# Carbon matching

Understanding this accounting methodology and how corporate energy buyers can build it into their procurement strategy


RE-Source
European platform for corporate renewable energy sourcing

# A smarter way to cut emissions: focus on when and where clean energy truly displaces fossil fuels.

# CONTENTS



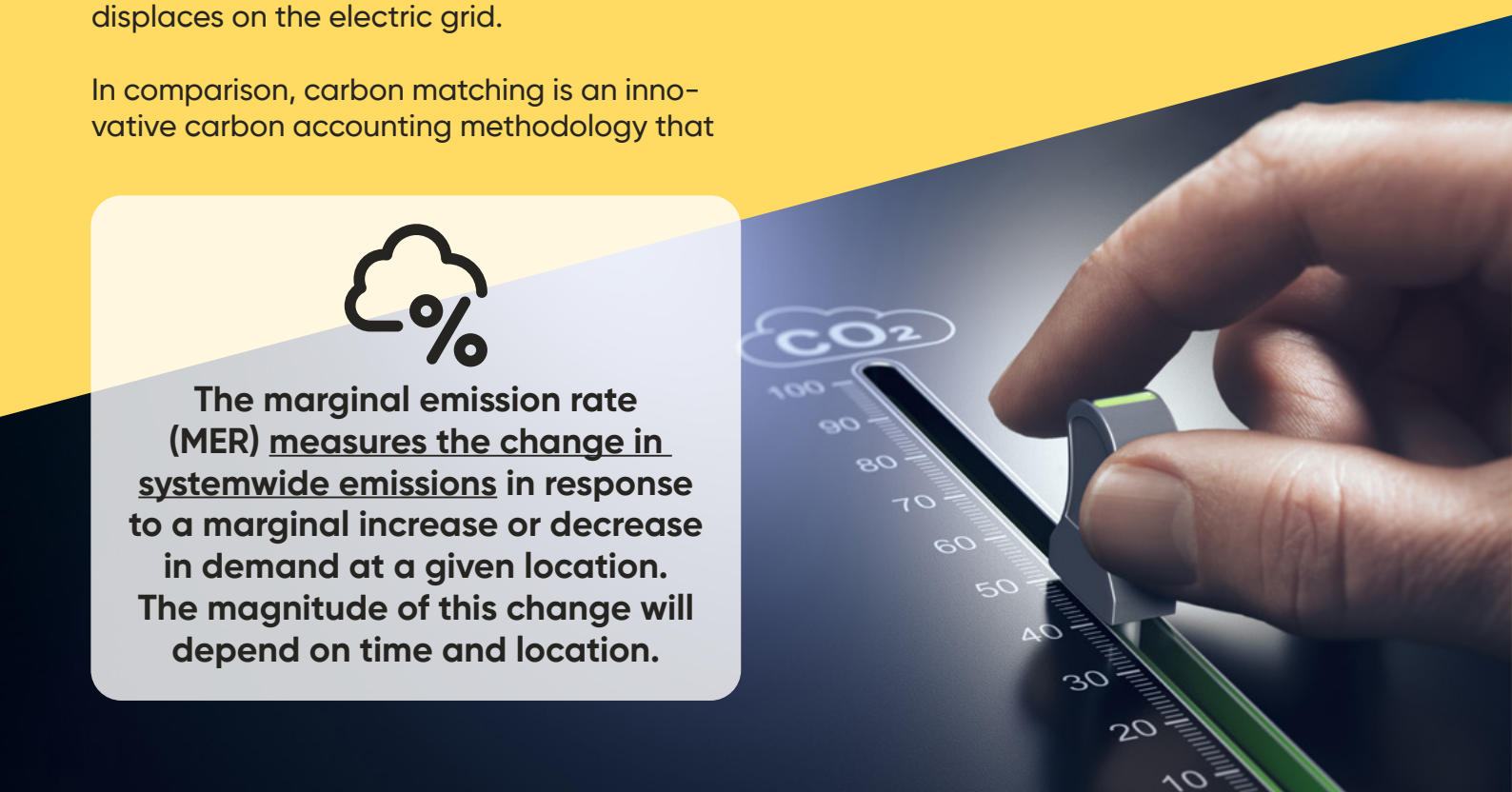
# WHAT IS CARBON MATCHING?

Since 2010, corporations have voluntarily purchased over 200 gigawatts (GW) of renewable energy and are far from slowing down. As the growth of clean energy procurement has increased significantly, there is greater scrutiny and ambition on ensuring that this procurement is impactful for decarbonisation.

Today, all megawatt-hours (MWh) of clean energy within a given market boundary are treated equally in the Greenhouse Gas Protocol's Scope 2 methodology, which is used by corporates to report progress in abating their emissions. For example, a MWh of clean energy generated within the EU-AIB member countries can be used interchangeably to abate emissions from a MWh of electricity consumption within those states. In current carbon accounting rules, this allows generation from Sweden to be used to abate emissions in Germany. Yet, we know the carbon impact of clean energy varies significantly, depending on time and location of the energy generated and the energy sources it displaces on the electric grid.

In comparison, carbon matching is an innovative carbon accounting methodology that focuses directly on carbon emissions rather than MWh of energy. This approach uses hourly marginal emissions rates at both the corporate's load and clean energy generation locations to calculate actual emissions impact. Under carbon matching, corporates must procure clean energy assets that displace carbon emissions equal to or greater than the emissions generated by their electricity consumption, taking into account both timing and location of generation and consumption.

This approach focuses on the heart of the issue – the emissions – to drive meaningful progress at the pace and scale the world needs. Such an approach helps organisations identify and prioritise investments that will most effectively accelerate grid decarbonisation. It also ensures that all technologies are measured in the same manner, leading to a technology-neutral approach that encourages innovation and investment in emerging clean energy products and services globally.




**The marginal emission rate (MER) measures the change in systemwide emissions in response to a marginal increase or decrease in demand at a given location. The magnitude of this change will depend on time and location.**

# WHY IS THIS IMPORTANT?

In 2010, when renewable energy penetrations were much lower, new renewable energy purchases were very likely to translate to meaningful greenhouse gas (GHG) emissions reductions. Today, as global renewable penetration grows, grid electricity mixes are dynamic and evolving and while some grids are rapidly decarbonising with increasing shares of clean energy, others remain heavily reliant on fossil fuels. This results in emissions impacts of clean energy generation that differ substantially based on time and location[1]. Similarly, the emissions impacts of new electricity consumption (load) also vary, and siting loads on cleaner grids which plan to deploy more clean energy can result in lower induced emissions.

Carbon matching can be used to report consequential impacts of Scope 2 related activities and assess the impacts of Energy Attribute Certificates (EACs) for use in the Greenhouse Gas Protocol market-based inventory method.

In the face of growing emissions rate variability, as well as improved data which allows for more sophisticated decision-making, the ability of electricity users to make decisions that maximise emissions reduction impact is more important than ever.[2]

# CASE STUDY

In 2023, Salesforce committed to purchasing 280,000 MWh over the next eight years from small, distributed clean energy projects across Sub-Saharan Africa, Latin America and Southeast Asia.[3] They prioritised sourcing projects in non-traditional markets, aiming to deliver both social and environmental benefits to local communities. These projects are expected to generate a significant emissions impact.

In 2024, Amazon announced its first utility-scale renewable energy project in Greece, where the majority of the region's power comes from carbon-intensive coal and oil. When located in Greece, Amazon's solar project is expected to help the region avoid more than 16,000 tons of carbon each year. That's nearly six times more carbon avoided than if the same project was located in a country like Sweden, where the grid is already powered with a higher concentration of clean energy sources.

Under the current system, there is no accountable emissions benefit for these actions.

[1] Source: REsurety. https://resurety.com/carbon-impact-of-intra-regional-transmission-congestion/
[2] Source: Electricity Maps. https://app.electricitymaps.com/map/72h/hourly
[3] Source: Emissions First Partnership – What is Carbon Matching?. https://www.emissionsfirst.com/what-is-carbon-matching

# CONSIDERATIONS FOR NEW BUYERS ON CARBON ACCOUNTING

Corporates looking to account for their emissions reduction using a carbon matching approach should incorporate the following methodology and principles into their sourcing strategy:

**FOCUS ON EMISSIONS IMPACT**

Calculate emissions by netting induced emissions from load and avoided emissions from clean energy investments using granular emissions data as available:

→ Induced emissions from load: multiply corporate load by the relevant marginal emission rate (MER) for the specific time and location of consumption.

→ Avoided emissions from clean energy investments: subtract the generator's emission rate from the relevant MER to the time and location, then multiply by generated energy.

→ These emission impact quantifications can be used to report net impacts of Scope 2-related activities in a consequential statement, separate from the inventory, or they can be used as a qualifier for eligible EACs used in a market-based method, so long as the market boundary meets the current Scope 2 Guidance requirements.

Check out **WattTime's Data Signals** for more information:

https://watttime.org/data-science/data-signals/marginal-co2/

## PRIORITISE DECARBONISATION

The emissions impact of a megawatt-hour of electricity depends on time and location, therefore accounting methods need to more accurately quantify this to help businesses make effective emission reduction decisions. Organisations should also value clean energy procurement based on the specific emissions impact to the affected grid.

## VALUE GRID DECARBONISATION PROGRESS

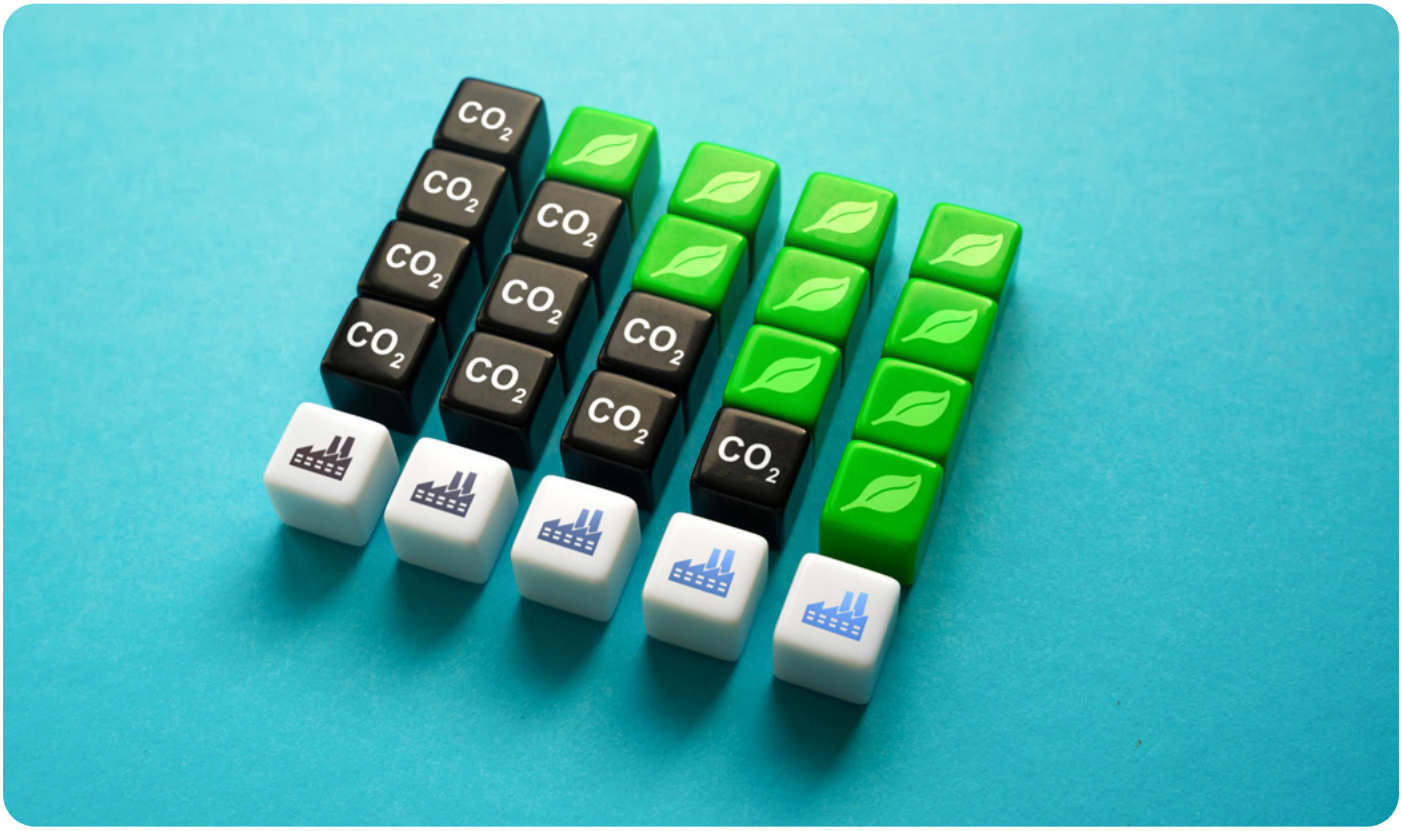
New energy buyers should ensure that corporate clean energy procurement and utility-supplied clean energy are both quantified and incorporated in accounting systems.

## INCENTIVISE INNOVATION IN THE EMISSIONS DATA ECOSYSTEM

To maintain the integrity and accuracy of the underlying emissions accounting data, organisations should embrace transparency and third party verification and favour continual improvements in data quality and availability.

## ACCOUNTING GOVERNANCE

As data and measurement complexity increases, organisations should continue accounting for and reporting on electricity emissions to their stakeholders. Any future methodology changes should avoid penalising clean energy procurement and ensure consistent treatment for all clean electricity technologies.



# WHAT ARE THE NEXT STEPS AND MAIN CONSIDERATIONS FOR A BUYER EXPLORING CARBON MATCHING?[4]

## INCENTIVISING TRUE DECARBONISATION

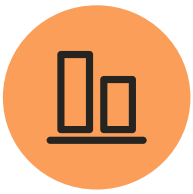
Carbon matching shifts the focus from measuring electricity consumption to assessing how an organisation's actions impact global emissions and climate change. By measuring the total impact actions cause on climate change, carbon matching incentivises organisations to take actions that will genuinely be most helpful to true decarbonisation.

## DETERMINING THE IMPACT OF ACTIONS

Carbon matching, sometimes known as emissions matching relies on the marginal emissions rate, allowing each participant to calculate their impact without depending on renewable claims from others. This approach ensures emissions burdens are not shifted to other actors, recognising that not all companies are equally motivated to drive impact.

## CALCULATING EMISSIONS IMPACT

Calculating emissions impact can be done by using different granularities (both spatial and temporal) of metre and grid data while still incentivising carbon-reducing behaviour. There is currently a widespread trend toward more granular emissions data – greater granularity better maps real-world total impacts.



## ADHERING TO SCOPE 2 EMISSIONS CALCULATIONS

A carbon matched footprint can be added alongside existing Scope 2 methods to provide a comprehensive emissions view, without adding reporting burden as it can be easily calculated from existing data.

[4] Source: Accounting for Impact: Refocusing GHG Protocol Scope 2 methodology on 'impact accounting'. https://watttime.org/news-and-insights/insight-brief-accounting-for-impact-refocusing-ghg-protocol-scope-2-methodology-on-impact-accounting/

## MORE INFORMATION AND REPORTS

As more companies adopt carbon matching strategies, more data will become available across more markets.

REsurety

Provides Locational Marginal Emissions (LMEs) data and information for corporate energy buyers.

https://resurety.com/

WattTime

Provides data and insights to help energy buyers understand how to cut emissions.

https://watttime.org/

McKinsey & Company

'Rethinking your company's clean-power strategy'.

Learn how companies can enhance their clean energy impact and reduce costs by adopting a grid-level approach to power investments, rather than focusing solely on their own energy consumption.

https://www.mckinsey.com/industries/electric-power-and-natural-gas/our-insights/rethinking-your-companys-clean-power-strategy

WattTime

WattTime Case Study of Meta's 2023 Emissions

https://watttime.org/news-and-insights/case-study-carbon-accounting-approaches-and-an-analysis-of-metas-2023-data-center-electricity-consumption-and-clean-energy-procurement/

CARBON TREASURE MAP

Discover the best places to build new clean energy to maximize the benefits to people and climate.

https://carbontreasuremap.org/

RE-Source
European platform for corporate renewable energy sourcing

resource-platform.eu

info@resource-platform.eu

Brought to you by

RE-Source European platform for corporate renewable energy sourcing
SolarPower Europe
Wind EUROPE
WBCSD World Business Council for Sustainable Development
CLIMATE GROUP RE100