# Motivating Private Sector Action through Climate Auctions


PILOT AUCTION FACILITY

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# The Competitors

- Who they are: 15 teams
- What they own: a different amount of chocolates
- How teams are different: one team may like chocolate more or less than another
- How teams are the same: each team has a price at which it is willing to sell some or all chocolates – the more a team likes chocolate, the higher that price will be

# The Conflict

- The PAF has a budget of US $10.00 to buy chocolates
- The PAF wants to buy as many chocolate as it can with this budget – the PAF is seeking to buy chocolates at the lowest possible price
- The teams want to sell their chocolates at the highest price possible – certainly no lower than the price that reflects how much they like chocolates, and higher than this price if possible

**Think about what that price is for you!**

# The Competition

## First round

- The PAF names the highest price it is willing to pay for chocolates. At high prices, the PAF can only buy a few chocolates, whereas at lower prices, it can buy more chocolates.

- Each team states how many chocolates it is willing to sell at that high price – this can be all its chocolates, a portion, or none.

- If the PAF does not have enough budget to pay for all the chocolate offered by the teams, the PAF will lower the price in the next round
  - We Expect: [Price x Total Quantity Offered > PAF'S $10.00 Budget]

# The Competition

## Second and subsequent rounds

- Again each team will state how many chocolates it is willing to sell at the new, lower price – it can be the same amount as in the previous round or a lower amount – it cannot be a higher amount

- Rounds continue if the total number of chocolates bidders offer to sell multiplied by that round's price **exceeds** the PAF's US$10.00 budget

… the competition ends when the total number of chocolates bidders offer to sell multiplied by that round's price **no longer exceeds** the PAF's US$10.00 budget

**Ready? Let's bid!**
**You can win cash for your chocolates!**

# Real-time update while auction is ongoing

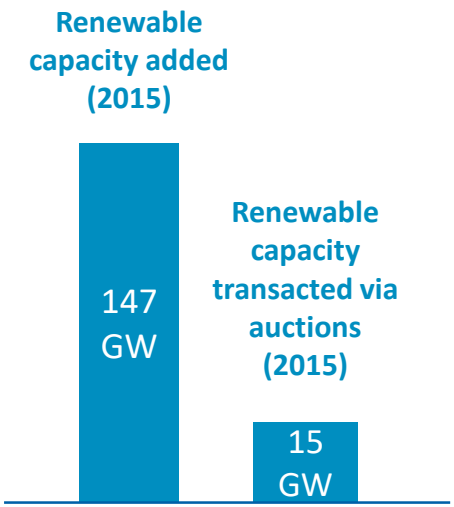
| | | | |
|---|---|---|---|
| Round Number | 1 | | |
| Fixed Budget | $10.00 | Going Price | $1.00 |
| PAF Quantity<br>**Fixed Budget ÷ Going Price** | 10 | Bidder Supply | |

# Overview of Climate Auctions

# Auctions to address climate goals

## Renewable Energy

~67 countries have used auctions for renewable energy contracts (2016), up from 6 (2005)




## Emission Reductions

# Pilot Auction Facility

**Challenge:**

- 2010: Carbon credit prices collapsed, stranding methane abatement projects

**Opportunity:**

Methane Finance Study Group:

- 1,200 new methane mitigation projects were initiated, but not implemented, under carbon offset standards in developing countries, representing at least 850 Mt of CO2e in emission reductions over the period 2013 – 2020
- Abatement possible at < $10/tCO2e

**Goal:**

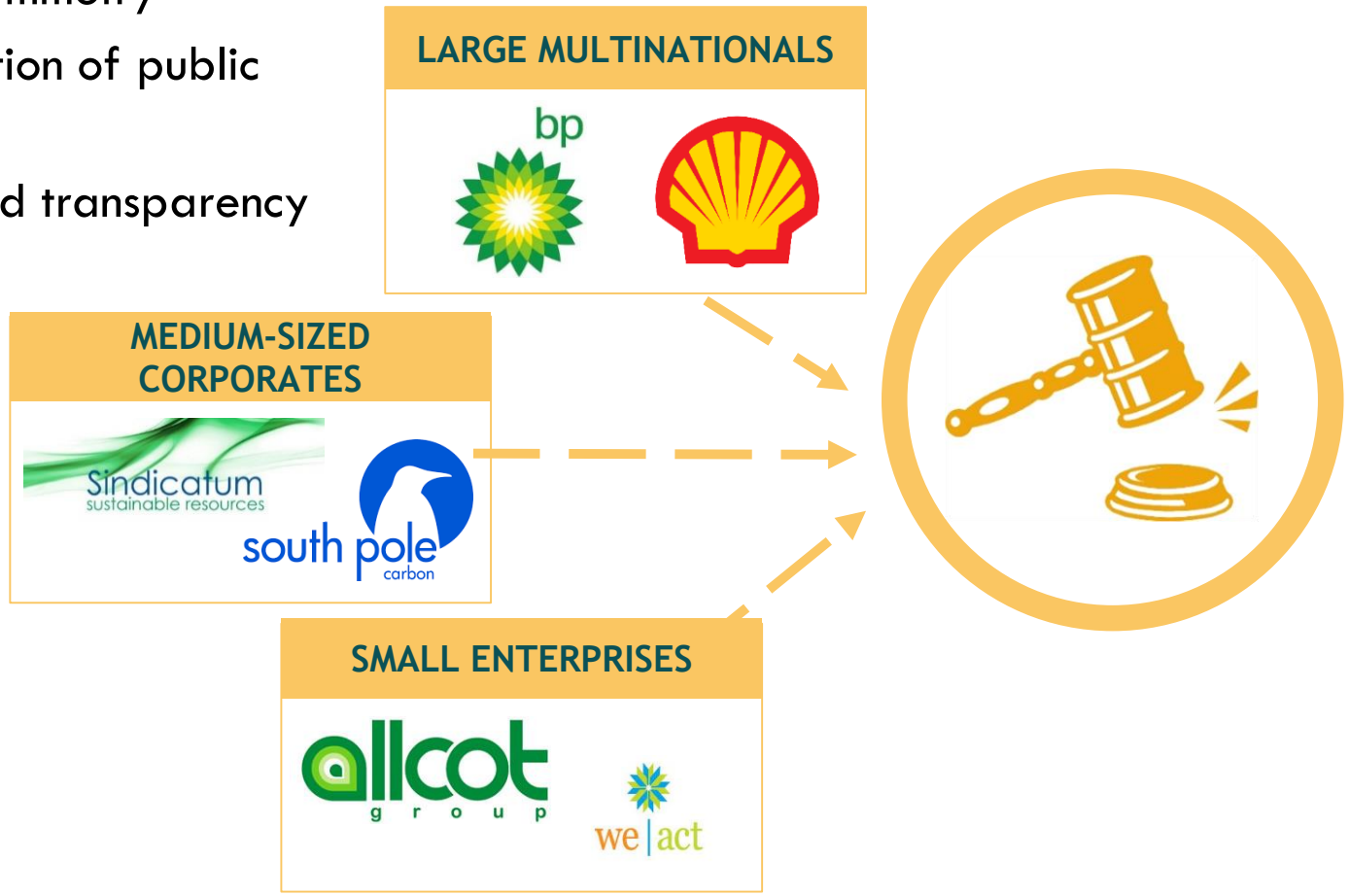
- Incentivize cost-effective private sector action to achieve methane abatement through a result-based finance mechanism

**PAF formation:**

- Germany, Sweden, Switzerland, and the United States, contributed $53 million in total resources to pilot climate auctions

# Why Auctions?

- Price volatility and discovery
- Information asymmetry
- Efficient allocation of public resources
- Competition and transparency

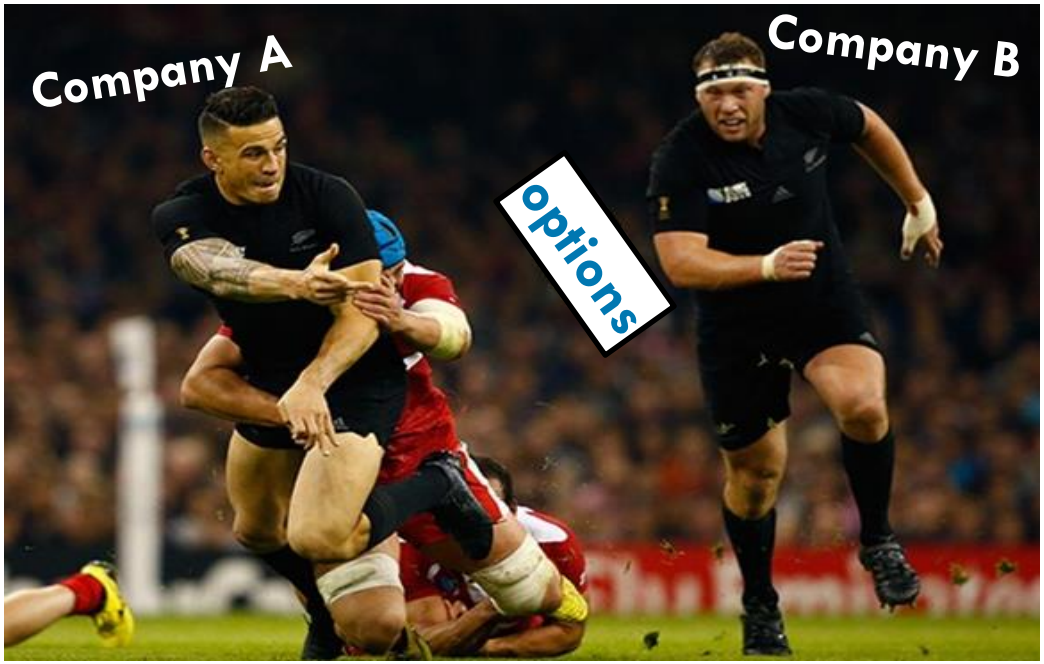


# Price Guarantees, Delivered through Auctions

- The PAF offers "put options" to guarantee a price floor for future climate results
- The options offer the right, but not the obligation, to deliver climate results to the facility at a guaranteed future price
- Bidders compete on the price at which they are willing to deliver eligible results to the facility in the future
- The bidders that offer to deliver results at the lowest cost win the auction

# Payment for Results, Risk Sharing

- Option owners are only paid for independently verified results according to eligibility criteria established before the auction
- Auction winners purchase put options by paying an "option premium" price
- The options are tradable; if an option owner cannot deliver eligible results, it can sell its options to another person/company



## The Simulation

- Bidders sell chocolate
- Bidders get paid cash today for their chocolate
- Winning bidders must sell their chocolate to the PAF

## Climate Auctions

- Bidders sell carbon credits
- Bidders get paid in the future only if they deliver carbon credits
- Winners purchase contracts by paying a premium, giving them the right to sell carbon credits
- Winning bidders have the option but not the obligation to sell their emission reductions to the PAF

# Step-by-Step Process

## Pre-Auction

Contributors Fund Facility

Set Criteria

Publicize Auction

## Example: Bidder Perspective

Apply

Qualify for Auction

Auction

Purchase Contracts

Source ERs

Audits

Deliver Credits

Payout 1

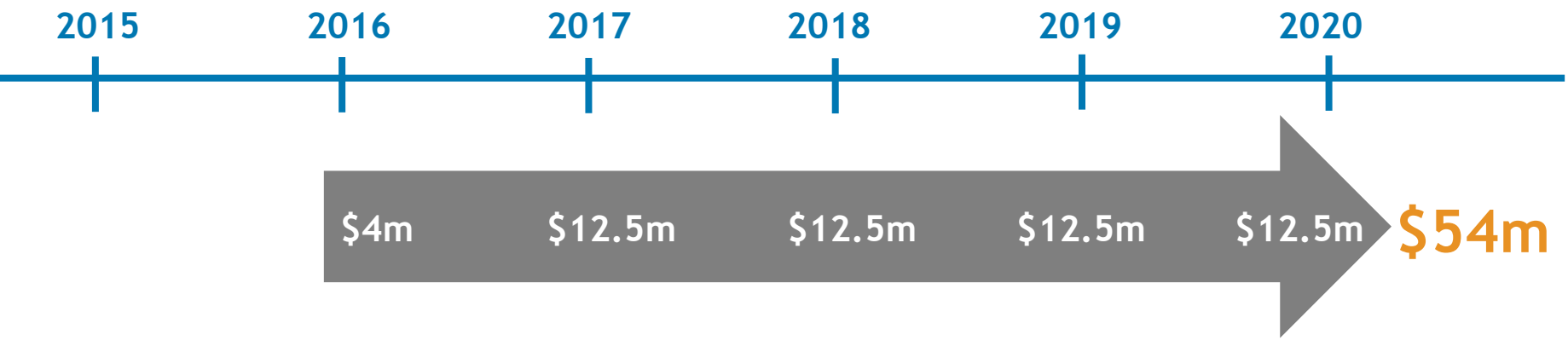
Payouts 2 – 4 (or 5)

# PAF Auction Results

**Auction 3: Nitrous Oxide (January 2017)**

**Auction 2: Methane (May 2016)**

**Auction 1: Methane (July 2015)**



# PAF Auction Results

*Results of the pilot phase demonstrate low-cost mitigation potential*

| | Auction 1<br>July 2015 | Auction 2<br>May 2016 | Auction 3<br>January 2017 | Totals |
|---|---|---|---|---|
| Strike Price ($/tCO$_2$e) | $2.40 | $3.50 | $2.10 | |
| Premium Price ($/tCO$_2$e) | $0.30 | $1.41 | $0.30 | |
| Net Benefit ($/tCO$_2$e) | $2.10 | $2.09 | $1.80 | |
| Reductions (million tCO$_2$e) | 8.7 | 5.7 | 6.2 | 20.6 |
| Climate Finance Allocated (USD million) | $20.9 | $20.0 | $13.0 | $53.9 |
| Premium Funds Raised (USD million) | $2.6 | $8.0 | $1.9 | $12.5 |
| Budget (USD million) | $25.0 | $20.0 | $13.0 | |

# Maximizing Impact of Climate Finance

- **PAF results**


- **Public funds leverage private sector investment**
  - UNFCCC reports CDM leverages $10 private sector investment for every $1 of public funds

# First and Second Redemptions

- **2016, 2017 Redemption Totals**
  - 4.7 million eligible carbon credits delivered
  - US$12.7 million paid to 15 investors
  - Projects: landfill gas-to-energy in Brazil, Chile, Malaysia, Mexico Thailand, and Uruguay; wastewater treatment & biogas utilization in Thailand; and nitrous oxide abatement in Egypt

- **CERs / VCUs / VERs transferred or cancelled on behalf of Participants**

# Core Elements of Climate Auction Model

**Climate auction model:** price guarantee for climate assets, in the form of tradable options contracts

**Auctions**
**determine price of guarantee**

+

**Results-based**
**climate assets third-party verified**

+

**Risk sharing**
**firms pay upfront for price guarantee**

=

**MAXIMUM CLIMATE IMPACT PER DOLLAR OF PUBLIC RESOURCES**

# Opportunities for Replication and Scale

- **Nitric Acid Climate Auctions Program**
  - Eligible countries to be determined by political commitments between NACAG and host governments that agree to continue abatement of N2O from nitric acid production beyond 2020

- **Energy efficient green buildings**
  - New investments
  - Climate assets beyond CO2e: certification standards including Excellence in Design for Greater Efficiencies, LEED, etc.

- **Assisting client countries to meet or raise ambition of Paris targets**
  - Climate auctions on the national or sub-national level
  - Funded by domestic finance or blend of international climate finance with domestic resources

# PILOT AUCTION FACILITY

## for Methane and Climate Change Mitigation

**World Bank Climate Auctions Program**

**Stephanie Rogers**

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# Sector Identification: CO2

| | Energy | Industry | Transport | Buildings | Industrial Gases | Forestry/ Land Use |
|---|---|---|---|---|---|---|
| Established MRV Processes | ● | ● | ○ | ● | ● | ● |
| High Number of Projects | ● | ● | ○ | ◗ | ● | ◗ |
| Strong Private Sector Engagement | ◗ | ● | ○ | ● | ● | ◗ |
| Strong Sustainable Development Impacts | ● | ◗ | ● | ● | ◗ | ● |

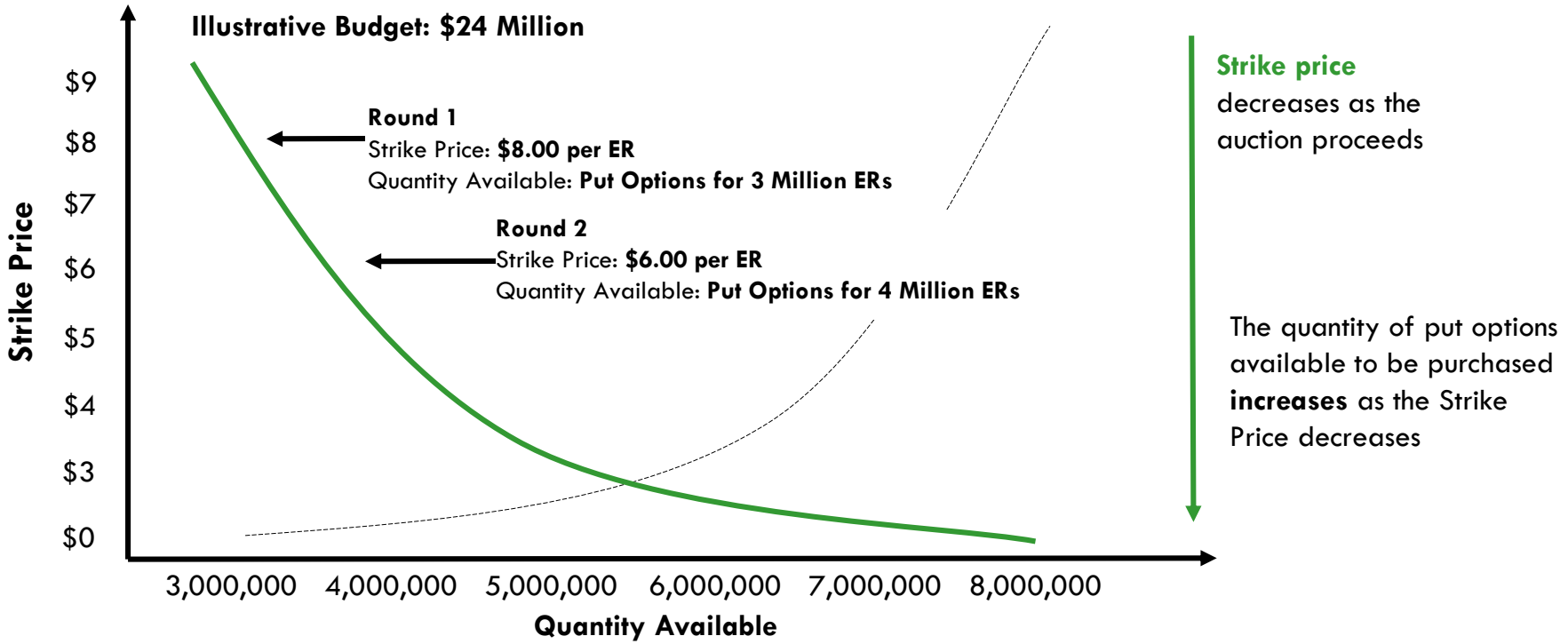
● yes ◗ potential ○ no

# Sector Identification: Non-CO2

| | Landfill | Coalmine Methane | Nitric Acid and Adipic Acid Production | HFCs from Refrigeration and Air Conditioning | Oil and Gas | Rice Cultivation | Livestock |
|---|---|---|---|---|---|---|---|
| Established MRV Processes |  |  |  |  |  |  |  |
| High Number of Projects |  |  |  |  |  |  |  |
| Strong Private Sector Engagement |  |  |  |  |  |  |  |
| Strong Sustainable Development Impacts |  |  |  |  |  |  |  |

# Auctions 1 and 3

- In auctions 1 and 3, bidders bid on the option's "Strike Price", which is the payment (i.e., reward) bidders receive in exchange for ERs on a future date
- The PAF used a reverse descending clock auction where the option's premium (i.e., upfront cost) is fixed and bidders bid down the strike price



# Auction 2

- In auction 2, bidders bid on the option's "Premium" (i.e., upfront cost), which is the amount bidders pay to purchase the put options
- The PAF used a forward ascending clock auction where the option's strike price (i.e., future reward) is fixed and bidders bid up the premium