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# Building PPA contracts

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## The regulator and the PPA contracts

- The PPA is a contract between an electricity producer and a purchasing entity (usually a local utility) for the purchase of electricity generated by a power plant.
- The purchasing entity is often a market player under obligation.
- It defines the price at which generated power is sold as well as various other obligations between parties.
- Negotiating an appropriate PPA is among the most complicated aspects of developing a clean power project
- The regulator may facilitate the penetration of renewable energy plants by producing a PPA standard contract.
- Writing the template is also an opportunity to double-check potential flaws in the existing regulatory and legislative framework.



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## PPA may be signed at different time of plant commissioning



Registration of the company



Land titles, water rights, environmental clearance



Techno-economical connection verification



Financing



Construction of the plant



Power Purchase Agreement Signature





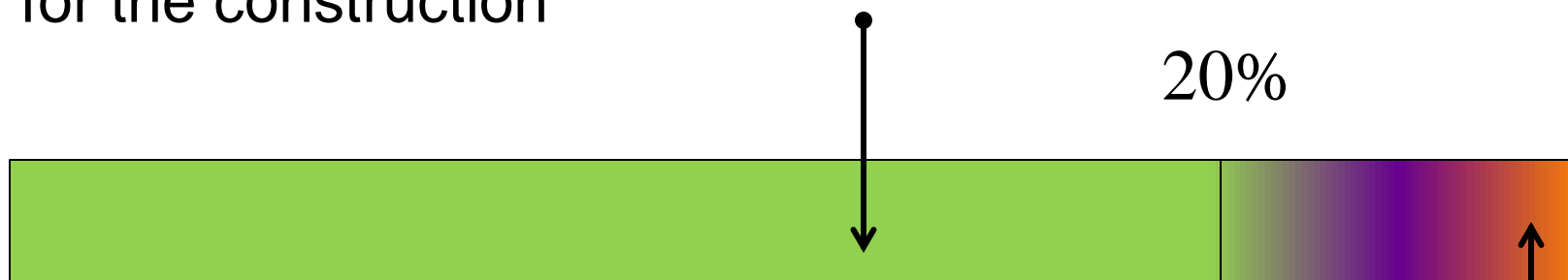
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## When does the developer get the right to build the plant?

- If the right to build the plant is got before its construction, it is necessary to introduce a deadline for the construction



- If the PPA is signed when the plant is functioning it is necessary to establish a monitoring mechanism not to exceed renewable target



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## What kind of PPA

- Bilateral between the purchaser and the seller (Cape Verde, Gambia larger size)
- Standard, published by the regulator and used by any IPPs willing to sell RES in the market
- A more flexible approach where the standard contract is the *last resource* of an open process between the parties. If they have no better agreement they use the standard one

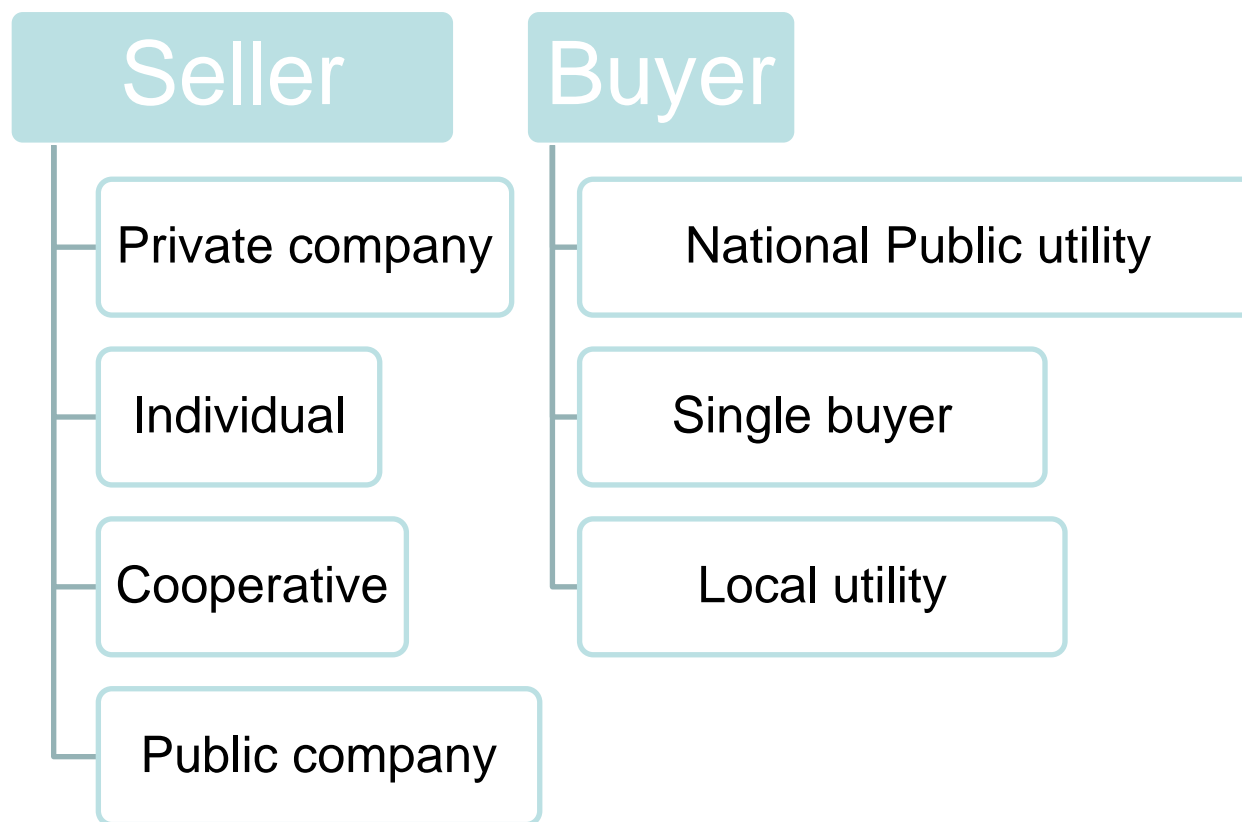


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## The parties





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## The buyer

- The buyer, it is the legal entity the obligation to purchase RES electricity is set upon. *The buyer needs to be financially reliable.* It may be a public utility or an ad hoc institution.
- The buyer may be the same legal entity asked to connect the new renewable plant. Attention! This may discourage new comers



The flowchart illustrates the electricity market structure and the flow of goods and money. The central vertical flow represents the flow of electricity (goods):

- Public utility Monopoly** (top)
- Generation**
- Trans-Dist**
- Sales**
- Final customers**
- Losses** (bottom)

On the left, **RSPP 1** and **RSPP 2** are connected to the **Public utility Monopoly** and **Generation** respectively.

On the right, the **Government** and **Regulator** are connected to the **Renewable Fund**, which in turn is connected to the **Public utility Monopoly**.

**Flow of Money (Yellow Arrows):**

- From **Public utility Monopoly** to **RSPP 1** (labeled with a yellow box containing '\$').
- From **Regulator** to **Renewable Fund** (labeled with a yellow box containing '\$').
- From **Renewable Fund** to **Public utility Monopoly** (dashed blue arrow).

**Flow of Electricity (Red Arrows):**

- From **Public utility Monopoly** to **Generation**.
- From **Generation** to **Trans-Dist**.
- From **Trans-Dist** to **Sales**.
- From **Sales** to **Final customers**.

**Other Flows (Blue Arrows):**

- From **Public utility Monopoly** to **Renewable Fund** (solid blue arrow).
- From **Renewable Fund** to **Government** (dashed blue arrow).
- From **Government** to **Public utility Monopoly** (dashed blue arrow).
- From **Final customers** to **Regulator** (labeled with a yellow box containing '\$').





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- With PPA signature the plant developer should be able to have a clear vision of all components of LCOE formula
- Retroactive changes are damaging to investor confidence

## **2. Effective and efficient support must balance stability with adaptability.**

Stability is vital to create investor confidence in support mechanisms, otherwise, investments may fail to take place or be more expensive due to higher risks. Nevertheless, policies must be able to adapt to changing circumstances and respond to as many signals from the market as possible. Experience suggests that performing various degressions and regular reviews can work effectively. Retroactive policy changes, by contrast, are highly damaging to investor confidence.



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## Preambles

- ✓ Definition and identification of the parties
- ✓ Recall of the legal basis the PPA is built upon (whereas)
- ✓ List of the IPP licensing requirements (land, water right, environmental impact assessment)
- ✓ Definitions of terms and rules of interpretation
- ✓ Effective date of commencement and duration of the PPA

$$C_{lev} = \frac{\sum_{j=0}^n \frac{Expenses_j}{(1+i)^j}}{\sum_{j=0}^n \frac{Quantities_j}{(1+i)^j}}$$

where

$C_{lev}$  = levelized cost  
 $n$  = lifetime of the project  
 $i$  = discount rate



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## Power plant identification and metering specification

- ✓ Description and identification of the power plant, technology, capacity, expected monthly output
- ✓ Definition of the point of delivery, GIS coordinates
- ✓ Procedures for metering produced electricity eligible to feed-in tariff
  - ✓ Technical requirement of metering
  - ✓ Responsibility for metering
  - ✓ Inspection to metering devices



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## Payment of electricity (Remuneration $\geq$ LCOE)

- Price per kWh [legal basis]
- Updating of tariff [legal basis]
- Timing and format of billing
- Timing of payments
- Management of delayed payments
- Adjustment and balance of payments
- Rules for curtailments

$$C_{lev} = \frac{\sum_{j=0}^n \frac{Expenses_j}{(1+i)^j}}{\sum_{j=0}^n \frac{Quantities_j}{(1+i)^j}}$$

where

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<http://ppp.worldbank.org/public-private-partnership/sector/energy/energy-power-agreements/power-purchase-agreements>

[http://www.retscreen.net/ang/power\\_purchase\\_agreements.php](http://www.retscreen.net/ang/power_purchase_agreements.php)

## **POWER PURCHASE AGREEMENTS**

A power purchase agreement (PPA) is a contract between an electricity producer and a purchasing entity (usually a local utility) for the sale and purchase of electricity generated by a power plant. It defines the price at which generated power is sold as well as various other obligations with respect to purchase of the generated power. A properly negotiated PPA is a critical part of a clean energy project (and often a precondition to external financing), as it allows a developer to accurately estimate the project's revenue stream over a number of years. Negotiating an appropriate PPA is among the most complicated aspects of developing a clean power project.

[PPA Template - 39pg - General - MS Word \(330 KB\)](#)

[Master PPA - 43pg - USA - MS Word \(1.37 MB\)](#)

[Master PPA Optional Provisions - USA](#)

[Annotated Solar PPA - USA](#)

[Solar PPA Template - 36 pg - USA - MS Word \(293 KB\)](#)

[Wind PPA - 38pg - USA - PDF \(92 KB\)](#)

[PPA for Renewable Energy - 46pg - Canada - PDF \(296 KB\)](#)

[Short Renewables PPA with Additional Documents - USA](#)

[Comprehensive Offshore Wind PPA - 117pg - USA - PDF \(976 KB\)](#)

[Standard Sample PPA - 19pg - Sri Lanka - PDF \(92 KB\)](#)

[Comprehensive PPA - 96pg - Sri Lanka - PDF \(501 KB\)](#)

[French Language Renewable Energy PPA Document Suite - France](#)