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## **The role of marketplaces in development of electric power generation**

Much has been written about the role of long-term fixed-price contracts in fostering development of new power generation capacity. For decades, deregulated markets have allowed non-utility, or private, power producers to sell output at predictable prices under a variety of long-term agreements. More recently, over the past several years, many of those agreements have been made directly with commercial and industrial power users – both physically and financially. We and others have described these agreements (PPAs, VPPAs, revenue swaps and options) and their supporting role in financing power development globally in various papers (see <https://alphapoweradvisers.com>).

All of these agreements have been negotiated bilaterally, typically via a manual process of incorporating terms and conditions for the delivery of power, its volumes and timing, as well as cash settlement terms and conditions. Contract formats differ from firm to firm, project to project, depending on the wishes of one or both counterparties. They are lengthy documents requiring specific knowledge to navigate them.

There is significant interest in standardizing this process and creating contracts that are more readily able to be traded on an open marketplace. Through the work of several firms, mostly in the U.S. and Europe, these efforts are picking up steam. It is possible that within a couple of years, standardization will take hold and allow vast improvements in transparency by listing these contracts on open marketplaces. We discuss those efforts and their potential impact on development below.

## **A very brief history of bilateral commodity derivatives transactions**

PPAs are similar to other long-term, fixed-price contracts for the delivery of energy that have existed since the 1980s. The proliferation of contracts blossomed during the 1990s and early 2000s as more energy markets, especially natural gas, were deregulated throughout the world. Deregulation exposed more firms to commodity prices – in energy production, transportation, processing and consumption. Some chose to absorb the risk while others sought to shed a portion or all of it.

Public futures markets predate bilateral trading, but only by a decade or so, and those markets were deemed to be too rigid in their contract specifications (contract size, delivery location, and timing) to be of use to the rapidly-expanding universe of companies seeking to manage their exposure to specific energy prices. Indeed, until the early 2000s, there were still only a handful of listed energy futures contracts globally and the majority of companies' exposures were based in locations far from the delivery points of those contracts. Moreover, futures contracts require cash usage via margin payments (both initial and variation), which poses a significant hurdle to their adoption among non-financial firms.

Alternatively, bilateral agreements loosen those restrictions, allowing risk managers to define more precisely the parameters they are seeking to manage. Willing counterparties – mostly financial institutions – utilize their skills in portfolio management to absorb the more esoteric exposures of their clients and to manage them with a variety of financial tools – including the more rigid futures markets. Bilateral agreements also generally allow corporate risk managers to avoid cash usage by instituting credit lines with their counterparties. Those credit lines allow each side's position to suffer mark-to-market losses without requiring variation margin, typically up to a previously-agreed threshold.

Since the early 2000s, public futures exchanges and other online platforms have benefited from the profusion of these customized contracts in two distinct ways. First, by listing the more common ones on an electronic marketplace that incorporates the credit terms into the system; thus only allowing those companies with existing trading agreements amongst themselves to trade via the marketplace. InterContinental Exchange (ICE) led this market by developing oil, gas, and power contracts that companies could utilize to post bids and offers and only to execute with approved counterparties.

Second, in the wake of sizeable credit defaults (e.g. Enron, Lehman Brothers) that led to losses among trading counterparties, futures exchanges listed the very same contracts as had previously been traded only bilaterally, most often with all of their esoteric pricing and location attributes. The main benefit from migrating to public futures was the avoidance of credit exposure, even at the cost to all of having to post cash margin. These public contracts have continued to proliferate in recent years as new sources of energy are developed and spot-market trading takes hold at nearby ports and pipeline interconnections. There are now hundreds of energy contracts listed on ICE and similar exchanges.

## **PPAs following similar path**

Meanwhile, in the power market the development of new sources of generation has increased the need for price risk management and thus the development of PPAs and other such contracts. But those contracts are still traded almost exclusively like derivatives in the old-fashioned way: via bilateral negotiation between counterparties, most often with generous credit terms. The complexity of these agreements has kept them from migrating toward multilateral marketplaces and futures exchanges. As

such, their valuations remain opaque and suffer from poor liquidity since they combine market and credit risk, as well as physical delivery specifications. These agreements allow companies to hedge their risk, but often at significant cost relative to analogous futures in other energy markets.

There is an opportunity to vastly improve the transparency and ease of entering into long-term power contracts by utilizing electronic means. An important first step would be to follow the lead of marketplaces like ICE in the early 2000s: listing bilateral contracts on a platform for participants to see and to transact with approved counterparties. Such platforms exist today, but still largely in infancy and in need of significant development.

How can the market transition meaningfully in the years ahead? Such is the focus of this brief paper, in which we summarize some of the efforts being made by various participants. We acknowledge that the development of a modern, transparent market for PPAs will take time and effort among developers and buyers, and will require some changes in preferences, away from the specific and toward the more general. Doing so will lower transaction costs while increasing residual risks for participants.

Whether such a tradeoff provides value to various participants will dictate how the markets develop. It is possible that the risks associated with more uniform contracts may prove too significant for many participants to move away from their current highly-customized and flexible model. But market developers have proven adept at incorporating various bells and whistles into their systems in order to keep contracts from becoming too homogenized while still allowing them to share enough common features for easier comparison and, ultimately, more transparent price discovery.

### **Leading the charge: Technology companies focused on market transparency**

Those with the most at stake are often the least able to force change on an industry. Generation asset developers and power consumers, including utilities, that are the main participants in the PPA market are not in the business of developing online trading tools. They build projects, manufacture goods, and transmit energy. They may embrace technological change every day, but they aren't in the position to foster a new mechanism for buying and selling long-term power contracts. Others are in a better position to do that.

Foremost among these are technology firms that may have built online trading systems in other markets and have the ability to apply those platforms to new asset classes such as PPAs. **TruMarx Data Partners'** **COMET** platform is an existing marketplace of bilateral contracts that includes other energy commodities (e.g. LNG) that is being geared toward the PPA market. COMET has an existing base of commercial and industrial customers that typically buy physical commodities on its platform but that can also transact financially-settled ones. A key element is COMET's ability to interface with other aspects of the enterprise's trade management platform, including corresponding documentation, risk systems, and back office. In this regard, COMET is more embedded with their customers' back offices than its competitors.

COMET's inclusion of PPA/VPPA products can be viewed as a natural choice for bringing together buyers and sellers on a platform that already includes many of the energy-intensive companies that will eventually enter into PPAs.

Not all companies in this space have existing marketplaces for other energy products. **LevelTen** commenced operations three years ago with a clear focus on improving transparency and market liquidity in corporate PPAs by bringing together sellers and buyers of long-term contracts on their online platform. Transaction data are not publicly available due to confidentiality agreements with their platform users, but in aggregate they have contracted nearly \$2 billion of notional volume to date and are in the process of expanding outside of North America into Europe.

Regardless of transaction volumes, LevelTen's platform also serves as a market information enhancement. Buyers and sellers can post their interests according to location, tenor, and other relevant attributes (the company reports more than 3,000 PPA price offers). This process facilitates automation among RFPs, an otherwise highly manual negotiation, that should, ultimately, contribute to more vigorous trading. Lastly, with the data they acquire from developers and generators, Level10 is able to publish frequently updated performance metrics – how a particular asset is generating, its production credits, pricing, etc. – that can be utilized within a broader risk management analysis.

**Direct Swap** is a new platform that is being developed as a broader marketplace for bilateral commodity derivatives but which has potential to list PPAs and VPPAs alongside swaps and derivatives on oil and gas in a companion business. Direct Swap doesn't have an existing stable of power companies to list their interests, nor does it have an in-house collection of industrial and commercial power users. But it has the advantage of being a commodities technology company with experience launching other marketplaces, and may create synergy between its physical and derivatives power marketplaces.

**InterContinental Exchange (ICE)** is the most experienced provider as a bilateral marketplace. As mentioned above, ICE has since moved much more aggressively into listed markets, in commodities and other asset classes including equities. ICE has been at the forefront of exchanges listing previously-bilateral contracts on their public platform.

ICE currently has a commanding lead in futures trading at the main trading hubs in the Northeast and Texas, dwarfing its main competitor (CME). It also offers trading on a wide array of locations in the U.S. ICE has not made public any plans to attract the PPA market onto its system, although doing so would be a natural extension of their development over time.

**Bloomberg** is an information services company specializing in data and analytics. But it also offers execution capability via its Tradebook platform, which routes orders on futures, options, and fixed income to various liquidity pools. Tradebook isn't a regulated exchange like ICE, but rather an execution channel for accessing liquidity on various exchanges.

Bloomberg also offers an excellent research product (Bloomberg New Energy Finance, or BNEF) that collects, analyzes, and disseminates data on various aspects of the power market, including PPAs and VPPAs. Their forecasts are widely quoted among market analysts.

Notwithstanding its role in market information and execution in other asset classes, Bloomberg doesn't offer a marketplace for PPAs. And, like ICE, hasn't announced any such plans.

**EEX/Nodal Exchange** is a public futures market providing cleared trading on a variety of basis locations (nodes) throughout North America and Europe, as well as emission credits and commodity contracts in other energy markets. Nodal Exchange, which covers North America, list contracts several years into the

future that may be utilized by PPA offtakers to hedge a portion of the location risk they absorb from developers and generators.

Some developers with trading capability may also be using these and other public futures markets to hedge portions of their price risk. But those that do not have trading capability and depend on others to provide price protection tend to favor the financial flexibility of bilateral contracts like PPAs and VPPAs. Presently, there is no bilateral trading offered on Nodal Exchange.

**DNV.GL** is an advisor to the power industry that provides a similar role as Level10 via its Veracity product line, but focused on Europe. They maintain a database of development projects and associated offtake opportunities for a variety of buyers. Access to the database, known as Instatrue, provides users with enhanced understanding of forward market values on which they can make better decisions. This applies to both power generators and consumers.

Nevertheless, Instatrue is not an open marketplace between sellers and buyers and doesn't offer any ability to transact. Its information could prove useful as a screening filter to a market that matches buyers and sellers, but the actual trading would have to occur elsewhere.

**Pexapark** provides advisory services as well, focusing on Europe. Their main contribution to market transparency is in their database of existing PPAs, by country, that they make available to clients. They also offer their clients the ability to screen counterparties, according to various criteria via a proprietary platform. This is similar to DNV.GL's offering and, likewise, is not meant as a marketplace.

### **Other potential participants**

Aside from the companies outlined above, there are several others that are in the business of advising clients on PPA valuations. Most of these are heavily data-driven in their product offerings, providing either their own proprietary model valuations or those of independent third parties. These companies add value to the process by advising their customers on whether valuations for a particular tenor and region are in line with broader trends or perhaps unusually cheap or dear. In this sense, they are adding transparency even though their valuations are only known to their direct clientele.

Like the clients they serve, these advisers are not in the business of setting up and maintaining marketplaces for contracts like PPAs. They would welcome the opportunity to utilize such an offering as it would make their jobs easier to be able to attribute valuations more readily to actual, traded volumes. But they aren't likely to be the ones creating such a platform.

Larger consultants offer other technical power-related solutions, not to mention a wide range of equipment. Some of these firms are among the most widely-utilized for advising on long-term power agreements, valuations, etc. But such service companies are typically not sufficiently familiar with the operations of marketplaces to consider it their role to start a multilateral trading platform. As with the smaller, more focused advisers with whom they compete in valuing PPAs and advising their clients, they would likely appreciate the benefits that a truly open marketplace would provide. But they are unlikely to be the ones to host it.

## **The future is almost here**

Existing online PPA platforms like Level10 are still in the early stages of utilization and other potential providers are still in development. There is a clear need for more uniformity in the market that will only come about via more robust central repositories of information. But the existence alone of such repositories, while necessary, isn't sufficient for the more profound development – actual trading – that can only happen when all interested parties see the benefits of a more open price-discovery forum.

The current stage of market development is similar to that of a new asset resource that ramps up in a particular location (e.g. Permian oil and gas development). There is often an immediate interest in developing a forward market for those with exposure to the new asset to hedge. But before that forward market can develop there are certain requirements that must be satisfied — among them the creation of a truly multilateral cash, or spot, market. There can be no forward market where a variety of actors doesn't already trade physical material on a recognized spot-market index.

Similarly, for a truly multilateral PPA forward market to develop, there needs to be confidence that the indexes being traded are sufficiently trustworthy, transparent and liquid. This is the task of the risk-management advisor, to bring about that degree of confidence in valuations, and to support the efforts of the technology companies providing the platforms.

These markets will develop in time. The need for additional power resources will assure that financing flows into those projects where commodity prices can be properly managed. Advisers will support the most competitive forms of open exchange to achieve price certainty and should be fostering all information channels that support that cause. As confidence in those information channels improves, it's only natural that they will develop into open marketplaces.