





# SOLD! USING AUCTIONS TO UNLOCK CAPITAL MARKETS FOR CLIMATE ACTION

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## THE CHALLENGE: HOW TO REDUCE GHG EMISSIONS AT THE LOWEST COST

With the Paris Climate Accord in 2015, the global community committed itself to limiting average global temperatures to 2°C above pre-industrial levels. Reducing Greenhouse Gas (GHG) emissions and transitioning to low-carbon economies will be crucial to meeting this goal. The costs, however, are high and public funds are limited.

One way to drive GHG emission reductions is through a “carbon market,” which provides a market-based financial incentive for private-sector entities to reduce carbon emissions. The collapse of carbon prices has removed the incentive for private-sector investment in clean technology projects, however, as a consequence, many GHG emissions abatement projects, such as emission-reduction projects at landfills and agricultural, and wastewater treatment sites, are at risk of being decommissioned. This is true even though many of these projects would require little additional funding to continue operating.

The World Bank’s Pilot Auction Facility for Methane and Climate Change Mitigation (“PAF”) was established to test an innovative financing approach and the use of auctions for GHG abatement. The PAF offers a price guarantee to projects that reduce GHG emissions. The public funds used for this guarantee are allocated through an auction that selects entities that require the least additional funding per ton of carbon dioxide equivalent (tCO<sub>2</sub>e).

Three auctions were held under the PAF, and over \$50 million was committed to support these price guarantees. NERA Economic Consulting (NERA) developed the detailed auction rules and managed the auctions held under the PAF<sup>1</sup>.

## INNOVATIVE USE OF AUCTIONS

The PAF features a pay-for-performance mechanism that takes advantage of existing infrastructure to deliver a price guarantee to entities that have the potential to deliver future emissions reductions. The mechanism is supported by donor funding from the governments of Germany, Sweden, Switzerland, and the United States.

The PAF consists of two key elements. The first is a tradable put option for emission reductions. The option is structured as a zero-coupon puttable bond issued by the World Bank Group through the International Bank for Reconstruction and Development. Upon maturity, the put options give the holder the right, but not the obligation, to deliver qualifying Emission Reductions (ERs) to the PAF in return for receiving a payment. An ER is a type of carbon credit that represents the successful emissions reduction equivalent to one tCO<sub>2</sub>e. The payment received is the strike price of the option and the premium is the price paid for the option. The payment less the price paid locks in an effective guaranteed floor value for ERs.

The holder of the option may still sell its ERs in the open market if a better price is available. Optionality is crucial as it allows the

<sup>1</sup> To learn more, visit <http://www.pilotauctionfacility.org/>

holder of the put option to benefit if carbon prices in international markets rise above the strike price. Here, the PAF will have achieved its objective – stimulating private-sector investment – at no cost, given that payment will not be made if the holder does not exercise its put option. If carbon prices in international markets fall, the holder of the put option has the right to sell its ERs to the PAF at the strike price. Either way, the price guarantee will have incentivized private investors to fund abatement projects.

The PAF's second key element is the use of an auction to effectively allocate put options to entities that would require the least additional funding to deliver ERs. Bidders compete in the auction to purchase these put options, and the auction sets a uniform guaranteed floor value for each ER. The floor value can be determined either by fixing the option's premium and allowing bidders to bid down the option's strike price, or alternatively by fixing the option's strike price and allowing bidders to bid up the option's premium. Either way, the auction transparently determines the value of the put option and selects the entities willing to pay the most for the option (or, equivalently, to receive the least in terms of price guarantee to deliver the ERs). Thus, the competitive nature of the auction maximizes the impact of public funds and achieves the greatest climate benefits per dollar.

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## CRITICAL SUCCESS ELEMENTS

Bidders around the world participated in the PAF auctions, and 24 firms were selected as winners. More than \$50 million was allocated, with potential reductions of over 20 million tCO<sub>2</sub>e by 2020. A number of best practices are responsible for the program's success.

### FOCUS ON WHERE IMPACT IS GREATEST

The PAF focused on reducing methane emissions at the program's inception and has expanded to target nitrous oxide emission reductions in its third auction. Both methane and nitrous oxide are highly potent greenhouse gases with a global warming potential of 25 and 300 times that of carbon dioxide, respectively. Thus, the reduction of one ton of methane is equivalent to 25 tons of carbon dioxide and the reduction of one ton of nitrous oxide is equivalent to 300 tons of carbon dioxide.

Due to the low price of carbon credits, 1,200 methane projects in developing countries were identified as being at risk of decommission. The Methane Finance Study Group estimated that, across all developing countries, methane projects could reduce as much as 8,200 million tCO<sub>2</sub>e at less than \$10 per ton in incremental cost financing.

### PAY FOR PERFORMANCE

The PAF pay-for-performance mechanism delivers funding only upon achievement of pre-defined and verified emission reductions. This program does not pay for the installation of the underlying abatement projects, but pays for the performance of such projects. The PAF thus does not assume the risk of project implementation, which remains with the developer.

## LEVERAGE EXISTING INFRASTRUCTURE

The program leverages existing infrastructure in two main ways. Firstly, the World Bank uses its established infrastructure to issue zero-coupon puttable bonds that are equivalent to put options. These bonds are tradable, and parties may buy and sell the bonds on the same markets as traditional World Bank bonds. This reduces implementation costs and enables winning bidders to transfer ownership, which maximizes the likelihood of achieving emission reductions. Second, the holder of the put option surrenders its ERs before payment is made by the PAF. The PAF leverages the Clean Development Mechanism (or CDM), the Verified Carbon Standard (or VCS) and the Gold Standard infrastructures in place to implement this.

## MAXIMIZE IMPACT OF PUBLIC FUNDS

The PAF makes use of a clock auction format, a novel approach in international climate and development finance. A clock auction proceeds in a series of rounds. In a round, bidders state how many put options they are willing to buy, given the option's premium and strike price. If bidders in aggregate are willing to purchase more than the number of options available, the economic proposition of the options is made less attractive in the next round (by increasing the option's premium or reducing the option's strike price), and bidders have another opportunity to state how many options they are willing to buy. This process continues until there are just enough options available to satisfy demand.

This competition drives down the effective guaranteed floor value (the strike price less the premium) for ERs to ensure that public funds achieve the maximum impact by selecting winners with the lowest expected costs per tCO<sub>2</sub>e. The two auctions that targeted methane emissions, which employed different auction formats held nearly a year apart, delivered virtually the same net value (\$2.10 per ER in the first auction and \$2.09 per ER in the second). This suggests the reliability of the price signal delivered by the auctions, and that the auctions were effective in encouraging straightforward bidding and in achieving a market-reflective price.<sup>2</sup>

## SUMMARY

The auctions under the PAF were successfully held in specific sectors, but could also be used in others. On a country level, the model could be used by governments that need to meet commitments under the Paris Climate Accord. On the global level, the auction format could be scaled with increased funding for larger multi-country climate auctions.

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<sup>2</sup> The third auction's net value was \$1.80 per ER. Details of the first two auctions are available here: <https://www.pilotauctionfacility.org/content/report-lessons-learned-auctions-1-2>