

# Shaping the Future of Energy, Materials and Infrastructure: Accelerating Renewable Energy Corporate Power Purchase Agreements in Emerging Economies

WORLD  
ECONOMIC  
FORUM

BRIEFING PAPER  
AUGUST 2021

## Introduction

This briefing paper highlights the significant economic and emission reduction benefits that can arise if steps are taken to remove the barriers that exist to the implementation of corporate power purchase agreements (CPPAs) in emerging economies. These benefits are numerous – from helping local companies to decarbonize, to protecting supply chains and incentivizing flows of investment capital into emerging markets; a necessary condition to achieving national and corporate climate goals. The paper also highlights specific barriers to CPPAs as well as various recommendations to help remove them.

Corporate demand for clean electricity has the potential to drive investment in renewable energy and accelerate the global energy transformation. As such, it is a very important tool in helping to mobilize capital.

While CPPAs have been prevalent for over a decade, recent years have seen a marked increase in this market globally, particularly in the United States, United Kingdom and Europe. An increasing number of global corporations are committing to transition to 100% renewable energy procurement over a defined period. This trend is likely to increase exponentially given the extensive commitments being made to decarbonize across all business and industrial sectors. However, notwithstanding the economic and climate benefits of CPPA, significant obstacles to the use of CPPAs remain in many emerging and developing markets.

The briefing paper sets out the key barriers to using CPPAs in emerging economies, the strong economic arguments for implementing legislation to remove the barriers, and key recommendations to help these economic benefits be realized.

## BOX 1 Corporate power purchase agreements

A corporate power purchase agreement (CPPA) is a long-term power purchasing mechanism between an electricity generator and corporate customer allowing the customer to procure renewable energy. It provides certainty over the wholesale price of energy over a particular period typically subject to indexation. On the generator side, the CPPA provides an attractive and predictable revenue stream which assists in customer and risk diversification, and eases access to capital. It also enables developers to construct new renewable infrastructure without reliance on government tariffs, especially in regions where renewable resources and electricity prices are strong enough for projects to be economic without such supports.

The World Economic Forum's Task Force on Mobilizing Investment for Clean Energy in Emerging and Developing Economies – together with the CEO Climate Leaders Alliance – formed a working group led by Brookfield Renewable and KPMG to study CPPA challenges in emerging markets. The work undertaken by the group included:

- Obtaining practical relevant experiences from working group members
- Undertaking a detailed analysis of key jurisdictions, including in India, Indonesia, Viet Nam, Malaysia, Thailand, Ukraine, Mexico, Chile and Brazil (see Appendix)
- Interacting with relevant stakeholders to obtain wide-ranging perspectives on key issues

# Economic advantages of a liberalized CPPA regime

The removal of barriers to implementing the wide range of CPPA solutions now being sought by global corporations will produce significant economic and climate benefits for the jurisdictions in question. There are four areas where these benefits should arise:

## 1. The race to net zero

The demand for renewable energy CPPAs is growing exponentially across the world. This is driven by the rise of net-zero and carbon neutral commitments being made by countries and global corporations that have committed to achieving significant carbon reductions by a particular timeline – typically from 2030 to 2050. In implementing their net-zero ambitions, corporations will look to the procurement of renewable power as a critical solution in reducing their Scope 2 issues. This trend means that countries with favourable CPPA regimes have the opportunity to significantly increase the deployment of renewable energy and to reduce their dependence on unabated power solutions.

In fact, the lack of ability to procure renewable power will increasingly have an adverse influence on direct foreign investment for countries. Corporates' emission footprints and reduction strategies are now playing a critical role in their investment decisions. The expansion of data centres perfectly exemplifies the fact that the availability of (directly procured) renewable energy is becoming a must have for global organizations. Countries having adopted favourable CPPA regimes (such as Chile or Taiwan, China) are seeing significant new inward investment levels.

## 2. Safeguarding supply chains

When a global corporation makes a net-zero commitment, it is also, in effect, committing to decarbonizing its supply chains. This will result in additional pressure for suppliers across the world, including in emerging economies to implement decarbonization solutions such as CPPAs for their own business.

Suppliers that are not in a position to implement CPPA solutions will leave themselves exposed to the risk that their customers will seek alternative suppliers in other jurisdictions that are capable of implementing these types of renewable power solutions. Additionally, creating an environment where suppliers can implement cost-effective CPPA structures can help mitigate the impact of other climate transition measures that might adversely impact their business such as the Carbon Border Adjustment Mechanism. Suppliers who use renewable energy solutions will also be less exposed to carbon taxes.

## 3. Additionality

An increasing component of any CPPA structure is the concept of additionality. Additionality normally requires the construction of new renewable energy generating technologies that would not have otherwise been constructed. This brings two essential benefits. First, the additional build-out of renewable capacity helps the country meet its own national renewable energy targets. Second, the new facility creates additional employment

opportunities, both during the construction phase, and, to a lesser extent, during the operational phase.

## 4. Wider economic benefits

Removing barriers to the adoption of CPPAs offer a range of benefits, including:

- Overall economic benefits – associated with increased deployment of renewable energy in a given jurisdiction.<sup>1</sup>
- Security of supply – increasingly relevant given the growing number of weather events resulting in partial or almost complete shutdowns of the power system.
- Bottom-line improvement for the corporate sector – with renewables now being a cheaper source of energy than fossil fuel solutions in many countries; this is especially relevant for countries and corporates showing heavy power and fuel consumption.
- Opportunities to introduce new clean energy technologies – while wind and solar technologies will continue to dominate the CPPA market as the technologies of choice, developers will inevitably start adding new technologies to the solution mix in order to improve the overall financial returns, such as green hydrogen, floating offshore wind, tidal and wave, etc.
- Adoption of various digital solutions – blockchain and artificial intelligence are increasingly being used to establish the provenance and verifiability of renewable energy certificates and would be encouraged by an active CPPA market.

---

## Key barriers to the acceleration of the CPPA market in emerging economies

The following is a summary of barriers that the working group has identified:

- Heavily regulated power markets with limited private sector participation. In these circumstances, system operation, power distribution and pricing are sometimes state controlled, all of which serve to prevent the acceleration of a localized CPPA market. In particular, the requirement that all renewable power generated must be sold to a single buyer (typically a state-owned entity) represents a very serious challenge in many jurisdictions.
- Regulatory positions preventing the wheeling of power through open grid access which in turn means that offsite power purchase agreement (PPA) solutions are not possible to implement. This is particularly important as onsite solutions are not always possible for a variety of reasons (landlord-tenant relationship, short duration of tenancy, building infrastructure not capable of hosting solar plants, etc.) Additionally, in countries where grid access is permitted, there are often challenges in terms of visibility/stability of regulatory levies. Generally speaking, CPPA regulations and wheeling arrangements need to be determined as bankable by the international finance community to unlock meaningful foreign investment on the basis of CPPAs.

<sup>1</sup> IRENA, World Energy Transitions Outlook: 1.5°C Pathway, 2021.

- Limitations in the ability to do onsite generation due to restrictions on capacity and/or restrictions on exporting excess power to the grid.
- Other regulatory difficulties can also arise in certain countries which complicates the use of virtual PPAs.<sup>2</sup> For example, in the case of India, there is confusion about whether the financial regulator is responsible for virtual PPAs given the “derivative” nature of the contract or whether the electricity regulator has oversight given the instruments used to transact power.
- Lack of credible or transparent systems for issuing, tracking and certifying renewable energy certificates, thus creating a barrier for corporates to invest in renewable energy.
- From a demand standpoint, the cost of renewables has historically sometimes been a barrier for off-takers. Although renewables are becoming the lower-cost form of bulk electricity in many locations, their cost competitiveness could be further enhanced by enabling a level playing field on which renewable electricity competes fairly with fossil-fuel electricity.
- Lack of suitable grid infrastructure, particularly to take on new renewable generation.
- Complexity and length of permitting processes for renewable energy investments.
- Lack of local developers, which can reduce the ability to execute PPA transactions (although it is thought that creating a CPPA market would have a positive influence on local and international developers in the territory).
- Insufficient government-backed support mechanisms. Contracts for Difference (CfDs) are a good example of such mechanisms. Leveraging synergies between government-backed support and corporate off-take will contribute to create a resilient CPPA market.
- Currency risk is one of the key difficulties for investors, especially in an emerging or developing market. However, this is much less of an issue with CPPAs as transactions are often done using the home currency of the corporation’s parent.

This is by no means intended to be an exhaustive list as there are numerous country-specific barriers that may need to be addressed. While the list is focused on the key challenges that are specific to emerging economies, various other implementation challenges are prevalent in more mature markets.

## Next steps

Deregulating the CPPA market to enable onsite and offsite solutions will not just increase the deployment of renewable energy in the relevant country, thereby helping to achieve decarbonization benefits, but it will also produce wider economic benefits and produce lasting competitive advantages. In particular, the creation of these new renewable opportunities through removal of barriers will facilitate much greater foreign direct investment into those countries. However, it is vital that these external flows of capital help mobilize local developers

and local supply chains over time which in turn will help decrease dependence on external investment and reap greater longer-term benefits for these emerging economies.

The working group envisages a number of actions to further accelerate the deployment of CPPAs and associated benefits:

- Communicate the economic opportunities of liberalizing the CPPA market for emerging economies to key stakeholders at the 26th UN Climate Change Conference of the Parties (COP26) in Glasgow in November 2021.
- Seek a commitment from the Alliance of CEO Climate Leaders to support the importance of this initiative and the specific recommendations around the removal of barriers; tangible commitments from the supply and demand sides as well as from governments will also be sought ahead of COP26.
- Help emerging economies examine the specific barriers applicable to their country with a view to implementing enabling legislation to facilitate the local CPPA market; engage with a number of jurisdictions to highlight the opportunities that are available. Specific policy recommendations entail:
  - Removing the requirement to sell renewable power to a single state owned buyer
  - Removing prohibitions against wheeling of power through open grid access
  - Clarity on regulation around the ability to do virtual CPPAs
  - Clear regulatory guidance to facilitate CPPAs and clear policy direction from governments around its willingness to foster renewable CPPAs in its jurisdiction
- Encourage greater usage of cross-border CPPAs – both virtual and physical. Although the preferred solution should be that the generation and consumption take place in the one country, cross-border solutions will become increasingly necessary to help organizations fulfill their net-zero commitments in the immediate term; this will act as an incentive for countries to act locally on CPPAs and reap much of the economic benefits from the increased deployment of renewables.



## Call to action

The working group calls on governments and other key stakeholders to reflect on the arguments made in this briefing paper and take steps to create an enabling environment for CPPAs. This is an opportunity not only to scale up the level of renewable deployment globally, but also to create wide-ranging economic benefits in emerging economies.

<sup>2</sup> A virtual CPPA is a purely financial transaction whereby the buyer does not receive nor own the physical electrons generated by the project.

## Appendix

The working group analysed nine key jurisdictions from emerging and developing markets, from the angle of their current conduciveness to CPPAs. The analysis looks specifically at the fixed barriers to CPPAs from a power market design perspective. The removal of those fixed barriers is an absolute prerequisite to enable CPPA investments, regardless of other underlying country factors. We recognize that there are potentially other predictable and unpredictable country barriers to CPPAs, such as political risk, social acceptance risk, currency fluctuation risks and others. These types of risks, however, are generally dependent on other interim societal factors and are not included in this analysis.

	Corporate PPA conditions			Demand Potential		Power Generation Profile	
Conditions	Power market conditions enabler	Country's regulatory position on CPPA	Lack of other barriers	Presence of local renewable energy developers	Presence of potential corporate buyers	Potential for decarbonization	Capacity to build additional renewable infrastructure using CPPAs
Detailed aspects	<p>Country is not subject to single state-owned buyer conditions</p> <p>Degree of decentralization of energy system is compatible with industrialized nations and/or policy exists to liberalize to such comparable levels</p> <p>Independent power producers and renewable energy generators have direct access the grid and consumers</p>	<p>CPPAs or virtual PPAs are allowed</p> <p>Cross-border PPAs are allowed</p> <p>No restrictions on private-to-private power delivery</p>	<p>Market liberalization is the only barrier to CPPAs</p> <p>There are no network constraints such as grid capacity limitations</p> <p>There are no limiting regulations such as currency / foreign investment restrictions</p>	<p>Presence of a developed technology sector able to close the renewable skills gap after deployment</p>	<p>Based on RE100 list of corporations</p> <p>(&lt;20% = Low, 20%-50% = Moderate, &gt;50% = High)</p>	<p>Current portion of non-renewable energy power usage that has potential for decarbonization</p> <p>(&lt;20% = Low, 20%-50% = Moderate, &gt;50% = High)</p>	<p>% of renewable energy market open to CPPAs / % of renewable energy target</p> <p>(0%-30% = Low, 30%-60% = Moderate, &gt;60% = High)</p>
Optimal State	High	High	High	High	High	High	High
Brazil	Moderate	High	High	High	High	High	High
Chile	High	High	Very Low	High	High	High	High
Mexico	Moderate	Low	Low	High	High	High	High
India	Moderate	Low	Low	High	High	High	Low
Thailand	Moderate	Very Low	Low	Moderate	Low	High	High
Ukraine	Low	Moderate	High	Low	Low	Low	Low
Viet Nam	Low	Low	Moderate	Moderate	Low	High	Low
Indonesia	Low	Very Low	High	Low	Very Low	High	Low
Malaysia	Very Low	Very Low	Low	Low	Very Low	Very Low	Low

Degree to which country context is currently conducive to CPPA* *Compared to other emerging and developing markets		Comments / Recommendations
Optimal State	High	
Brazil	High	Environment is considered broadly conducive to CPPAs although policy improvements are suggested to allow private-to-private power delivery for residential consumers.
Chile	High	Environment is considered broadly conducive to CPPAs although investments in grid capacity to improve power distribution capacities and off-taker sell-back to the grid would constitute robust power market improvements.
Mexico	High	Environment is considered broadly conducive to CPPAs although policy improvements are suggested to allow CPPAs generally and further liberalize the market through private-to-private power delivery for residential consumers. Investments in grid capacity could minimise power distribution restrictions and increase opportunities for off-taker sell back to the grid.
India	High	Environment is considered broadly conducive to CPPAs although policy improvements are suggested to enable cross-border CPPAs and further liberalize the market through private-to-private power delivery for residential consumers. Diversion of existing/agreed investments meant for fossil fuel power generation to renewable energy power would also constitute a substantial improvement.
Thailand	Moderate	Moderately conducive environment due to partial/ongoing power market liberalization. While the CPPAs are currently allowed, there are only a small number of renewable energy power market investors. An increase in international renewable energy investors would have a great impact on the uptake of renewable investments by international markets. Lifting restrictions on private-to-private power delivery would also be beneficial.
Ukraine	Moderate	Moderately conducive environment due to grid capacity coverage. While some CPPAs and cross-border CPPA agreements exist, they are subject to single buyer market conditions which limit the ability of the market to fully engage in CPPAs. Further liberalization of the market to allow corporate partnerships and private-to-private power deliveries will improve the power market design status.
Viet Nam	Moderate	Moderately conducive environment. The country presents 100% grid capacity coverage as well as numerous local and some international renewable energy technology providers able to invest in renewable energy locally. Liberalizing the power market to allow for CPPAs would, however, have a substantial impact on the uptake of renewable investments by international markets.
Indonesia	Moderate	Moderately conducive environment. The country presents 100% grid capacity coverage and a high potential to replace fossil fuel infrastructures with renewables through the deployment of more ambitious renewable energy policies and instruments. The liberalization of the power market to allow for CPPAs would need to be simultaneously deployed in order to have the most impact on the uptake of renewable investments by international markets.
Malaysia	Low	Current environment is considered not conducive for CPPAs unless key barriers are lifted. Policies opening the power market to higher levels of renewable energy, and liberalizing the single buyer market structure to allow private-to-private power delivery would be advised. Lifting current regulatory positions preventing the use of CPPAs is also needed.



## Contributors

### Michael Hayes

Global Head of Renewable Energy, KPMG

### Natalie Adomait

Managing Director, Investments, Brookfield Renewable

### Funke Adeosun

Vice-President, Energy Risk Engineer, Marsh

### Justine Roche

Growth Markets Programme Specialist, World Economic Forum

With thanks to the World Economic Forum Task Force on Mobilizing Investment for Clean Energy in Emerging and Developing Economies (MICEE) and to the Power Working Group of the CEO Climate Leaders.

For their comments and input, particular thanks go to Johan Bastin (DTEK), Johannes Bøggild (Orsted), Emily Farnworth (RE100), Roberto Ferrari (Engie), Markus Fischer (Orsted), Wafa Jafri (KPMG), Aleksandra Klassen (RE100), Amy Lahav (Jacobs), Elvira Lopez Prados (Acciona), Jason Mariyappan (Petronas), Henry McLoughlin (Capricorn), Espen Mehlum (World Economic Forum), Shiva Prashanth Kasina (NTPC), José Manuel Rodriguez (Iberdrola), Anna Seremet (Marsh), Anvesha Thakker (KPMG), Geoff Wright (Brookfield Renewable), Anoop Zacharia (KPMG).