INTRODUCTION TO REVERSE AUCTIONS

Overview and Considerations

Paolo Cozzi
USEA Reverse Power Auction Workshop
Morogoro, Tanzania, July 2016
A Think Tank that Does

- Acid Rain Legislation
- Pioneered JI mechanism with Czech Republic CHP project
- Early design and promotion of NAMA concept
- In-country work promoting transformational projects


- Technical, Policy, and Economic Analyses
- Publications and Outreach
- Multi-Stakeholder Partnerships and Dialogues
- Innovative Solutions and Recommendations
- Execution
CCAP’S MITIGATION ACTION IMPLEMENTATION NETWORK (MAIN) -- MOBILIZING ACTION

Goals:

Create networks of policymakers involved in NAMAs in Asia and Latin America

Build capacity to develop bankable NAMAs

Facilitate financing for early NAMAs

Help countries go from NAMA’s to INDCs to NDCs

Components:

1. Regional dialogues of policymakers, experts, potential funders
2. Harvesting of best practices, case studies, policy solutions
3. Support for NAMA design, enabling policies, accessing financing
4. Bring MAIN countries input into UNFCCC, GCF, and other institutions

Supported by:
Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

based on a decision of the Parliament of the Federal Republic of Germany
1. Brief Case Study

2. Overview and Status of Reverse Auctions

3. Design Elements and Questions to answer
1990

United Kingdom

Margaret Thatcher

Source: schematherapysociety.org

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https://commons.wikimedia.org/w/index.php?curid=9350486
THE UK’S ELECTRICITY ACT PAVED THE WAY FOR AUCTIONS

- Privatize
- Save Nuclear
- Reduce GHGs


SecState can order RE Purchases → Non-Fossil Fuel Obligation
Key Features of the NFFO

- Technology-specific auctions
- 5 Rounds over 8 years
- Lowest price won
- Fossil Fuel Levy paid gap between market and contract price

Britain’s Non-Fossil Fuel Obligation

**NFFO Process**


Source: Cozzi, 2012
THE NFFO HELPED DRIVE DOWN PRICES, PARTICULARLY FOR WIND

TABLE 2  Eligible technologies by NFFO Order

<table>
<thead>
<tr>
<th>Technology</th>
<th>NFFO1</th>
<th>NFFO2</th>
<th>NFFO3</th>
<th>NFFO4</th>
<th>NFFO5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wind</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Wind sub-bands</td>
<td>—</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Hydro</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Landfill gas</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Sewage gas</td>
<td>✓</td>
<td>✓</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>M&amp;IW(^b)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>M&amp;IW(^c)</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>M&amp;IW/CHP(^d)</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Biomass(^e)</td>
<td>✓</td>
<td>✓</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Biomass(^f)</td>
<td>—</td>
<td>—</td>
<td>✓</td>
<td>✓</td>
<td>—</td>
</tr>
<tr>
<td>Wet Farm Wastes(^g)</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>✓</td>
<td>—</td>
</tr>
</tbody>
</table>

\(^a\)Eligible.
\(^b\)Municipal and industrial waste with mass burn technology.
\(^c\)Municipal and industrial waste with fluidized bed technology.
\(^d\)Municipal and industrial waste with combined heat and power.
\(^e\)Steam generation.
\(^f\)Gasification.
\(^g\)Anaerobic digestion.

Source: C. Mitchell (2000)
No penalty → developers made “best case scenario bids”

Any delays or disruptions could halt projects

Developers bid to undermine competitors

Failure to get planning permission stopped projects

### Wind: NFFO 3 at end of 5 year commissioning window

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Contracts Awarded</td>
<td>55</td>
</tr>
<tr>
<td>Commissioned</td>
<td>18</td>
</tr>
<tr>
<td>Permission Refused</td>
<td>13</td>
</tr>
<tr>
<td>Permission not requested</td>
<td>10</td>
</tr>
</tbody>
</table>
REVERSE AUCTIONS

Overview and Status
REVERSE AUCTIONS ARE GROWING IN POPULARITY

Number of countries with RE policies by type

Source: REN21 Global Status Report (2014)

RE Tariff-based policies in 2013

Source: IRENA (2014)
THERE ARE A NUMBER OF GOOD REASONS FOR A REVERSE AUCTION

- Competition-based mechanism
- Drives prices down – economically efficient
- Gives investors certainty
- Not reliant on government capacity to identify or predict appropriate prices
- Quantity-based mechanism facilitates planning
A REVERSE AUCTION IS ALMOST EXACTLY WHAT IT SOUNDS LIKE

Standard Auction

Reverse Auction
1. Government gives utilities auction quota
2. Utility organizes auction
3. Utility selects winners based on criteria
4. Winning PDs receive PPAs ($/kWh for X years), start construction
5. Utility pays PDs for power based on PPA
## FEED-IN TARIFFS VS AUCTIONS

<table>
<thead>
<tr>
<th>Similarities</th>
<th>Tariff-based instruments</th>
<th>Provide Price Certainty &amp; Long-term contracts</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Differences</th>
<th>Feed in Tariff</th>
<th>Reverse Auction</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Feed in Tariff</strong></td>
<td>Any</td>
<td>Medium to Large (or aggregated small)</td>
</tr>
<tr>
<td>Administrative</td>
<td>Project Size</td>
<td>Competitive</td>
</tr>
<tr>
<td>Lower</td>
<td>Price Determination</td>
<td>Higher</td>
</tr>
<tr>
<td>Low</td>
<td>Barriers to Entry</td>
<td>Higher (maximum quantity known)</td>
</tr>
<tr>
<td>• Underdeployment</td>
<td>Quantity Predictability</td>
<td>• Underbidding</td>
</tr>
<tr>
<td>• Excessive subsidy</td>
<td>Key Risks</td>
<td>• Crowding out smaller actors</td>
</tr>
<tr>
<td>Yes</td>
<td>Continuity</td>
<td>Not necessarily</td>
</tr>
</tbody>
</table>

- Key Risks
  - Underbidding
  - Crowding out smaller actors
BASICS OF DESIGNING A REVERSE AUCTION
1. What are your overarching goals?
2. What are you looking to promote?
3. What type of auction will you have?
4. How will you select winners?
5. How will you ensure deployment?
6. How will you overcome auction weaknesses?
WHAT ARE YOUR GOALS?

Reasons for a Reverse Auction

- Diversity
- Savings
- Create New Industries
- Price Discovery
- Reduce Emissions
- Increase Access
- Other?

- Other

- Source: Clipartpanda
- Source: World artsme.com
- Source: Bellona.org
- Source: Cleanenergyministerial
- Source: Clipartbro.com
- Source: Cleanenergyministerial

Brazilian Energy Matrix in 2014

- Source: Clipartpanda
WHAT ARE YOU LOOKING TO PROMOTE?

Size?

On-Grid

Off-Grid/Micro-Grid

Connection?

Technologies?
WHAT TYPE OF AUCTION WILL YOU HAVE?

Sealed Bid
- Bidders submit at same time, don’t know others
- Bids ranked highest to lowest based on criteria
- Winners receive PPAs @ their bid or clearing price
- Simple, easy to administer

Descending Clock
- Auctioneer announces price
  - Bidders ID how much RE they can supply at price
- Price descends until offer matches demand
- More dynamic
- Allows for effective price discovery
• **Criteria**: Price is default, but can include others, i.e.:
  – Local Employment
  – Environmental Benefits
  – Industrial development
  – Proximity to load centers
• Setting a **Ceiling Price** can limit expenditure but also contracting goals
  – Do not reveal before auction
• **Allocation** of winners?
HOW WILL YOU ENSURE DEPLOYMENT?

• **Challenge**: Competition → pressure to underbid.
  – Underbidding → low project completion rate

• **Tools**: There are several approaches to ensure compliance:
  – Deposits
  – Penalties
  – Front-end bidding requirements (land use and/or environmental permits, feasibility studies)

• **Tension**: More significant requirements can increase success rates, but can act as barrier to entry
• **Challenge:**
  – Unlike FiT, only being available at certain times can make RAs less conducive to private sector development

• **Tools:** To address this, governments may want to ensure they are held frequently, or at least regularly

• **Tension:** Holding frequent auctions can ultimately lead to high administrative costs
Reverse auctions should be designed with the country’s specific goals and challenges in mind.

<table>
<thead>
<tr>
<th>Challenge/Goal</th>
<th>Potential Design Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase electrification rate with distributed energy</td>
<td>• Window for aggregated projects</td>
</tr>
<tr>
<td></td>
<td>• New connections as criterion</td>
</tr>
<tr>
<td>Attract in-country investment to enhance private sector capacity</td>
<td>• Regular schedule for auctions</td>
</tr>
<tr>
<td></td>
<td>• Long-term goal</td>
</tr>
<tr>
<td>Encourage competition in sector</td>
<td>• Limits on max firm share</td>
</tr>
<tr>
<td></td>
<td>• Minimize requirements to bid</td>
</tr>
<tr>
<td>Ensure grid can handle injections</td>
<td>• Site-specific/ geographic limit</td>
</tr>
<tr>
<td></td>
<td>• ID investment roles in contract</td>
</tr>
<tr>
<td>Develop domestic manufacturing industry</td>
<td>• Local Content Requirement</td>
</tr>
<tr>
<td></td>
<td>• Criteria focus</td>
</tr>
<tr>
<td>Utility creditworthiness</td>
<td>• Dedicated funding streams</td>
</tr>
<tr>
<td></td>
<td>• Credit guarantee instruments</td>
</tr>
<tr>
<td>Fight Corruption</td>
<td>• Clear criteria and process</td>
</tr>
<tr>
<td></td>
<td>• Descending clock approach</td>
</tr>
</tbody>
</table>
Reverse Auctions (RAs) are potentially an economically efficient way to deploy renewables.

RAs are growing in popularity around the world, partly as a backlash against FiTs.

As a quantity-based mechanism RAs support specific planning.

There is a tendency for RAs to lead to underbidding and underdeployment.

The underdeployment risk can be mitigated through additional bidding requirements, but these can discourage participation.
THANK YOU

For more information, please visit us at www.ccap.org.