WHAT ARE COMPETITIVE PROCUREMENT & REVERSE AUCTIONS?

Competitive procurement is not unique to the energy sector, and is simply defined as a method for purchasing a product or service through an open and competitive process with multiple bidders. In the electricity sector, competitive procurement refers to the purchase of an energy or capacity product through a competitive tender process. Instituting this competitive framework is central to the development of a low-cost and high-renewable electricity sector because it provides a vehicle for tendering projects transparently, as opposed to on a bilateral or negotiated basis, builds investor confidence in the system, and fosters renewable energy growth.

Promoting competitive procurement of renewable energy allows USAID to rapidly scale clean energy at low prices, contributing to both climate change and economic development goals. This process can help to reduce harmful greenhouse gas emissions and bring cleaner sources of energy to the communities we serve. Recent examples of competitive procurement, especially in the form of a reverse auction, have resulted in global prices that are strikingly lower than historical prices, and higher capacity factors for constructed plants. These cheaper prices also permit cash-strapped utilities and ultimately the consumer to pay less for electricity supplied by renewable energy, which increases the appetite for utilities and the public to purchase more renewable power.

Reverse auctions are a type of competitive procurement in which the lowest price wins, as opposed to a silent auction where prices are bid up. Generally, the regulator conducts a process of pre-qualification prior to the auction to select preferred bidders. The regulator sets a certain level of capacity and/or energy that is needed at a certain price, and fills the capacity until that level is met. Auctions can be structured into multi-round programs, where each successive round establishes more confidence and pushes prices lower. The process can be used for any energy source or even for all sources at once (technology-neutral) and usually includes the use of an electronic bidding platform. Reverse auctions have resulted in low prices for solar and wind plants in Mexico (2.69 cents/kWh), Chile (2.91 cents/kWh), Zambia (6.02 cents/kWh), and United Arab Emirates (2.99 cents/kWh) over the past six months, often at prices comparable to natural gas.

Competitive procurement acts as price discovery for renewable energy plants. Market costs have fallen faster than government energy planners have been able to capture in traditional renewable energy incentive programs such as feed-in tariffs (FITs), and the process allows private sector actors to bid a plant price based on the actual costs of doing business. In Brazil, India and South Africa, the global heavyweights when it comes to renewable energy auctions, the introduction of competition led to immediate average price cut of 29-50%. Even in more developed countries, where government capacity to set prices is quite high, the introduction of auctions has led to a decrease in FITs. As additional auction rounds are conducted, the clearing prices of auctions have moved with the ups and downs of the economy, the energy sector, and renewable energy project development process in these countries. For example, after an initial 50% cut to prices when auctions were first instituted, prices in Brazil have moved in both directions, reflecting the market realities in the country, and facilitating the development of 1.3 GW of onshore wind capacity.
Reverse auctions require that government agencies devote resources for engaging in advance planning and consultation. At a high-level, they require that key stakeholders come together to institute the requisite technical, legal, and regulatory processes prior to auction rollout. Ensuring that adequate transmission is available to interconnect new projects and that the electrical grid is ready to integrate variable renewable sources are essential to achieving successful auctions. At a more granular level, stakeholders should develop a consensus around the goals they would like to achieve and how these goals will be reflected in auction design. Pre-auction planning including site selection, grid connection plans, environmental impact studies, resource studies, as well as standardized power purchase and interconnection agreements, can all smooth the path forward.

Energy stakeholders must also reflect upon the level of competition and capacity targets that are appropriate to the local country context. While mature markets should have auctions determined on price only, emerging markets can also focus on creating the supply chain, such as through realistic local content rules, evenly spaced auction timelines to allow for local industry development, and strategic capacity targets. In the cases of markets where there is not a prior track record of competition, this may mean starting small to boost competition before downward price pressure sets in, as in South Africa’s first auctions. As the industry matured, capacity targets could simultaneously increase.

While prices tend to be higher where utility creditworthiness is a significant challenge, tools exist to address market risk, such as guarantees and capital grants, to garner more competition. Measures can be taken to increase likelihood of financial close and project delivery, such as project bond requirements to minimize risk of non-completion and lowball bidding, pre-qualification of bidders, availability of concessional financing, site-specific resource measurements, guidelines on equipment, and capacity factor requirements.

GLOBAL TRENDS

Auctions have traditionally not played a large role in renewable capacity addition but since 2012, the level of auction uptake has been rising. Brazil, China, South Africa, and Peru have been the global leaders in auctions since 2000. These countries have procured 12 GW, 8 GW, 5 GW, and 3 GW of RE respectively through auctions. A major shift towards auctions will take place when the EU makes competitive mechanisms mandatory in 2017. If the EU, China, and Japan follow through, then more than half of clean energy capacity additions will take place through auction policies.
Reverse auctions are not infallible and must be tailored for different market conditions. Nonetheless, introducing some level of competition and transparency into the bidding process for energy contracts should be considered as one of the foundations for achieving a mature energy sector.

There is a significant range in the level of competition employed worldwide. Competition levels vary from onetime tenders which are normally sealed bid but do not necessarily use price as the determining factor. These tenders tend to take longer. A true auction employs multiple, pre-scheduled rounds and uses price as the determining factor to award energy or capacity contracts to pre-qualified bidders. True auctions employ electronic bidding, a transparent process, and prices are lower and deals concluded faster. This latter type of mechanism is an ideal goal for countries to move towards. The sealed bid auction with pay-as-bid clearing mechanism is becoming the dominant model globally except for Brazil which has its own unique descending clock mechanism.

Perhaps the most exciting development is the evidence showing that low bid prices are not specific to developed countries, but that low bid prices can be replicated worldwide. Although the data does not necessarily reflect this trend for wind, a more mature technology, the evidence for solar suggests a high correlation between price and auctions in the 16 markets surveyed, comprising 13.5 GW of solar capacity. In addition, there is no indication that project development is suffering from the move to competitive procurement. Bloomberg New Energy Finance data shows that the projects that were procured through auctions were commissioned at a faster rate than those that were not, at 41% commissioned versus 27% commissioned for 33 GW of global PV capacity in 2013.

The companies that have played the major roles in auctions to date tend to be larger, more established companies with the power to manufacture or source large supply orders at low cost. Italy’s leading electricity and gas operator, Enel, has so far won nearly 11% of all auction capacity tendered worldwide, followed by Brazilian, South African, and Chinese companies that are pure domestic players. This suggests that domestic players do not necessarily suffer under auction systems, although this could depend on the maturity of the domestic market holding the auction. For example, there were no domestic pre-qualified bids in Zambia, but the Zambian government is expected to take a 20% share in the two winning project companies. Engie, Actis, EDF, and Total are also significant players in global auctions.

COUNTRY CASE STUDIES WHERE AUCTIONS TARGETED > 1,000 MW/ROUND

Mexico - Lowest price: 2.69 cents/kWh
Mexico has now held two successful reverse auctions in the past year, in April and September. Each of the auctions brought in several billion dollars in planned investment. Following previous support in implementing the legal and regulatory framework for Mexico’s electricity sector reform, USAID’s Mexico Low Emissions Development (MLED) project provided critical assistance towards the successful performance of this auction through collaborating with Mexico’s energy ministry (SENER), regulator (CRE), market operator (CENACE), and major utility (CFE). MLED also assisted in the development and revision of the auction rules and timelines.

Figure 2: Global auction prices (constant 2015 $/MWh) and allocated capacity (bubbles, GW) for onshore wind and solar PV, 2002-16 (Source: BNEF)
and the institution of the electronic software platform, as well as in helping to process hundreds of offers from companies prior to pre-qualification. The total cost of this assistance was under half a million dollars.

The auction attracted international attention because of the low prices obtained, and the large winning participation of solar, which until then did not participate significantly in the country’s power sector. In addition to energy and capacity auctions, the Mexico auction included Clean Energy Certificates (CELS in Spanish) which were offered as a product for meeting the utility’s renewable energy target compliance requirement of 35% clean energy by 2024.

The first auction helped the Mexican government attract the interest and confidence of foreign investors, and will enable Mexico to install 2,085 MW of new, clean electrical power. Solar projects accounted for 75% of the winners and 25% were wind. The lowest solar bid was for $3.55/kWh. All the PPAs were dollar-denominated and 15 years in length. Enel Greenpower, Sunpower, and Jinko Solar were the three largest winners in this first auction.

In the second auction, USAID provided continued support, including improving the auction platform’s software and services. Auction results showed that 9.3 TWh and 8.9 million CELs were awarded to solar, wind, geothermal, and hydroelectric projects, with solar comprising about 54% of the winning projects in energy. The results represent about $4 billion of new investment and almost 3,000 MW of total installed generation capacity. The median price of energy and CELs was $3.35/kWh with the lowest solar bid was exceptionally low at $2.7/kWh. Mexico’s third auction is scheduled for April 2017.

Mexico is an excellent example of how USAID was able to provide limited, targeted support in an advanced market to enhance the quality of auctions and leverage billions of private sector investment.

**Chile - Lowest price: 2.91 cents/kWh**

Chile is the latest in a series of auctions that have scored the title of “lowest solar price ever.” The auction’s weighted average price was almost 70% lower than the previous auction. The auction was so competitive that incumbent players like Engie did not win contracts. Although auction prices for wind looked within the range of wind prices in Latin America, the only solar project to win was a Solarpack Chile 122MW project at $2.91/kWh. In response, former President Al Gore tweeted that the auction was proof that “climate action continues to make sense.”

![Figure 3: Recent Latin American Solar and Wind Auction Results by Source, Generation, and Price (Source: BNEF)](image)

Although Chile has excellent solar irradiation, the prices have been questioned as too ambitious. It is thought that investors are betting on new transmission, which is in the process of being built, that will interconnect the central and northern national grids and make electricity easier to wheel. One additional factor is that only one of five companies that won contracts at an earlier auction in 2015 will be ready to supply electricity on time. Mainstream, which is also one of the biggest winners in this year’s auction, has said that it plans to start building its 2015 contracted plans next month, a few months behind schedule. It is too early to tell whether or not the companies who won this year will deliver electricity on time and meet the country’s high expectations for renewables.

**COUNTRY CASE STUDIES WHERE AUCTIONS TARGETED < 1,000 MW/ROUND & WHERE CONCESSIONAL FINANCING SUPPORTED LOW PRICES**

**Zambia- Lowest price: 6.02 cents/kWh**

When the International Finance Corporation (IFC) jumped into the auction landscape with the rollout of its Scaling Solar program in Zambia in April 2016, it made a splash with the lowest prices received for...
solar in Africa, the lowest bid at 6.02 cents/kWh and the other winning bid at 7.84 cents/kWh for 100 MW total. The winners were large and well-established companies First Solar (U.S.) and Enel (Italy). French, British, Chinese, and local Zambian companies also participated. Zambia plans to bid out 500 more MW of PV in subsequent phases.

Scaling Solar is supported by a $6 million Power Africa grant covering Zambia, Senegal, Madagascar, and Ethiopia. In Zambia, Power Africa funded the $2 million success fee due to the Government of Zambia from the two winning bidders. For other auctions performed by Scaling Solar and funded by Power Africa, USAID Missions can choose to fund the activities they believe will have the most significant development impact. Besides success fees, possibilities include other pre-development activities such as legal consultants, technical studies, environmental studies, social studies (such as World Bank resettlement plans), and other options.

The low prices, especially in an African market, shocked many in the energy industry, but becomes less surprising when the derisking package that Scaling Solar offers is better understood. IFC’s Scaling Solar package includes a standardized tendering process, templates for key documents, and competitive financing and insurance.

![Figure 4: Sensitivity of project levelized cost of electricity to assumptions (Source: BNEF)](image)

As shown in Figure 4, the levelized cost of electricity is most sensitive to capacity, followed by capex and cost of debt. In order to make these projects commercially viable, the World Bank offered concessional lending. BNEF suggested that the World Bank’s involvement brings down the cost of debt to 6% and the cost of equity to 10%. The PPAs are already denominated in dollars which reduces currency risk for investors.

Zambia’s auction differs notably from those in Latin America and India regarding the role of private capital. The only lenders including syndicates for these projects have been concessional lenders and commercial banks did not fund the winners. However, as this is the first time a competitive auction has been held in Zambia, this could be the appropriate time to employ such derisking tools in order to increase interest in the nascent market, thereby helping to decrease prices. Additional work is needed to determine how best to offer additional forms of revenue or concessional financing in a transparent and timely manner for the benefit of auction participants worldwide.

**Afghanistan- Lowest price: 7.3 cents/kWh**

USAID recently teamed up with the Afghanistan Electric Utility, Da Afghanistan Breshna Sherkat (DABS), to structure a competitive procurement to attract the first independent power project (IPP) in Afghanistan. This 10 MWp solar plant in Kandahar province is meant to be a replicable model for the Afghan government as it transitions towards the private sector taking the lead in building and operating new power plants. USAID and DABS used an auction procurement method to ensure the most cost-competitive tariff was realized. This was the first time an auction had taken place in Afghanistan, and it resulted in a final price of less than 8 cents/kWh for the solar power. USAID provided a $10 million grant in the form of a construction contract for the winning bidder and we are examining the most efficient manner to structure incentives for future projects. This project will contribute to the reduction of Afghanistan’s dependence on diesel generation, improve energy security, and reduce the price of electricity generation for Kandahari homes and businesses.

**USAID’S REVERSE AUCTION SUPPORT**

USAID has provided support for reverse auctions through our bilateral energy programs and a variety of USAID/Washington mechanisms. Auctions recently conducted in Mexico, El Salvador, Zambia and Afghanistan have all benefited from some type of USAID support.
In July, Power Africa through the U.S. Energy Association (USEA) conducted a 4-day workshop in Tanzania with participation from the Ministry of Energy and Minerals and nine other government agencies. USEA also commissioned a short assessment assessing the readiness for auctions in country prior to the workshop which included interviews with major energy stakeholders. In October, USAID will support USEA to organize an auction workshop in Kazakhstan. These workshops are generally 2-day events for major country stakeholders in the energy sector in which USAID recruits experts to speak on past renewable energy experience and introduces the basic legal, financial, and regulatory processes for undertaking an auction. The exercise generally concludes with the creation of an action plan for performing an auction.

Mechanisms for supporting host country’s efforts to implement competitive procurement programs exist through the Energy Division in Washington, as well as through Power Africa.

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This Technical Note is the first in an upcoming series of Technical Notes, prepared by the USAID Energy Division to keep Mission and Bureau staff abreast of current knowledge and trends in the energy sector.

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**BIBLIOGRAPHY**


