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Decarbonizing with virtual power purchase agreements

Understand how evolving emissions disclosure guidance shapes decisions about using VPPAs

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Executive summary

With the clock ticking on a global climate emergency and investors pressing companies for progress on environmental, social, and governance (ESG) issues, decarbonization is moving up the corporate and political agenda. Across sectors and geographies, organizations of all shapes and sizes—from publicly traded companies to non-profit organizations to government agencies—are setting aggressive environmental goals with reducing greenhouse gas (GHG) emissions as a central component.

A key means for meeting sustainability targets is by getting electricity from renewable sources directly—generated on-site (e.g., through solar roofs) or through power purchase agreements (PPAs). There is also an indirect way: through virtual power purchase agreements (VPPAs). By entering into a VPPA, an organization can create the need for a third party to produce more renewable energy, while the organization receives a credit for the production of such electricity, such as solar or wind, therefore making headway toward decarbonization while also realizing financial benefits, such as tax credits or incentives.

While use of PPAs for renewable energy is growing, for many facilities this physical connection is not feasible. In these cases, organizations seeking to advance decarbonization goals are increasingly pursuing VPPAs, a financial transaction that establishes a renewable energy credit (REC), which counts toward scope 2 GHG emissions reductions under select reporting frameworks.

VPPAs are complex financial instruments effecting organizations' renewable energy sourcing decisions across the equally complex global power markets. The reporting of GHG emissions reductions from VPPAs is no less complex, with multiple intersecting frameworks, standards, and guidance.

In this paper we show how sustainability and finance leaders can derive value from VPPAs. We also look at how shifting guidance on GHG reporting affects decisions about using VPPAs. Understanding the impact of complex regulatory changes on renewable energy sourcing strategies is a key opportunity for organizations to advance toward decarbonization goals more effectively.

Key take-aways

- Evolving guidance for procuring renewable energy credits through VPPAs has implications for organizations seeking to claim GHG reductions within the market-based reporting method. Shifts in the recognition of market boundaries may change how organizations across industries and power markets evaluate VPPAs as a part of current and planned sustainability strategies.
- There is increasing regulatory focus on criteria around how to account for scope 2 emission reductions from RECs, including the location of where renewable energy is generated versus where GHG reductions are claimed. This makes it important to review guidance on the issue before entering into VPPA opportunities in certain geographies. The definition of market boundary can be unclear, so deciphering requirements and implications is critical for off takers.
- The Climate Disclosure Project's market boundary criteria that were first introduced in 2020 and modified through 2022 will likely spur greater attention towards the location of renewable generation in the context of RECs for GHG reporting restrictions. Additional reviews of the market-based accounting methodology by the GHG Protocol and Science-based Targets Initiative point to broader potential changes to this accounting process.
- Sustainability and finance leaders can benefit from a better understanding of renewable energy sourcing options available within their power markets in light of evolving VPPA reporting guidance.

The basics: How VPPAs work and the key benefits they provide

A VPPA is a type of third-party PPA contract between an energy-consuming organization and generator to purchase renewable energy to reduce carbon emissions (albeit with no real transfer of energy).

Under this structure, an organization that engages in a VPPA with a generator of renewable energy receives RECs that account for GHG reductions. This is based on the idea that energy bundled and acquired through a VPPA is directly attributable to additional renewable energy being added to the grid. The energy consumer pays a negotiated price per MWh to the renewable energy developer. This price is then offset by the wholesale price received from the sale of renewable energy produced by the renewable energy developer and sold into the wholesale power market.

Unlike a physical PPA, a VPPA is purely a financial transaction. There is no physical delivery of energy, and the organization that enters into the VPPA continues to buy power from its local utility. A VPPA can be signed across national or state borders.

Compared to some renewable energy sourcing methods, VPPAs are quick and scalable. They can also be structured to mitigate the impact of price fluctuations. However, as with all financial instruments, VPPAs entail financial risk, which varies depending on the exact terms of the contract. Another consideration for entering into VPPAs is how much is being contributed to the decarbonization of the local grid. If the renewable energy developer is based in a different power market, the VPPA may technically not be contributing to the local power market's grid decarbonization.

Exhibit 1. VPPAs are complex financial contracts

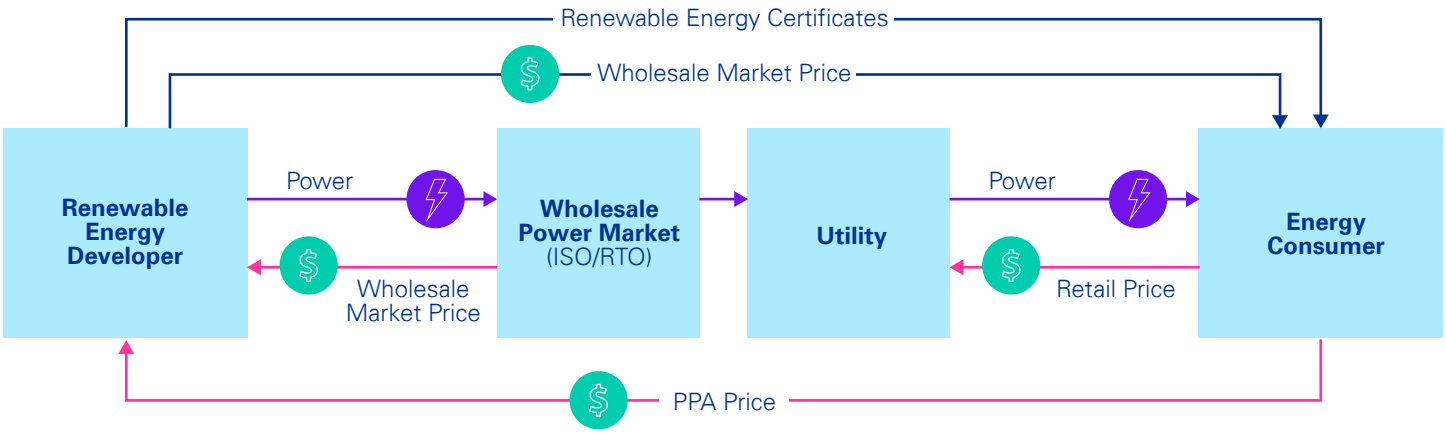

Exhibit 2. Examples of VPPA contracts

Organizations across the public and private sector engage in VPPAs of varying sizes. A small subset of examples is below.

Organization	Project size	Energy type	Counterparty
Takeda	350 MW	Wind	Enel North America
McDonalds	255 MW	Solar	EDF Renewables North America
Boston University	205 MW	Wind	ENGIE North America
Kraft Heinz	158 MW	Wind	Berkshire Hathaway Renewables

The challenge: Guidance on VPPAs is evolving

GHG reporting requirements call for organizations to use one of two (or both) allocation methods: location-based and marked-based.

Market-based vs. location-based scope 2 emissions reporting

Scope 2 emissions are indirect emissions that result through the use of purchased electricity, steam, heat, or cooling. These emissions depend on the amount of energy used and mix of fuel to generate that energy. There are two main approaches to quantify those emissions:

- **Location-based approach:** Considers average emission factors for the grids in which the energy consumption occurs
- **Market-based approach:** Considers contractual arrangements under which the organization procures power from specific sources, including energy attribute certificates such as renewable energy certificates (RECs) and Guarantees of Origin (GOs)

Regulatory frameworks related to the market-based accounting method are evolving. Several GHG standards bodies, including the GHG Protocol and the Science-Based Targets Initiative (SBTi), are carefully reviewing scope 2 emissions accounting via the market-based method, including its application for RECs emissions reporting.[1] Furthermore, non-profit organizations, such as the GHG Management Institute, question the practice of counting RECs toward an organization's GHG emissions footprint altogether, under any reporting methodology.[2]

There is an increasing focus on the location where organizations procure renewable energy relative to where they are claiming GHG reductions. This is part of an effort to validate that actual emissions reductions are being realized in an organization's operating region. In 2020, the Carbon Disclosure Project (CDP), a nonprofit that helps investors, organizations, cities, states, and regions manage their environmental impacts, established market boundary criteria for scope 2 renewable electricity use to address this concern. Under the reporting guidance in version 7.0 of its Technical Guidance on Accounting Scope 2 Emissions, organizations must source renewable electricity from within the boundary of their power market to be eligible to report and claim GHG emissions reductions in the market-based accounting method.

In March 2022, the CDP released version 9.0 of this guidance to clarify that these criteria apply to all existing contracts signed after December 31, 2021, making contracts before that date exempt.[3] Given that most market boundaries can be defined across national boundaries, this development is especially impactful to multi-national organizations considering cross-border VPPAs. This situation highlights the evolving nature of scope 2 accounting guidance and criteria.

Understanding market boundary criteria

The CDP defines a market boundary as an area in which:

- The laws and regulatory framework governing the electricity sector are consistent between the areas of production and consumption.
- There is a physical interconnection between the point of generation and the point of consumption of renewable electricity. When interconnection happens across different grids, there must be a level of system-wide coordination between such grids.
- The markets' utilities and energy suppliers recognize each other's energy sourcing instruments and have a system in place to prevent double counting of claims.

[1] Source: Andres Change, "The evolution of scope 2 accounting, target setting and monitoring," Science Based Targets Initiative, May 9, 2022

[2] Source: Alissa Benchimol, "What questions do you have about green power 'purchasing'?," GHG Management Institute, March 4, 2022

[3] Source: "CDP Technical Note: Accounting of Scope 2 emissions," Carbon Disclosure Project, March 11, 2022

The impact: GHG reporting criteria could have widespread effect on VPPA usage

Numerous national and global nonprofit standard setters and regulatory authorities have developed frameworks and guidelines for organizations claiming GHG emissions reductions. The landscape is by no means unified, and most guidance is just that—guidance—not hard and fast rules. For instance, under the revised CDP guidance, organizations must be more mindful of where the renewable energy in the VPPA is generated vs. where the organization is based. The market boundary restriction adversely impacts organizations considering VPPAs outside of their market boundary.[4] In this example, even organizations that do not currently follow CDP guidelines should take note of the changes and re-evaluate renewable energy sourcing options available in their markets. It is highly possible other framework-issuing organizations will adopt similar market boundary criteria, given recent trends of partnerships between reporting bodies and alignment of GHG reporting methodologies (see Exhibit 3).

Standard setters are also closely considering ways to ensure that VPPAs meet criteria for additionality, meaning that the contractual arrangement actually results in incremental renewable energy demand for the grid, in order to justify the renewable energy certificate that is provided to the buyer. If the financial PPA is undertaken with a project under development, it may support a strong claim of directly adding new green power capacity and can be used by the developer to help secure project financing.[5]

While specific standards vary, other significant reporting frameworks echo the changes or new criteria put forth by other frameworks. A notable example is a recent proposal by the SEC, which, if adopted, would expand GHG emissions disclosure requirements for public organizations related to the use of RECs. The proposal would require public companies to disclose detailed information on an annual basis about climate-related targets, activities and progress, including how RECs are being used as part of the net emissions reduction strategy. Public companies would need to disclose the risks that availability or value of RECs might be diminished by market or regulatory change—indicating a general view of RECs usage as a potential material risk to businesses, operations, and financial positions.[6]

[4] Source: "U.S. Electricity Grid & Markets," U.S. Environmental Protection Agency, updated May 5, 2022

[5] Source: "Guide to purchasing green power," U.S. Environmental Protection Agency, updated September 2018

[6] Source: "Climate Risk: SEC's Mandatory Climate Disclosures Proposal," KPMG LLP, March 2022

Exhibit 3. GHG reporting landscape

Today, dozens of nonprofit standard setters and regulatory authorities oversee several GHG reporting standards with a wide variety of requirements on VPPAs. However, there have lately been signs of alignment and convergence. Exhibit 3 summarizes the main players, their VPPA criteria, their guidance on market-boundary restrictions, and their relationships with other standard-setters.

Standard	Inter-relationships	Inclusion of VPPA criteria?	Inclusion of Market-boundary criteria?
GHG Protocol[7]	TCFD and SEC recommend using GHG Protocol methodology and CDP guidelines utilize GHG Protocol.	Yes, the GHG Protocol's calculation of scope 2 emissions under the market-based approach includes RECs and direct contracts, such as PPAs.	Yes, scope 2 guidance outline that all contractual instruments must be sourced from the same market in which the reporting entity's electricity-consuming operations are located and to which the instrument is applied.
Carbon Disclosure Project (CDP)[8]	CDP's disclosure platform provides the mechanism for reporting in line with the TCFD recommendations.	Yes, renewable energy sourcing contracts (VPPAs, GOs, RECs) involving transactions outside of the identified market boundary signed up to Dec. 31, 2021 will be accepted in CDP reporting until the end of the respective contract period.	Yes, organizations must source renewable electricity from within the boundary of the market in which they are consuming the electricity.
Science-Based Targets Initiative[9]	Partnership between the CDP, United Nations Global Compact, World Resource Institute, and the World Wide Fund for Nature. SBTi approach is aligned to the GHG Protocol's Scope 2 guidance.	Yes, aligned with GHG protocol criteria outlined above.	Yes, aligned with GHG protocol criteria outlined above.
Sustainability Accounting Standards Board (SASB)[10]	In September 2020, CDP, CDSB, GRI, IIRC and SASB announced a shared vision for a comprehensive corporate reporting system that includes both financial accounting and sustainability disclosure, connected via integrated reporting.	Yes, while the standard does not mention VPPA, SASB provides criteria for contractual agreements like Guarantees of Origin (GOs) and RECs.	No information provided.
Value Reporting Foundation[11]	The International Integrated Reporting Council (IIRC) and the Sustainability Accounting Standards Board (SASB) merged in 2021 to form the Value Reporting Foundation.	No, does not provide scope-wise emission reporting criteria as a result information on contractual instruments not included.	No information provided.
Global Reporting Initiative (GRI)[12]	In September 2020, CDP, CDSB, GRI, IIRC and SASB announced a shared vision for a comprehensive corporate reporting system that includes both financial accounting and sustainability disclosure, connected via integrated reporting.	GRI requires accounting and reporting energy indirect GHG emissions based on both the location-based and market-based methods, if reporter has any operations in markets providing product or supplier-specific data in the form of contractual instruments.	No, requires organization to provide location and market-based scope 2 values. The market-based method reflects emissions from electricity that an organization has purposefully chosen (or its lack of choice).
Taskforce on Climate-Related Financial Disclosures (TCFD)[13]	Recommends GHG emissions should be calculated in line with the GHG Protocol methodology to allow for aggregation and comparability across organizations and jurisdictions.	Implied, since TCFD asks the reporter to report market-based emissions which take into account contractual instruments, this can be inferred.	No information provided.
Securities and Exchange Commission (SEC)[14]	Incorporates TCFD-based disclosures.	Yes, asks the reporter if they have set climate-related targets or goals to disclose information on carbon offsets or renewable energy credits.	No information available.
U.S. Environmental Protection Agency (EPA)[15]	References GHG Protocol Scope 1 & 2 guidance.	Yes, under market-based approach the instruments include energy attribute certificates, contracts and supplier-specific emission factors.	No information provided.

[7] Source: Stephen Russell and Mary Sotos, "Public Sector Protocol: Interpreting the Corporate Standard for U.S. Public Sector Organizations," Greenhouse Gas Protocol, October 2010 [8] Source: "How CDP is aligned to the TCFD," CDP

[9] Source: "SBTi Criteria and Recommendations," Science Based Targets, April 2020

[10] Source: "Implementation primer," SASB Standards

[11] Source: "About us," Integrated Reporting (part of IFRS Foundation)

[12] Source: "Universal Standards: Setting a new global benchmark for sustainability reporting," GRI

[13] Source: Michael Bloomberg, "Recommendations of the Task Force on Climate-related Financial Disclosures," TCFD, June 2017

[14] Source: "Market regulation," Municipal Securities Rulemaking Board

[15] Source: "EPA's eDisclosure," U.S. Environmental Protection Agency, updated February 23, 2022

What to do now: Advice on renewables sourcing in a changing regulatory landscape

The rules regarding VPPAs will continue to evolve. Therefore, sustainability and finance leaders should review renewable energy sourcing options and contract types against their organizations' short- and long-term environmental and financial objectives.

Based on our experience helping numerous organizations understand and address complex reporting changes, we offer four recommendations for optimizing renewable energy sourcing strategies:

Start by following the most conservative guidance available:

To ensure they will be able to recognize emissions reductions, organizations should consider today's most restrictive guidance as the guiding light for future VPPA acceptance. Given the attention of the SEC and other governing bodies on specific details around RECs, we anticipate an overall market shift toward the CDP's market boundary criteria and the broader scrutiny of the market-based accounting approach taking shape soon. As such, even organizations that are not currently affected by one framework should understand the broader reporting landscape in their VPPA strategy or risk losing out on future opportunities to claim GHG reductions.

Assess old and new contracts against updated criteria:

Organizations considering establishing new VPPAs must closely consider if and how the latest guidelines change the value proposition of this contract. Business leaders must keep new regulations in mind for go-forward contracts and also consider any existing contracts that are up for renewal, and then new criteria to which they will now also be held.

Conduct a comprehensive market assessment:

Linking complex external factors to major renewables producers in the energy market is a key step for organizations to procure the best option green power products to effectively meet decarbonization targets. Sustainability and finance executives should lead an analysis of relevant market rules from a legal, regulatory, financial, tax and technical point of view, including how the reporting criteria updates affect the current strategy and contracts. The next logical step is to model different green power procurement scenarios based on all collected information and use the output to evaluate and rank the optimal sourcing options.

Stay abreast of continually evolving regulation:

Organizations must pay careful attention to other interrelated regulatory bodies that are in the process of developing market boundary based GHG reporting guidelines. Standards bodies are continuously considering new developments being raised within the broader regulatory landscape and by stakeholders including non-profits, governments, and organizations. Consistent dialogue with regulators will help organizations develop an outlook on future developments so organizations can proactively get ready to address impacts to sustainability strategies, processes and operations.

How KPMG can help

Renewable energy sourcing is one of the most impactful levers for organizations to decarbonize their portfolios and realize their sustainability goals.

Using our best-in-class PPA track record, expertise on the latest PPA developments, deep knowledge of the renewable energy sector, and advanced modeling capabilities, KPMG helps organizations evaluate renewable energy sourcing options for optimal alignment with corporate goals.

Our guidance carefully considers an organization's sustainability objectives, operational considerations, procurement structure feasibility and financial management to reveal the full picture value of each option. With these insights in hand, we help structure and execute renewable energy contracts that drive decarbonization in support of the broad sustainability strategy.

We help clients at every stage of decarbonization journey, from initial climate strategy to executing energy contracts. Services include:

- Confirmation of sustainability objectives
- Regulatory, economic and market assessment
- Scenario analysis
- Procurement roadmap
- Procurement execution

How we help clients with renewable energy sourcing

Assessing energy sourcing options

A large industrial manufacturing company sought support in its renewable energy procurement strategy and execution. A KPMG team with expertise in renewable energy sourcing worked with the client to understand their short-term and long-term objectives and requirements and outline potential options and considerations. The team used client data, regulatory and competitive market research, and industry knowledge to evaluate procurement options, regulatory insights, and supplier considerations, and developed a report outlining commercial considerations with each procurement option. KPMG then supported the procurement process to execute on the chosen pathway, providing the client with continued support through the full renewable energy sourcing process.

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Mark is the lead for the U.S. Climate Advisory practice with more than 20 years of strategy consulting experience in M&A, commercial and operational due diligence, and post-close delivery to a wide array of corporate and private equity clients. Mark focuses on helping corporate and private equity clients design practical ESG strategies that drive value creation.

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Frederick has more than 24 years of experience providing financial advisory services to corporates, energy infrastructure investors, government agencies, and utilities on energy infrastructure project finance and procurement across a range of capital investments in renewables and carbon-free projects (utility-scale solar, onshore and offshore wind, geothermal, and nuclear), campus district energy systems, energy storage, and HVDC transmission.

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Fiona has more than 15 years of cross-industry experience providing infrastructure financial advisory services. She specializes in renewable energy feasibility studies, PPA assessments, project finance, procurement assistance, term sheet development, and commercial and financial structuring. Fiona has provided financial evaluations of renewable energy projects, including PPAs and VPPAs, for corporate clients and government agencies.

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Mary has more than 8 years of experience focused on transformation, sustainability, and operational execution. Her advisory services have spanned ESG strategy and operationalization, decarbonization, and corporate strategy and transactions. She also has experience working in the renewable energy field, with a focus on wood bioenergy.

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