no foundation — and no credibility with investors, customers, or regulators.

Scope 1 vs. Scope 2 — what they cover

SCOPE 1**Direct emissions**

Emissions from sources your organization directly owns or controls — natural gas combustion in boilers and furnaces, on-site fuel use, fleet vehicles, and process emissions from manufacturing. These are calculated from fuel consumption records and emissions factors.

SCOPE 2**Purchased electricity emissions**

Emissions associated with the electricity you buy from the grid. Calculated by multiplying your kWh consumption by your grid's emissions factor. The emissions factor varies by region and grid mix — a utility in the Pacific Northwest has a very different factor than one in the Midwest coal belt.

Market-based vs. location-based Scope 2

Scope 2 can be reported two ways. Location-based uses the average grid emissions factor for your region. Market-based uses instrument-based factors — if you've purchased renewable energy certificates (RECs) or have a green power contract, your market-based number may be significantly lower. Most ESG frameworks (GRI, TCFD, CDP) require reporting both.

How a baseline is built — step by step

01

Define scope and organizational boundary

Determine which facilities, subsidiaries, and operations are included. This is a business decision as much as a technical one — and it needs to be documented clearly, because it defines what "a 30% reduction" actually means.

02

Collect utility and fuel consumption data

The most reliable baseline comes from actual utility invoices — not estimates or extrapolations. Collect 12 months of electricity, natural gas, water, and other utility bills for every site in scope. Missing invoices must be addressed before the baseline is complete.

03

Apply emissions factors

Multiply consumption data by appropriate emissions factors. For electricity, use EPA eGRID regional factors (updated annually). For natural gas and other fuels, use IPCC or EPA combustion factors. The source and vintage of emissions factors should be documented and consistently applied year-over-year.

04

Normalize for operational changes

If the baseline year included unusual operational conditions — a facility shutdown, a major acquisition, COVID-related closures — normalization may be required. This prevents an artificially low baseline from inflating the apparent magnitude of future "reductions."

05

Document, audit, and set recalculation rules

A credible baseline is documented with sources, assumptions, and methodology — not just a number. Establish rules for when the baseline will be recalculated (significant acquisitions, divestments, or methodology changes) so it remains comparable over time.

Common mistakes that undermine baseline credibility

Using estimates instead of invoices. Spreadsheet estimates of energy use are not a substitute for actual utility records. ESG auditors and disclosure frameworks increasingly require verified source

data.

Inconsistent organizational boundaries. Including one subsidiary one year and excluding it the next makes year-over-year comparisons meaningless. Define boundaries clearly and apply them consistently.

Outdated emissions factors. eGRID factors are updated annually as the grid changes. Using a factor from 2019 for a 2025 baseline will produce materially incorrect results — often overstating emissions from regions that have added significant renewable capacity.

Ignoring data quality issues. Billing errors in your utility records become errors in your carbon baseline. An audit of your utility data before building the baseline protects the credibility of everything that follows.

Baseline year selection matters. Choosing a high-emission baseline year makes future reductions look larger. Some frameworks allow flexibility in baseline year selection, but stakeholders are increasingly scrutinizing this choice. Select a year that is representative of normal operations and be prepared to explain the rationale.