

Power Projects in Context



Project made possible through funding by:



In Partnership with:

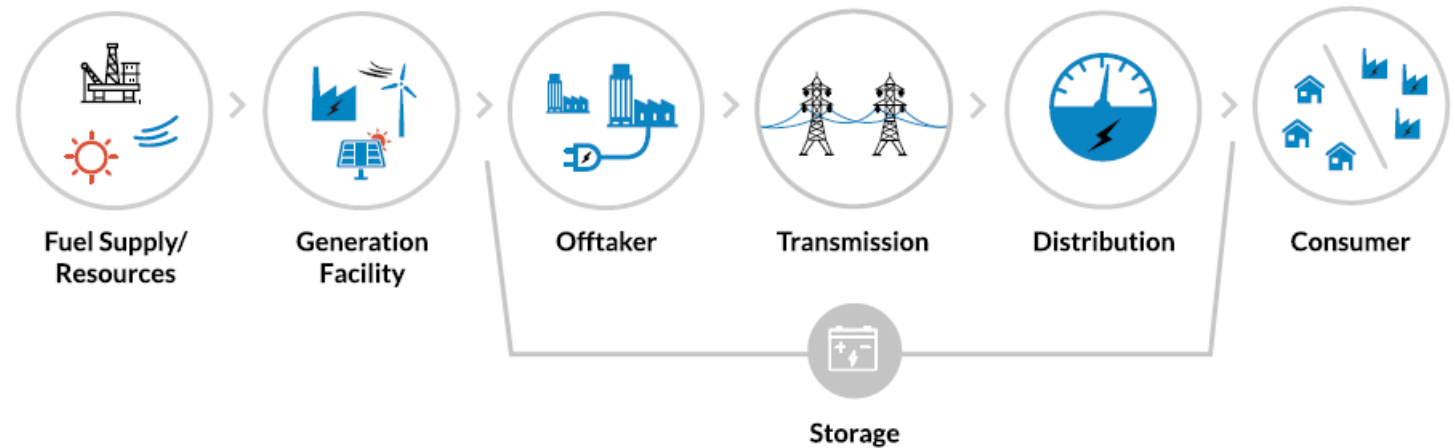


Institutional Partners:



POWER GENERATION MARKETS

Three Segments: *generation, transmission, and distribution*

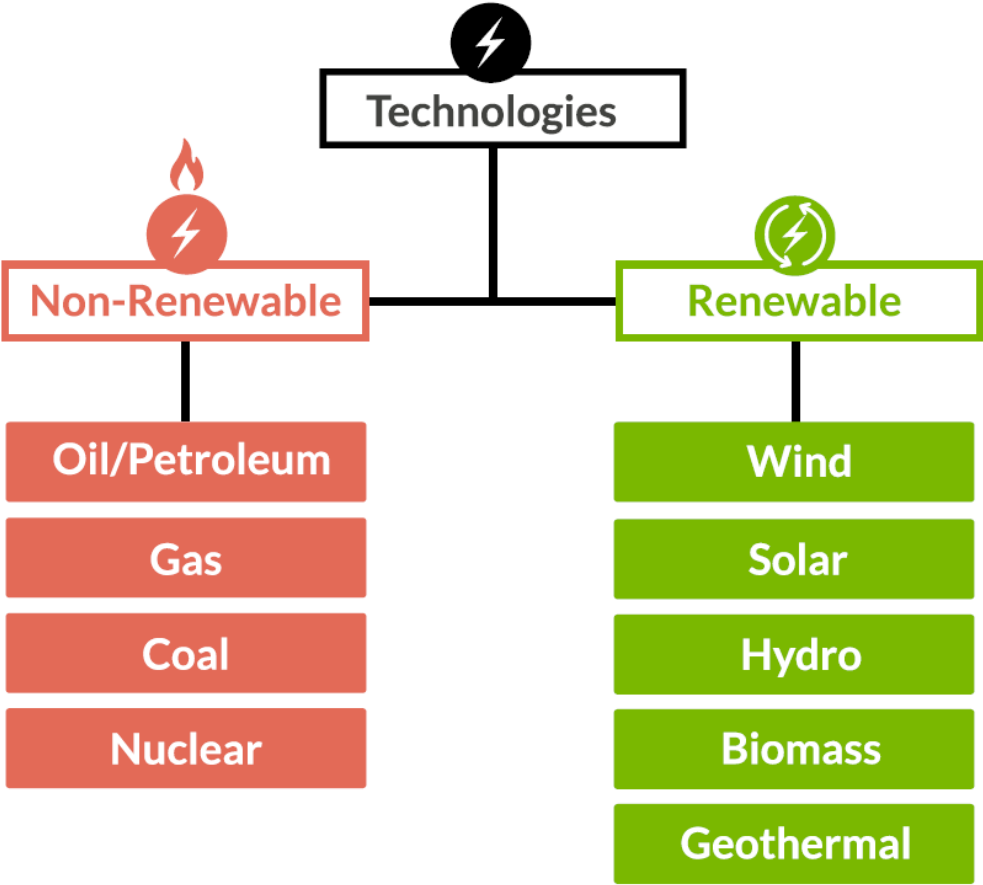


- **Generation:** *the process of generating electrical energy from various sources of primary energy*
- **Transmission:** *the movement of this energy at high voltage over long distances from producers to distribution/supply companies*
- **Distribution:** *the transport of energy over distribution networks and its delivery to consumers*

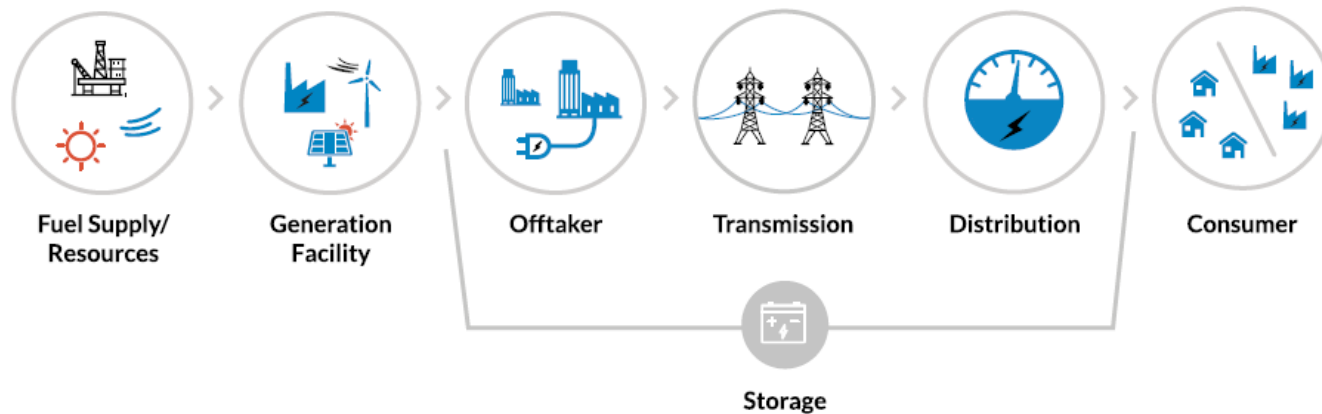


POWER GENERATION TECHNOLOGIES

**Each technology will have different implications for the structure of the PPA and the prices paid.*



WHOLESALE AND RETAIL MARKETS



Wholesale market: power is purchased in *bulk* by buyers (offtakers) from the producers at or near the point of generation

Retail market: power is transmitted through transmission lines and distribution systems to domestic and commercial (*retail*) consumers*

*There may be a number of changes in the "ownership" of the power before it reaches retail consumers

How is power bought and sold?

- A kilowatt hour (**kWh**) is equal to 1,000 watts of electricity used continuously for one hour.
- A megawatt hour (**MWh**) is equal to 1,000 kilowatts of electricity used continuously for one hour.

Capacity is purchased and sold in MW and, in many cases, is paid for regardless of whether the capacity is actually used.

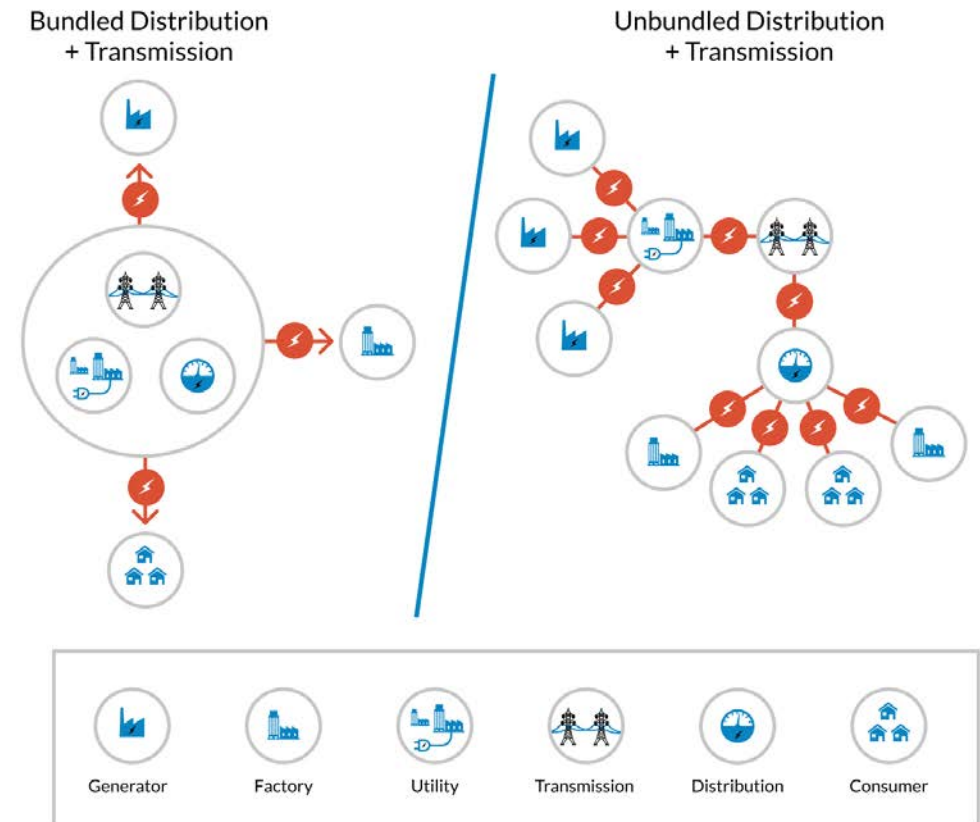
Energy is purchased and sold in MWh or kWh and is paid for only when consumed.



BUNDLED VS. UNBUNDLED SYSTEMS

How does the power get from the power plant to the consumer?

- **Bundled** systems: the roles of purchasing, transmission, and distribution are *bundled* into one entity – the buyer
- **Unbundled** systems: one or more of these roles (purchasing, transmission, distribution) is not the responsibility of the buyer but handled by another entity



ROLES OF THE ACTORS

Primary actors

- Offtaker (buyer)
- Power producer (seller)

Secondary actors

- Host government
- Regulator
- Consumers
- Transmission company
- Distribution company
- Lenders
- Construction company (EPC contractor)
- Plant operator
- Fuel supplier
- System operator

Offtaker (buyer): the power purchaser; often a state-owned utility

Power producer (seller): the power producer/generator; the owner of the project



ENABLING PRIVATE INVESTMENT

Private Participation in Power Delivery

- There has been a transition from power projects being exclusively funded through public finance to permitting private sector participation
- Project companies are profit driven and need to receive a return on their investment that is adjusted to the risks associated with emerging markets
- The revenue flow (i.e. payments under the PPA) must be stable and predictable for private developers to secure both the equity to develop the project and the debt to construct the project



ENABLING PRIVATE INVESTMENT

Special Considerations for Government

- Stable and predictable legal and policy framework
- Demand analysis and transmission system planning
- Cost-reflective tariffs
- Consumer metering
- Independent regulator
- Stable macroeconomic outlook



PROCUREMENT OF ELECTRICITY

- The price component of a tariff is usually established either by conducting a **competitive tender** or through **direct negotiation**
- A properly conducted international **competitive tender** is a **effective tool** for using competition to achieve a reduction in the cost of energy, and for increasing transparency in the power market.



ENVIRONMENTAL AND SOCIAL CONSIDERATIONS

Local law generally includes several environmental and social requirements that must be complied with (**lender standards**)

- **Environmental considerations:** emission levels, destruction of forests, contamination of water sources, degradation of water quality
 - Failure to adequately address environmental risks may result in sanctions by local authorities and negatively affect a project's ability to access financing
- **Social considerations:** worker rights, community outreach/impact, resettlement, gender equity





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