CDP Technical Note

Accounting of Scope 2 emissions

CDP Corporate Questionnaire

Version number	Release / Revision date	Revision summary
1.0	February 8, 2013	• First published version.
2.0	February 8, 2015	• Updated to take in account new GHG Protocol Scope 2 Guidance and other necessary updates.
3.0	February 18, 2016	• Updated to align with the 2016 CDP climate change questionnaire
4.0	March 21, 2017	• Minor updates to align with the 2017 CDP climate change questionnaire.
5.0	June 7, 2018	• Minor updates to align with the 2018 CDP climate change questionnaire.
6.0	March 12, 2019	• Minor updates including: • New countries adherent to the International REC Standard (I-REC Standard) and Tradable Instruments for Global Renewables (TIGR Registry) (Section 3) • New clarification on market-based approach (Section 1)
7.0	April 03, 2020	• Updated to align with the 2020 CDP climate change questionnaire including: • Revised structure of the document • Updated Glossary: “low-carbon energy”, “RE100” added • New definition of the market boundary criteria for claiming renewable electricity use (section 2.3) • New countries adherent to the International REC Standard (I-REC Standard) • New information about Taiwan and Japan certificate systems
7.1	July 03, 2020	• Section 2.3 is updated with information on exemption for renewable energy sourcing contracts signed before 31st December 2021
8.0	April 12, 2021	• Updated to align with the 2021 CDP climate change questionnaire including: • Revised definitions of green electricity/power, TIGRs and International REC • Guidance added on questions companies can provide additional information for

		• European residual mix figure source updated to AIB • Revised guidance on the use of REGOs in the UK following Brexit • Revised guidance to clarify the use of green gas certificates
9.0	March 11, 2022	• Updated to align with the 2022 CDP climate change questionnaire including: • Clarified guidance on the market boundary criteria exemption • Clarified guidance on best practice of EAC vintage • New information on Chinese GECs • Updated country and regional guidance and resources
10.0	March 7, 2023	• Updated to align with the 2023 CDP climate change questionnaire including: • Clarification of the market boundary criteria in section 2.3. • Clarification on the use of green gas certificates for renewable electricity usage claims in section 3.5.
11.0	June 28, 2024	• Structural changes, clarifications, new introduction.

Contents

About this technical note

This technical note outlines how your how reporting to CDP should meet the requirements in the GHG Protocol Scope 2 Guidance. You should have a basic understanding of the Scope 2 Guidance before reading this technical note, especially around the dual reporting requirement, the scope 2 data hierarchy, and the Scope 2 Quality Criteria.

CDP has an accredited solutions provider program that can connect you with experience and expertise in scope 2 accounting, scope 2 emissions reductions initiatives (such as renewable energy procurement), and in reporting these emissions to CDP. For more information about the program please contact partnerships@cdp.net.

1. Essential reading

Key concept used in this document	Summary	Please read
Scope 1	Direct GHG emissions occurring from sources that are owned or controlled by the reporting organization.	The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition): Chapter 4 (Setting Operational Boundaries)
Scope 2	Indirect (upstream) generation emissions of purchased or acquired energy.	The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition): Chapter 4 (Setting Operational Boundaries)
Scope 3	All other indirect (upstream or downstream) emissions that occur as a consequence of the reporting organization's activities, but occur from sources not owned or controlled by the reporting organization.	The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition): Chapter 4 (Setting Operational Boundaries)
Organizational boundary	Defines the boundary of direct and indirect emissions for operations that fall within a reporting organization's established organizational boundary.	The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition): Chapter 3 (Setting Organizational Boundaries)
Operational boundary	The assignment of emissions sources into scope 1, scope 2, or scope 3 once the organizational boundary has been set.	The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition): Chapter 4 (Setting Operational Boundaries)
Inventory accounting (also called attributional accounting)	Accounts for GHG emissions or removals within a defined organizational and operational boundary.	Inventory and Project Accounting: A Comparative Review | GHG Protocolhttps://ghgprotocol.org/blog/inventory-and-project-accountinghttps://ghgprotocol.org/blog/inventory-and-project-accounting
Project-based accounting (also called intervention or consequential accounting)	Accounts for the impacts or changes in GHG emissions resulting from specific projects, actions, or interventions relative to a counterfactual baseline scenario. It evaluates system-wide emissions impacts of the project or intervention in question, without regard	Inventory and Project Accounting: A Comparative Review | GHG Protocolhttps://ghgprotocol.org/blog/inventory-and-project-accountinghttps://ghgprotocol.org/blog/inventory-and-project-accounting

to the reporting organization's operational or organizational inventory boundary.

Scope 2 terms	Summary	Please read
Dual reporting	A requirement for scope 2 emissions to be reported using two different methods: a location-based method and a market-based method.	GHG Protocol Scope 2 Guidance: Chapter 6 (Calculating Emissions) and Chapter 7 (Accounting and Reporting Requirements)
Location-based method	Scope 2 emissions that account for the average emissions characteristics of the grid from which energy is purchased.	GHG Protocol Scope 2 Guidance: Chapter 4 (Scope 2 Accounting Methods)
Market-based method	Scope 2 emissions that account for a organization's contractual instruments for specified energy (or its lack of choice in purchasing specified energy).	GHG Protocol Scope 2 Guidance: Chapter 4 (Scope 2 Accounting Methods)
Scope 2 data hierarchy	A hierarchy of instruments and data sources for calculating market-based scope 2 emissions at different levels of accuracy.	GHG Protocol Scope 2 Guidance: Chapter 6 (Calculating Emissions)
Scope 2 Quality Criteria	A set of criteria for determining whether a given contractual instrument can be used to make a market-based scope 2 claim for a given quantity of energy consumption.	GHG Protocol Scope 2 Guidance: Chapter 7 (Accounting and Reporting Requirements)

2. Introduction to scope 2

The GHG Protocol Corporate Standard divides an organization's GHG emissions inventory into direct and indirect emissions.

Direct emissions are emissions from sources that are owned and controlled by the reporting organization.

- These are scope 1 emissions.

Indirect emissions are emissions that are a consequence of the activities of the reporting organization, but occur at sources owned or controlled by another organization.

- Scope 2 emissions are the upstream indirect generation emissions of purchased or acquired energy.
- Scope 3 emissions are all other indirect (upstream or downstream) emissions that occur as a consequence of the reporting organization's activities, but occur from sources not owned or controlled by the reporting organization.

Scope 2 emissions are given their own category of indirect emissions for several reasons. Firstly, emissions from energy generation are one of the leading sources of global emissions (electricity generation accounts for nearly a quarter of all GHG emissions). Secondly, almost every organization purchases electricity, heat, steam, or cooling for its operations, and accurate data exists to relate use of purchased energy to GHG emissions (quantity of energy consumption multiplied by an emissions factor). The GHG Protocol Corporate Standard considers scope 3 an optional disclosure category but requires all reporting companies to report a minimum of both scope 1 and scope 2 emissions.

2.1 Key concepts in scope 2 that impact your reporting to CDP

The Scope 2 Guidance formalizes two methods for calculating scope 2 emissions: the location-based method and the market-based method.

Further reading to compare both methods: Table 4.1 in the Scope 2 Guidance.

2.1.1 Location-based method

Location-based scope 2 emissions account for the average emissions characteristics of the grids where energy consumption occurs.

Further reading: 4.1.1 in the Scope 2 Guidance.

2.1.2 Market-based method

Market-based scope 2 emissions account for the emissions from energy that the reporting organization has actively chosen (or its lack of choice). Many markets offer consumer choice in energy procurement, or, more accurately, contractual instruments that convey property rights to energy attributes. This means it is possible to consume energy from a grid that has a mix of generation resources on it, but claim to use the energy from specific resources, and report those resources' generation emissions under the market-based method.

Section 3.2 elaborates on how your contractual instruments should be reported to CDP.

Further reading: 4.1.2 in the Scope 2 Guidance.

2.1.3 Dual reporting

Companies must report both location-based and market-based scope 2 emissions if they have any operations in markets that offer the possibility of reporting market-based scope 2 emissions.

A reporting organization will report only a location-based scope 2 disclosure only if it exclusively operates in markets that do not offer the possibility of reporting market-based scope 2 emissions.

In practice, virtually every organization reporting to CDP must dual report (see Section 4.1).

Further reading: Figure 6.1 in the Scope 2 Guidance.

2.1.4 The emissions rate approach

An emissions rate approach describes how almost all GHG emissions inventories are calculated because it is usually not possible or practical to directly measure the GHG emissions being accounted for. While many sources of scope 1 emissions can be directly measured (for example, process or fugitive emissions) by the reporting organization, it is often necessary to use directly available 'activity data' that quantify the activity that caused the GHG emissions. Activity data are multiplied by an emissions factor to derive the GHG emissions the activity was associated with.
In scope 2, the activity data is the quantity of energy consumption that occurs, usually directly measured through a meter (but possibly estimated) and stated on an energy supplier bill. The source of emissions factors will vary depending on whether location-based emissions or market-based emissions are being attributed to the quantity of energy consumption (see Section 4.2).

Further reading: 4.2 in the Scope 2 Guidance.

2.1.5 Scope 2 data hierarchies

Scope 2 emissions factors come from a variety of sources varying in their granularity (precision) in both space and time.

Location-based emissions factors may attribute emissions from regional or subnational grids or the national grid average.

The market-based emissions factors to choose are dictated by what contractual instruments the reporting organization holds. These similarly attribute emissions with varying degrees of precision.

Further reading: Tables 6.2 and 6.3 in the Scope 2 Guidance.

2.1.6 Market-based Scope 2 Quality Criteria

The Scope 2 Guidance introduces Quality Criteria that a contractual instrument used to make a market-based scope 2 claim must meet.

Section 0 elaborates how you should report on how your market-based scope 2 inventory observes these Criteria.

Further reading: Table 7.1 in the Scope 2 Guidance.

2.1.7 Inventory and project-based accounting

Scope 1, scope 2, and scope 3 describe a reporting organization's GHG inventory, and use an inventory accounting concept (sometimes called attributional accounting). Inventory accounting *attributes GHG emissions or removals that have occurred* to an organization. In contrast, project-based accounting (sometimes called intervention or consequential accounting) measures the *consequence* of a project on emissions *relative to a counterfactual baseline scenario in which the project does not exist*. Project-based accounting methods are used, for example, to quantify the issuance of carbon credits. Project-based methods cannot be used to describe a GHG inventory because a GHG inventory does not compare itself with a counterfactual baseline scenario.

This means a carbon credit cannot be used in a scope 1, scope 2, or scope 3 emissions total. Emissions reductions from carbon credits are reported separately from the inventory total.

This does not mean that actions taken to reduce scope 2 emissions (such as purchasing renewable energy) are not associated with a consequential avoided emissions effect. It only means such effects are not accounted for in scope 2. Review 6.9 in the Scope 2 Guidance for more information on how such effects can be reported on in optional disclosures separately from the scopes. CDP does not currently capture avoided emissions claims except those based on purchases of carbon credits.

Further reading: Inventory and Project Accounting: A Comparative Review (blog post, GHG Protocol, 2023); 8.2.4 and 6.9, and Chapter 10 in the Scope 2 Guidance

3. Reporting your scope 2 emissions to CDP

3.1 Scope 2 emissions targets, totals, breakdowns, and intensity metrics

Question-specific guidance:

- **7.53.1: Provide details of your absolute emissions targets and progress made against those targets.**
    - Please note that this refers to 7.53.2 as well.
    - As some companies will be calculating two Scope 2 figures (market-based and location-based), they may wish to set specific targets for each figure. For example, a organization may intend to reduce their market-based figure through the purchase of renewable energy certificates, which would decrease that figure, but would not impact their location-based figure. This is just one approach to reducing emissions, and an organization may also decide to set a location-based target focused on decreasing energy consumption and improving energy efficiency. Thus, an organization can set targets for a location-based figure, a market-based figure, or potentially both.

- **7.54.1: Provide details of your targets to increase or maintain low-carbon energy consumption or production.**
    - Targets related to increasing low-carbon energy consumption or production are an important element of organizations' strategy to reduce their Scope 2 emissions.
        - This question does not require any Scope 2 data inputs, but can be linked to an emission target from question 7.53.1 in Column 16 "Is this target part of an emissions target?"

- 7.5: Provide your base year and base year emissions.
    - Companies should ensure that the base year inventory includes both a location-based and market-based Scope 2 total, if applicable.
- 7.3: Describe your organization's approach to reporting Scope 2 emissions.
    - Question 7.3 allows an organization to explain why they may not be providing a market-based emissions figure.
    - Your selection in the “Scope 2, market-based” column determines whether you see columns, rows and/or dropdowns related to the market-based method in following questions.
- 7.7: What were your organization's gross global Scope 2 emissions in metric tons CO_2e?
    - Companies are asked to provide both their Scope 2 figures (if applicable).
    - You may use the comment column to add information around the data source(s) for your location-based emissions, such as the granularity of the calculation. You can also note, if you are reporting market-based emissions, whether a location-based emissions factor has been used to calculate any market-based emissions due to unavailability of a residual mix factor. You should note, if you are reporting market-based emissions, any noncompliance with the Scope 2 Quality Criteria.
- 7.45: Describe your gross global combined Scope 1 and 2 emissions for the reporting year in metric tons CO_2e per unit currency total revenue and provide any additional intensity metrics that are appropriate to your business operations.
    - Companies are required to disclose their emissions intensity for combined Scope 1 and 2 emissions against their total revenue for the reporting year, as well as at least one other metric of their choice. However, companies are required to be transparent about which Scope 2 figure they use. Companies should specify this in column 5 “Scope 2 figure used”.
- 7.16: Break down your total gross global Scope 1 and 2 emissions by country/area.
    - Please note that this refers to 7.20.1, 7.20.2 and 7.20.3 as well.
    - CDP asks companies to provide a breakdown of Scope 2 figures. For example, companies are asked to breakdown their Scope 2 figures down by country/area/region, business activity, facility and emissions by activity. Each of these questions have columns for companies to provide a breakdown of their Scope 2 location-based market-based emissions. The purpose of CDP requesting these breakdowns is to increase transparency on how they were calculated. E.g. an organization may be required to provide both a market-based and location-based Scope 2 figure, but may also have operations in a country/area where there are no contractual instruments. By providing a country/area-specific breakdown, an organization can increase transparency on where there are contractual instruments.
- 7.10.2: Are your emissions performance calculations in 7.10 and 7.10.1 based on a location-based Scope 2 emissions figure or a market-based Scope 2 emissions figure?
    - In question 7.10.1, companies are asked to compare their combined Scope 1 and 2 emissions to the previous reporting year. Companies are only required to compare their Scope 2 emissions for just one Scope 2 figure (either location-based or market-based). In the interest of transparency, companies are required to state which figure they used.

- A organization may not have calculated a market-based figure in the previous reporting year. In this case, an organization can recalculate the previous year figure according to the market-based principles, and then compare it with the current reporting year's market-based figure.

3.2 Your activity data and your contractual instruments

In addition to providing scope 2 totals, breakdowns, targets, and intensity metrics, you can also disclose the underlying activity data and contractual instruments that were used in the calculation of your scope 2 emissions. These are captured in module 7 (Environmental Performance – Climate Change) in the Corporate Questionnaire.

- 7.30.1: Report your organization's energy consumption totals (excluding feedstocks) in MWh.
    - This question captures your total consumption of purchased electricity, heat, steam, and cooling underlying your scope 2 emissions disclosure

- 7.30.18: Provide a breakdown by country/area of your electricity/heat/steam/cooling consumption in the reporting year.
    - This question captures a country/area breakdown of the disclosures in 7.30.1 to help understand the scope 2 intensities by country/area reported in 7.16.

- 7.30.14: Provide details on the electricity, heat, steam, and/or cooling amounts that were accounted for at a zero or near-zero emission factor in the market-based Scope 2 figure reported in 7.7.
    - This question captures the contractual instruments that gave you claims to zero or near-zero market-based scope 2 emissions for certain quantities of use of purchased energy. See Section 4.3 to understand how the Scope 2 Quality Criteria impact this question.
    - RE100 companies are shown equivalent questions 7.30.17 and 7.30.18.

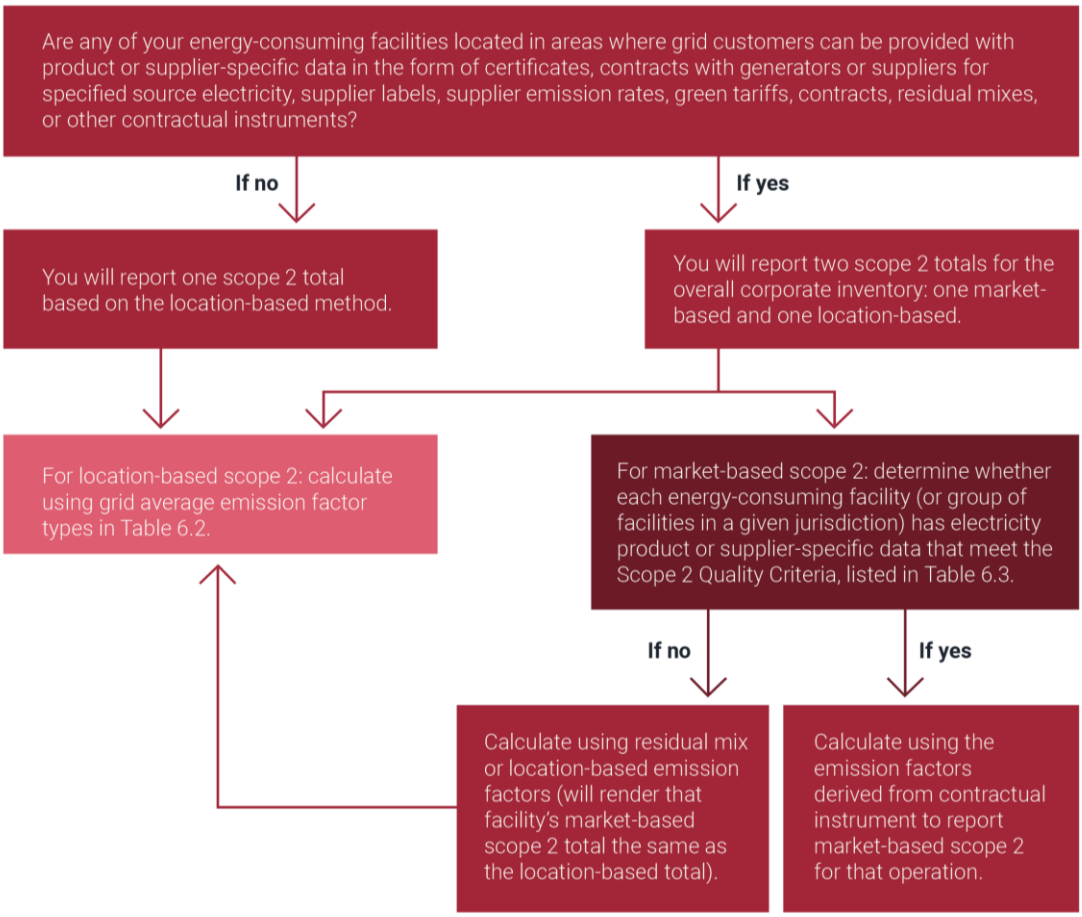
4. What scope 2 requirements impact your response?

'Shall' in the Scope 2 Guidance

The Scope 2 Guidance uses the word 'shall' for its minimum requirements. This chapter summarizes each of the 'shall' statements in Chapter 7 of the Scope 2 Guidance (Accounting and Reporting Requirements) and advises where in your CDP response your adherence to 'shall' statements can be evidenced.

4.1 Determining whether you shall dual report

Figure 6.1 in the Scope 2 Guidance gives a decision tree for determining whether you **shall** dual report scope 2 emissions, and guides you through finding the appropriate emissions factors to cover your energy purchasing.



The overwhelming majority of companies reporting to CDP disclose operations in at least one country or area where grid customers can be provided with product or supplier-specific data in the form of certificates or contracts with generators or suppliers for specified sources of energy, supplier labels, supplier emission rates, green tariffs, contracts, residual mixes, or other contractual instruments. Based on the 2023 disclosure cycle, **only six out of more than 23,000 companies** disclosed operating

exclusively in countries or areas that would imply they only needed to disclose location-based scope 2 emissions.

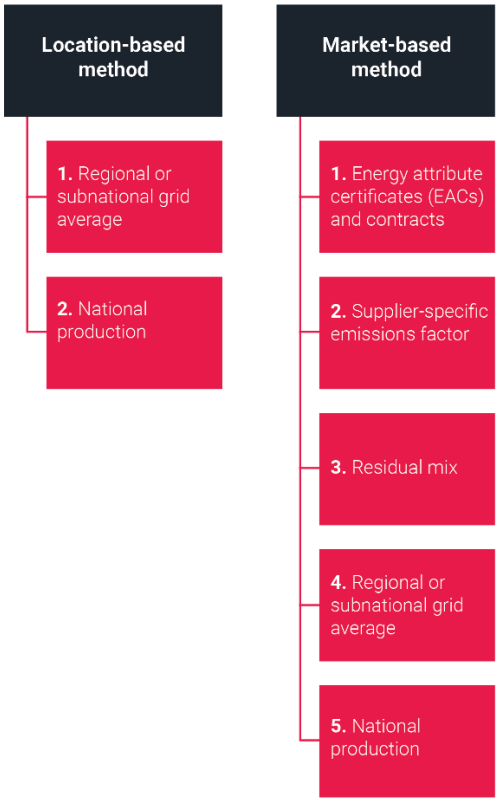
In the 2024 disclosure cycle, only 32% of companies reporting to CDP dual reported their scope 2 emissions.

How to report in line with the Scope 2 Guidance to CDP:

In question 7.7, dual report your scope 2 emissions if dual reporting applies to you.

4.2 Choosing the right emissions factors (scope 2 data hierarchy)

After understanding whether dual reporting applies, you must select emissions factors to pair with consumption of purchased energy. Location-based emissions will be calculated using location-based emissions factors for different geographic areas paired with the consumption of purchased energy in those geographic areas. Market-based emissions will be calculated using market-based emissions factors you are entitled to through contractual instruments, paired with the consumption of purchased energy consumed through each contractual instrument.



4.2.1 Emissions factors for market-based accounting

EACs and contracts

Energy attribute certificates (EACs) are standardized, tradable instruments issued to a unit of energy generation (usually, by MWh). These certify the origin of energy and convey property rights to energy attributes. They may be purchased with energy as a bundled supply or purchased unbundled from

energy. EAC registries exist in many countries. See Section 6 for country-level resources on what EAC registries exist.

Where EACs have not been issued to the purchased energy, a contract can provide the emissions factor. The contract must perform the equivalent tracking and property rights allocation functions that EACs perform. Such contracts can be, for example, power purchase agreements (PPAs) with grid connected generators and contracts with energy suppliers.

4.2.2 Supplier-specific emissions factor

Electricity suppliers supply electricity sourced from generation facilities that they operate and/or that they have purchased from the electricity market for delivery to users. Suppliers may offer specified products for electricity, certified through EACs or otherwise assigning specified generation to specified customers contractually.

The remainder of a supplier's electricity sales portfolio may not assign specified generation to specified customers, but still reflects sales of electricity from a range of generation resources to a group of energy consumers, from which a supplier-specific emissions factor can be defined. From 6.11.3 in the Scope 2 Guidance:

"*The emission factor must include all the electricity delivered by the supplier, including electricity it generates as well as electricity it purchases from others. Some supplier emission factors only include generation facilities owned by the supplier, which does not represent the full electricity delivered. In addition, it should only include renewables for which RECs have not been passed on to and retired by a third party.*"

The Scope 2 Guidance recommends that supplier-specific emissions factors be calculated using the methodology provided by the Climate Registry Electric Power Sector (EPS) Protocol. This methodology produces supplier-specific emissions factors that account for the attributes of generation from facilities operated by the supplier and from facilities operated by others (i.e. purchases from the electricity market), with or without certification through EACs. In practice, CDP understands many supplier-specific emissions factors consider the owned generation portfolio only (which leads to double counting if the supplier purchases electricity for re-sale), or additionally only attribute emissions to purchased and re-sold electricity using the residual mix (see below), which is less accurate than what the EPS Protocol methodology enables.

4.2.3 Residual mix

A residual mix emission factor represents the emissions and generation that remain after certificates, contracts, and supplier-specific factors have been claimed and removed from the calculation. It can be a regional or national factor. Residual mix factors are essential for accurate scope 2 accounting because they capture the emissions of the generation resources (usually, mostly fossil fuel resources) that have not been actively claimed by other companies through EACs, equivalent contracts, or supplier-specific emissions factors.

4.2.4 Other grid average emissions factors

Following the hierarchy, when emissions factors from certificates, contracts, suppliers or the residual mix are not available, you must use regional or subnational grid factors and, as an option of last resort, national production factors in market-based accounting. If these factors are present in your market-based scope 2 total, you **shall** disclose their use.

How to report in line with the Scope 2 Guidance to CDP:

In in column 4 "Methodological details" in question 7.7, declare if any market-based emissions were calculated using location-based emissions factors to cover the absence of a residual mix or other more precise market-based emissions factor.

4.3 Scope 2 Quality Criteria

Please see section 7.5 in the Scope 2 Guidance for more detailed guidance on each criterion.

All contractual instruments used in the market-based method for scope 2 accounting shall:
1. Convey the direct GHG emission rate attribute associated with the unit of electricity produced.
2. Be the only instruments that carry the GHG emission rate attribute claim associated with that quantity of electricity generation.
3. Be tracked and redeemed, retired, or canceled by or on behalf of the reporting entity.
4. Be issued and redeemed as close as possible to the period of energy consumption to which the instrument is applied.
5. Be sourced from the same market in which the reporting entity's electricity-consuming operations are located and to which the instrument is applied.
In addition, utility-specific emission factors shall:
6. Be calculated based on delivered electricity, incorporating certificates sourced and retired on behalf of its customers. Electricity from renewable facilities for which the attributes have been sold off (via contracts or certificates) shall be characterized as having the GHG attributes of the residual mix in the utility or supplier-specific emission factor.
In addition, companies purchasing electricity directly from generators or consuming on-site generation shall:
7. Ensure all contractual instruments conveying emissions claims be transferred to the reporting entity only. No other instruments that convey this claim to another end user **shall** be issued for the contracted electricity. The electricity from the facility **shall not** carry the GHG emission rate claim for use by a utility, for example, for the purpose of delivery and use claims.
Finally, to use any contractual instrument in the market-based method requires that:
8. An adjusted, residual mix characterizing the GHG intensity of unclaimed or publicly shared electricity **shall** be made available for consumer scope 2 calculations, or its absence shall be disclosed by the reporting entity.

CDP is frequently asked for its view around time matching (vintage) requirements (Quality Criterion #4), and location matching (market boundary) requirements (Quality Criterion #5).

4.3.1 Vintage limitations for purchased electricity

For a twelve-month reporting period, CDP recommends a vintage limitation of six months before the start of the reporting period, the twelve months of the reporting period, or three months after the end of the reporting period. This is a 21-month vintage limitation common to some international voluntary green power programs. CDP has not developed a view on this Quality Criterion for heat, steam, or cooling.

4.3.2 Market boundaries for electricity-related scope 2 claims

The Scope 2 Guidance does not give a concrete list of markets, but refers to the following characteristic elements of markets:

- Areas of production and consumption of energy that are linked by transmission infrastructure.
- Areas where certificates may be traded and redeemed, retired or canceled, as defined by regulatory authorities and/or certificate issuing bodies.
- Political or regulatory boundaries that define recognition of energy-related contractual instruments.
- The boundaries of the residual mix calculation.

This guidance is frequently misinterpreted or ignored by companies reporting market-based scope 2 emissions for their consumption of purchased electricity that undertake 'global matching'.

In the absence of any global implementation of 'market boundaries' for purchased electricity, CDP maintains a definition. A market for electricity-related scope 2 claims is an area where:

- The laws and regulatory framework governing the electricity sector are consistent between the areas of production and consumption.
- There is physical interconnection between generation and consumption.
- Utilities/energy suppliers recognize each other's energy sourcing instruments and have a system in place to prevent double counting of claims.

These conditions describe, almost universally, national borders.

CDP recognizes the following international markets for electricity-related scope 2 claims:

- The single market between the United States and Canada.
- The single market in Europe, defined below.

Countries in Europe meeting all the following conditions form a market for electricity-related scope 2 claims:

- The country is in the EU single market; and
- The country is a member of the Association of Issuing Bodies (AIB) and the AIB's Electricity Scheme Group and issues European Energy Certificate System (EECS) Guarantees of Origin; and
- The country has a grid connection to another country meeting the first two rules.

As of March 2024, the European countries meeting these criteria to form a single market for electricity-related scope 2 claims are:

Austria	Germany	Norway
Belgium	Greece	Portugal
Croatia	Hungary	Slovakia
Czech Republic	Italy	Slovenia
Denmark	Latvia	Spain
Estonia	Lithuania	Sweden

*The Channel Islands, Andorra, Liechtenstein, Monaco, San Marino, and Vatican City are included in CDP's view of a market for electricity-related scope 2 claims in Europe despite not meeting all three European market criteria. This because they have limited domestic electricity generation and instead import much of their electricity, including EECS GOs, from bordering Electricity Scheme Group member countries. Here, companies may make electricity-related scope 2 claims based on ex-domain cancellation of EECS GOs.

How to report in line with the Scope 2 Guidance to CDP

In question 7.7, you may describe how much of your market-based emissions disclosure does not meet the Scope 2 Quality Criteria. Use CDP's market boundary definition for electricity purchasing. Declare if a location-based factor was used in the market-based total to cover the absence of a residual mix for any energy consumption.

4.4 If you consume energy from facilities that you own/operate

Energy you consume from facilities you own/operate is normally not associated with scope 2 because your ownership puts the facility in your scope 1 boundary. However, if the attributes of the energy you consume from your facilities are not retained by your organization (e.g. any certificates are sold, or a contract entitles another organization to the attributes), then you **shall** report market-based scope 2 emissions for this energy consumption (using the residual mix emissions factor if available). See Table 6.1 in the Scope 2 Guidance for more information.

4.5 If you consume purchased energy generated from biofuels

Biogenic CO2 generation emissions associated with your energy purchasing are not accounted for in scope 2. These emissions are reported separately from the scopes. See 6.12 in the Scope 2 Guidance. You may report on your biogenic CO2 emissions in question 7.12.1 in the CDP Corporate Questionnaire.

5 Optional scope 2 disclosures

Please read Chapter 8 in the Scope 2 Guidance for more detail on GHG Protocol's recommended reporting on instrument features and policy context for scope 2.

How can companies go further with their Scope 2 reduction action? Section 11.4 of the GHG Protocol Scope 2 Guidance presents a range of procurement choices where companies can bring to bear their financial resources, creditworthiness, scale of consumption, technical knowledge, collaboration, or other approaches in order to help overcome traditional barriers to scaling the development of low-carbon energy.

These include a) Direct contracting with new low-carbon energy projects, b) working with electricity suppliers for new projects, c) establishing "eligibility criteria" for corporate energy procurement, relating to specific energy generation features or policy interactions that align with new low-carbon energy projects, and d) incremental funding or donations.

Companies can also help drive more impactful procurement by choosing projects based on their commissioning year. Progress towards zero carbon grids at scale requires new renewable electricity generation and focusing procurement on new projects can help support new generation.

Matching procurement geographically and/or temporally is another way to go further. Matching an organization's consumption of electricity with their procurement at e.g. the regional and the hourly level will create demand for the necessary low-carbon energy generation at specific times of day in their specific regions. This may require additional labels or attributes, such as hourly EACs issued under EnergyTag's Granular Certificate (GC) Scheme Standard.

Additional, voluntary labels are a way for companies to do more with their purchases. Green-e certification is one example. It is a leading certification program for renewable energy in North America. The additional label certifies that the renewable energy must be generated from new facilities, marketed with complete transparency and accuracy, and delivered to the purchaser, who has sole title.

The GHG Protocol Scope 2 Guidance mentions the EKOenergy label[1] as an option, as it is a mark of quality which comes on top of tracking certificates. Electricity sold with the EKOenergy label fulfils strict environmental criteria and raises funds for new renewable energy projects. Involvement, transparency and 'deeds not words' are important principles of EKOenergy's work.

Another example is Gold Standard, an international standard for climate security and sustainable development. Gold Standard[2] has developed an ecolabel for attribute tracking systems including for use in combination with the I-REC Standard, EECS-GOs in Europe and other national/regional systems adherent to their quality standards. The Gold Standard REC label includes stringent requirements to ensure renewable energy projects meet highest safeguards, are inclusive of stakeholders, contribute to sustainable development priorities, and generate new renewable energy that could not have otherwise been realized.

5.1 How to report in line with the Scope 2 Guidance to CDP

Much of this optional reporting can be disclosed in 7.30.14 (7.30.17 and 7.30.18 for RE100 companies). Chapter 8 of the Scope 2 Guidance also calls for country/area or other breakdowns of scope 2 emissions and underlying energy consumption, which are captured by CDP throughout the corporate questionnaire.

[1] https://www.ekoenergy.org/ecolabel/
[2] https://www.goldstandard.org/our-story/sector-renewable-energy

6 Country/area resources for emissions factors

6.1 Location-based emissions factors

Many countries' governments will publish a scope 2 location-based emissions factor for their grid(s).

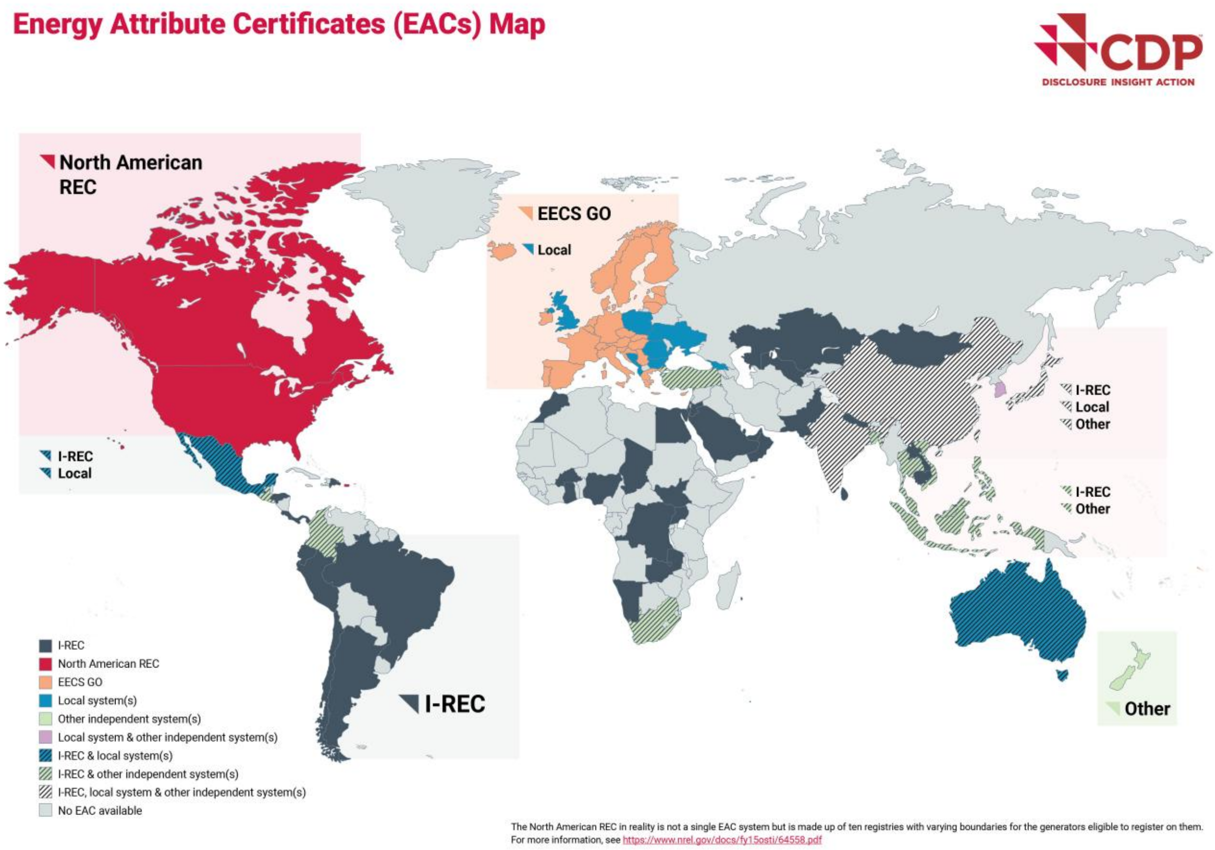
The International Energy Agency (IEA) maintains a list of scope 2 location-based emissions factors.

6.2 Energy attribute certificate registries

EACs from the following systems appear in companies' reporting to CDP:

EAC system	Governance	Country/area served	Additional resources/comment
Renewable Energy Certificate (REC)	Government-run	U.S. and Canada	The North American REC in reality is not a single EAC system but is made up of ten registries with varying boundaries for the generators eligible to register on them. For more information, see https://www.nrel.gov/docs/fy15osti/64558.pdf
Guarantee of Origin (GO)	Government-run	Europe	The Association of Issuing Bodies (AIB) maintains a system called the European Energy Certificate System (EECS), which standardizes GO issuance and trade across AIB member states in the Electricity Scheme Group. These states issue EECS GOs. GOs issued by non-member states are sometimes referred to as 'national GOs', and are not part of a harmonized system.
Renewable Energy Guarantee of Origin (REGO)	Government-run	United Kingdom	
T-REC	Independent	Taiwan, China	
Non-Fossil Certificate (NFC)	Government-run	Japan	
Green Electricity Certificate	Independent	Japan	
J-Credit	Government-run	Japan	
Tradable Instruments for Global Renewables (TIGR)	Independent		
Green Electricity	Government-run	China	

Certificate (GEC)			
I-REC for Electricity	Independent	At least 48 countries	https://www.trackingstandard.org/product-code/electricity/
Large-scale Generation Certificates (LGCs)	Government-run	Australia	https://www.cleanenergyregulator.gov.au/RET/Scheme-participants-and-industry/Power-stations/Large-scale-generation-certificates
Small-scale Technology Certificates (STCs)	Government-run	Australia	https://cer.gov.au/schemes/renewable-energy-target/small-scale-renewable-energy-scheme/small-scale-technology-certificates
New Zealand Energy Certificate System (NZECS)	Independent	New Zealand	https://bravetrace.co.nz/
Indian REC	Government-run	India	
Korean REC	Government-run	Republic of Korea	
Yenilenebilir Enerji Kaynak Garanti Sistemi (YEK-G)	Independent	Turkey	https://yekgnedir.epias.com.tr/
zaREC	Independent	South Africa	https://www.recsa.org.za/



6.3 Supplier-specific emissions factors

CDP is not resourced or organized to detail all countries where supplier-specific emissions factors are available. Generally, fuel mix disclosure (FMD) legislation like what exists in the European Union is a form of evidence that supplier-specific emissions factors are available. However, FMD legislation may typically only require a supplier to publicly disclose the generation mix and emissions profile of the generation that it owns, not the total supply of energy to consumers sourced from both its own generation facilities and energy markets.

6.4 Residual mixes

Residual mixes for European countries are published by AIB: https://www.aib-net.org/facts/european-residual-mix

Green-e publishes residual mixes for U.S. eGrid subregions that remove Green-e® Energy sales. These are incomplete residual mixes, since they only account for and remove specified energy certified by Green-e, which does not represent all specified energy sales.

The International Tracking Standard Foundation (I-TRACK) is working on calculating residual mixes for countries with I-REC registries. It is unclear whether these residual mixes will account only for and remove energy certified by I-RECs or whether they will also account for and remove energy tracked through other EAC systems or contracts.

Residual mixes are not widely available.

7. Frequently Asked Questions

7.1 Can I count a GO/REC/I-REC/TIGR towards my Scope 2 market-based target?

Yes.

7.2 Can I count certified emissions reductions (CERs) or verified emissions reductions (VERs) towards my Scope 2 market-based target?

No.

7.3 I buy special European credits from a label with guaranteed additionality, but they do not follow the GO system, can I count them towards my target?

CDP does not recommend that any electricity within the EU27 should be accounted for unless it is using European Guarantees of Origin.

7.4 Can I use European GOs to account for electricity consumption in USA?

No, as this wouldn't comply with the market boundary criteria as described in section 4.3.2. Please see the next question for more details.

7.5 Why can't I use RECs or certificates produced in certain jurisdictions in other jurisdictions?

As a minimum condition, you should use RECs that are within the same market boundary as described in section 4.3.2, e.g. if you have operations in North America, you are expected to use RECs (USA and Canada) and not Guarantees of Origin (GOs), which are the instruments used in Europe. Likewise, your European operations are expected to use GOs and not North American RECs or other instruments from other geographies. Unlike offsets, electricity tracking instruments are not expected to become global commodities, but regional commodities. This is because there are physical restraints to the transmission of electricity that should be respected by the tracking instrument trade. A good example is the case of islands, for example Iceland. There is no connection between Iceland and mainland Europe. As such, buying Icelandic GOs as a supply of European based consumption is seen as a problematic practice. These considerations could be extended to reflect transmission capacity between countries, which could add layers of complexity that, at the current stage of development of the system, are still difficult to address. The best way to address them is to source renewable energy from local renewable sources.

7.6 Can I use UK green tariffs in order to account for lower Scope 2 emissions?

Yes, depending on the tariff chosen. Some tariffs are 100% renewables, some are not, but the supplier has the obligation to inform the customer about it.

7.7 Can I use an emission factor provided by my supplier?

Yes, in your market-based Scope 2 figure.

7.8 Where can I find corrected emission factors for the grid?

You should check with the relevant grid authority or regulator for up-to-date corrected emission factors where available. For example, the AIB has calculated corrected grid emission factors for all EU countries.

7.9 I purchase offsets that are based on renewable energy generation, can I account for these in my Scope 2 figure?

No. In this case the origin of the offsets doesn't really matter. According to the GHG Protocol Corporate Standard, offsets should be reported as separate information from the gross emission figures that Scope 1, 2 and 3 represent.

You can report your use of offsets in questions 7.79 and 7.79.1 where you can provide details of any project-based carbon credits cancelled within the reporting period as well the purpose of those purchases.

7.10 Can RECs/GOs/IRECs/TIGRs be reported in 7.79?

Question 7.79 only applies to companies that have issued the carbon credits or who have purchased them for the purposes of compliance or as voluntary carbon offsets. Therefore, they cannot be reported here.

7.11 If we purchased more RECs than the amount of energy we actually consumed (1 REC= 1MWh), can we then enter a negative Scope 2 figure?

No. RECs are not offsets – they are a way to attribute an organization's energy purchase to a renewable source and claim the low carbon benefit. That is why RECs are a regional product - the energy used should be in the same market boundary as the energy produced and represented by the certificate. Even if they were offsets, in accordance with the GHG Protocol, CDP asks companies to report on gross emissions that do not take offsets under consideration. None of the emission fields in the CDP questionnaire will allow a negative response for this reason.

7.12 We operate in a country that has 100% electricity from hydroelectricity. How should we report this?

If the fuel mix in your national grid has a large proportion of renewable energy, then naturally your carbon emissions per MWh are going to be lower than in countries that have a higher proportion of fossil fuel-based sources in the grid mix, and therefore your Scope 2 emissions calculated with the location-based method will be low. However, you should not report renewable energy usage which is sourced from grid mix as active renewable energy procurement.

In countries where contractual instruments do exist, companies should report Scope 2 (market-based) emissions using the emission factor provided by the contractual instruments, or the residual mix emission factor. If your organization is not directly purchasing energy from renewable energy providers, you should be using the residual mix emission factor. Only in countries where contractual instruments or residual mix emission factors do not exist, can companies use the grid average emission factor.

8. Worked examples

8.1 Example 1 – On-site production of non-grid connected renewable electricity owned by another organization with no tracking instruments generated.

It is becoming common for an organization to supply the space, while another organization implements and manages the renewable energy installation that produces electricity. This electricity can then be fed to the organization that is providing the space and consumed "on the spot". For the sake of this example we will assume the following energy profile of Organization 1:

- It has multiple facilities (remote equipment, e.g. diesel generators) around the world that consume small amounts of electricity, as well as large buildings that are grid connected;
- It has installed solar panels at its facilities in Argentina which are owned and managed by another organization; the 15,000 MWh generated by these solar panels are supplied to Organization 1 and are subject to an agreement between the two parts which is equivalent to a sale;
- Their energy supplier in the USA provides them with a supplier-specific emissions rate;
- For all other electricity, the organization is being supplied by the grid and does not have any special agreements with its suppliers or buy and retire any type of certificates.

Country/Region	Scope 2, location-based (metric tons CO_2e)	Scope 2, market-based (metric tons CO_2e)
United States of America	*19,000*	*22,000*
Canada	*10,000*	*11,000*
United Kingdom	*30,000*	*32,000*
Spain	*10,000*	*13,000*
Argentina	*10,000*	*10,000*

(7.16) Break down your total gross global Scope 1 and 2 emissions by country/region.

(7.30.1) Report your organization's energy consumption totals (excluding feedstocks) in MWh.

Since the organization is reporting a market-based Scope 2 figure, they should also use this in 7.30.1. They will thus use market-based methods to calculate the MWh from renewable sources for this question. The table below details their calculations.

Country/region	Total MWh	Emissions Factor used	MWh from renewable sources	MWh from non-renewable sources
United States of America	*100,000*	*Supplier-specific emissions rate (6.5%)*	*6,500*	*93,500*
Canada	*100,000*	*None*	*0*	*100,000*
United Kingdom	*140,000*	*Residual Mix (8,93%)*	*12,502*	*127,498*
Spain	*100,000*	*Residual Mix (7.51%)*	*7,510*	*92,490*
Argentina	*100,000*	*Contract*	*15,000*	*85,000*

In Canada, they do not have energy certificates or contracts, supplier/utility-specific emission rates, or a detailed residual mix. Therefore, to avoid double-counting by using grid average emissions factors, they have assumed 0 MWh from renewable source. Similarly, in Argentina they have no active sourcing outside of their contract and have assumed 0 additional MWh from renewables as they do not have access to anything other than grid average emissions factors.

Based on these calculations, they would report the below in 7.30.1:

Activity	Heating value	MWh from renewable sources	MWh from non-renewable sources	Total MWh
Consumption of fuel (excluding feedstock)	*HHV*	*0*	*1,500,000*	*1,500,000*
Consumption of purchased or acquired electricity		*41,412*	*498,588*	*540,000*
Consumption of purchased or acquired steam		*0*	*100,000*	*100,000*
Consumption of self-generated non-fuel renewable energy		*0*	*0*	*0*
Total energy consumption		*41,412*	*2,098,588*	*2,140,000*

(7.30.14) Provide details on the electricity, heat, steam, and/or cooling amounts that were accounted for at a zero or near-zero emission factor in the market-based Scope 2 figure reported in 7.7.

Country/area of low-carbon energy consumption	Sourcing method	Energy carrier	Low-carbon technology type	Low- carbon energy consumed via selected sourcing method in the reporting year (MWh)
Argentina	*Purchase from an on-site installation owned by a third party (on-site PPA)*	*Electricity*	*Solar*	*15,000*

Tracking instrument used	Country/area of origin (generation) of the low-carbon energy or energy attribute	Are you able to report the commissioning or re-powering year of the energy generation facility?	Commissioning year of the energy generation facility	Comment
Contract	*Argentina*	*Yes*	*2017*	*We have established a contract with Solar Organization, a provider of solar energy solutions, where they own and manage all our on-site installations and we buy the electricity from them.*

8.2 Example 2 – A organization purchasing RECs in the USA

Organization 1 is a USA based organization with installations in Oklahoma, California, Upstate New York and Colorado. It consumes the following amounts of electricity:

	MWh
MROW	*200,000*
CAMX	*150,000*
RMPA	*40,000*
NYUP	*30,000*
Total USA	***420,000***

Its Oklahoma facility also purchases 100,000 RECs (1 REC=1MWh) from an Oklahoma wind farm. The facility is within the MROW eGRID sub-region, so when doing its calculations to compute the electricity Scope 2 market-based footprint for MROW it uses the Green-e residual mix for the portion of power it does not have RECs, this is 200,000 – 100,000 = 100,000 MWh. The 100,000 MWh for which it has RECs are computed using the specific RECs emission factor, which in this case because it is a renewable energy source, will be assumed to be 0 t CO_2e/MWh. Thus, the footprint, calculated for each

	Total MWh	lb/MWh (Green-e Residual Mix 2019)	t CO_2e
MROW	*(200,000 – 100 000) = 100,000*	*1,149.60*	*52,145*
CAMX	*150,000*	*461.46*	*31,397*
RMPA	*40,000*	*1,274.88*	*23,131*
NYUP	*30,000*	*232.36*	*3,162*
Total USA	***320,000***	-	*109,835*

eGRID sub-region will look like the following table:

Thus, compared to the scenario where RECs would not have been bought, Organization 1 has reduced its electricity market-based Scope 2 footprint by 64,644 t CO_2e. The organization has also consumed 10,000MWh of fuel (for energy purposes) during the reporting year.

Based on the published Green-e Residual Mix, the organization has calculated the % of MWh from renewable sources in the eGRID sub-regions (CAMX = 44%, MROW = 30%, NYUP = 42%, RMPA = 30%). Using these percentages, it calculates its MWh from renewable sources. Its CDP disclosure would look like this:

Activity	Heating value	MWh from renewable sources	MWh from non-renewable sources	Total MWh
Consumption of fuel (excluding feedstock)	HHV	0	10,000	10,000
Consumption of purchased or acquired electricity		100,000 + 120,600 = 220,600	199,400	420,000
Total energy consumption		220,600	209,400	430,000

(7.30.1) Report your organization's energy consumption totals (excluding feedstocks) in MWh.

(7.30.14) Provide details on the electricity, heat, steam, and/or cooling amounts that were accounted for at a zero or near-zero emission factor in the market-based Scope 2 figure reported in 7.7.

Sourcing method	Energy carrier	Low-carbon technology type	Country/area of low-carbon energy consumption	Tracking instrument used
Unbundled energy attribute certificates (EACs) purchase	Electricity	Wind	USA	US-REC

Low- carbon energy consumed via selected sourcing method in the reporting year (MWh)	Country/area of origin (generation) of the low-carbon energy or energy attribute	Commissioning year of the energy generation facility	Comment

100,000	USA	2020	Organization 1 has bought 100,000 RECs from an Oklahoma wind farm and reflected that in its total Scope 2 footprint provided in 7.7. This led to a reduction of 64,644 t CO_2e from its market-based footprint.