Session 1.2: Showcasing Low-Carbon Transition Technologies

Business Models for Floating PV in Azerbaijan

June, 2021
Business Models for Floating PV in Azerbaijan

TA-9564-REG- Floating Solar Energy Development

initiate the building of the three selected countries first large-scale FPV plant

**Outcome**

**Objectives**

- Enhance knowledge and technical skills in designing, constructing and operating floating PV plants (pilot and commercial scale)
- Enhance knowledge and technical skills in policies and tariff structures
- Hands-on institutional capacity building including in-depth study tours in leading FPV countries

**Scope of work**

**Component 1**
Design, procure and supervise implementation of pilot projects and develop corresponding scaled-up projects in the three selected countries

**Component 2**
Analyze policies and tariff structures and recommend suitable for business models for the three selected countries

**Component 3**
Institutional Capacity Building for Stakeholders

MANILA, JUNE 2021
Implementation Strategy:

- Determination of the supporting mechanisms;
- Preparation on the realization of auctions on the renewable energy zones;
- Development of the tariff methodology;
- Determination of financial sources;
- Development of the regulatory and legal framework;
- Cooperation with the partners (potential investors);

Planned capacity addition with RE projects

<table>
<thead>
<tr>
<th>2020-2022</th>
<th>2023-2025</th>
<th>2026-2030</th>
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<td>440 MW</td>
<td>460 MW</td>
<td>600 MW</td>
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Reduction of greenhouse gas emissions – 35% by 2030

Renewable Energy share in total installed capacity, %

Source: Ministry of Energy of Azerbaijan
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Renewable energy projects

- **Auctions**
  - The auctions rules *(the project is underway)*
  - RFQ *(the draft project is ready)*
  - RFP *(the project is underway)*

  *The winner of the auction is the entity which submitted the lowest price offer*

- **Bilateral Agreement**

  *Bilateral agreement shall be carried out in the following cases:*
  - during the implementation of pilot projects;
  - if deemed necessary in terms of the interests and strategic importance of the state;
  - if it is not possible to determine the investor at the auctions or if the auction did not take place.

*Source: Ministry of Energy of Azerbaijan*
Protection of the investment (existing in the legislation)
- Tax rebates within seven years (investment promotion mechanisms)
  - 50% reduction of income tax for individual entrepreneurs;
  - 50% reduction of profit tax for legal persons;
  - no VAT and no customs duties on imports of machinery, technological equipment and installations;
  - no property tax;
  - no land tax.
- Guaranteed off-take (Take or pay)
- Guaranteed connection
- Priority in dispatching
- Possibility of indexation of payments to foreign currency
- Long-term land lease
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Some Floating PV projects... (1/3)

Huainan, China Photo courtesy of: Sungrow

Yamakura Dam Photo courtesy of: Ciel & Terre

Murcia, Photo courtesy of: Isigenere
Why floating PV?

- Cost of water surface is lower than land
- Land has alternative uses
- Reducing evaporation rates
- Reducing water maintenance
- Lower visual impact
- Higher energy yield. Site specific
- It can be used with and without water

Countries with current FPV installations

Typical FPV Project (50MW-100MW)

- **Investment:** USD 50 - USD 100
- **Water area cover:** 60-120 ha
- **Useful life:** 25 years
- **Energy yield:** 75 GWh/year - 150 GW/year
- It can provide a competitive energy on the range of USD 25/MWh to USD 50/MWh
TRADITIONAL PROCUREMENT (DESIGN-BUILD OR EPC CONTRACTS)

DESIGN, BUILD AND FINANCE (DBF) CONTRACTS

Works are financed by the public sector. Payments for the works are received by the contractor as work progresses (funded by the budget) and the asset is received by the Authority at construction completion.

Source: PPP Certification Guide, WB
**Business Models for Floating PV in Azerbaijan**

**FIGURE 1.4: Basic Scheme of a Design, Build, Operate and Maintain (DBOM) Structure**

PPP contracts (BOT or DBFOM contracts)

Works are financed by the public sector. Payments for the works are received by the contractor as work progresses (funded by the budget) and the asset. Thereafter the contractor (considered here as a private partner) provides maintenance (or operate and maintenance and is paid an O&M price for it). Works may be received by the Authority at construction completion or at the end of the contract depending on the jurisdiction and project.

- Service related flows
- Contract relationship
- Cash related flows

Note: O&M= operations and maintenance.
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**FIGURE 1.4: Basic Scheme of a Design, Build, Operate and Maintain (DBOM) Structure**

- **AUTHORITY**
  - Payments (for and during construction and O&M payments during O&M period)
  - Delivers the asset at construction completion, and provide maintenance afterwards

- **CONTRACTOR**

**PPP contracts (BOT or DBFOM contracts)**

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**FIGURE 1.6: Basic Scheme of a DBFOM Structure (government-pays)**

- **HAND-BACK**
  - Payments during O&M based on volume or availability
  - Provides bundled DBFOM service

- **PRIVATE PARTNER**
  - Loan agreement

- **LENDERS**
  - Construction contract
  - O&M contract

- **CONSTRUCTION/EPC CONTRACTOR**
  - User charges

- **O&M CONTRACTORS**

- **EQUITY INVESTORS**

- **USERS**

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**Note:** DBFOM= Design, Build, Finance, Operate and Maintain; EPC= Engineering, Procurement and Construction; O&M= operation and maintenance; PPP= public-private partnership.

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**Description:**
- **Service related flows**
- **Contract relationship**
- **Cash related flows**

*Works are financed by the public sector. Payments for the works are received by the contractor as work progresses (funded by the budget) and the asset. Thereafter the contractor (considered here as a private partner) provides maintenance (or operate and maintenance and is paid an O&M price for it). Works may be received by the Authority at construction completion or at the end of the contract depending on the jurisdiction and project.*
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IPP- Public off-taker

Azerishiq OJSC, Baku electrical grid operator

Payments during O&M based on electricity produced

PPA

Provides energy

Loan agreement

Articles of association and Shareholders Agreement

Authority (Offtaker)

Hand-back

LENDERS

Construction contract

Equity Investors

O&M Contract

CONSTRUCTION/ EPC CONTRACTOR

Lenders

Loan Agreement

Shareholder Agreement

Construction Contract

O&M Contract

EPC Supplier

O&M

Connection Agreement

Site Right Agreements

Investment Support Agreement

PPA

PPA

Payments during O&M based on electricity produced
Risks

- Currency risk
- Off-taker creditworthiness
- Curtailment risk
- Poor technical specifications and permits
- Funding risk
- Legal change risk
- Political risk

Process

- Pre-bidding market sounding
- Procurement framework:
  - Ceiling tariff,
  - Competitive bidding capacity limits,
  - Tariff indexation,
  - Qualification criteria and
  - Tender documents.
- Clear bidding mechanisms
- Contractual arrangements and supporting mechanisms
Thank you for your attention

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