Renewable energy auctions
Design to address risks and achieve objectives beyond price

16 November 2023

Auctions strengths and weaknesses

Strengths

- Provide greater certainty regarding prices and quantities
- Permit real price discovery
- Enable commitments and transparency
- Flexibility in the design according to conditions and objectives

Weaknesses

- Associated with relatively high transaction costs for both developer and auctioneer
- Risk of underbuilding and delays
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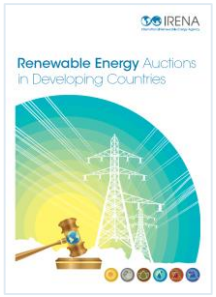
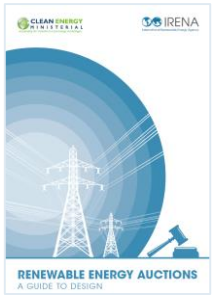
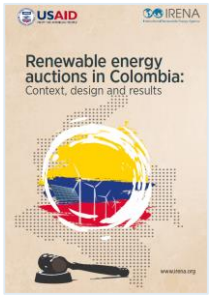
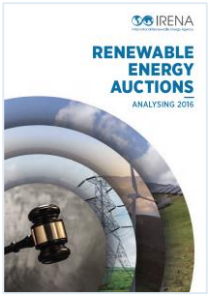
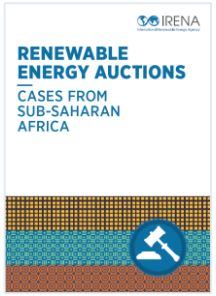
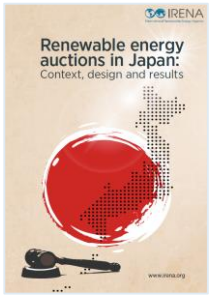


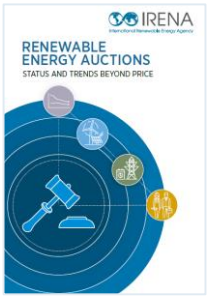


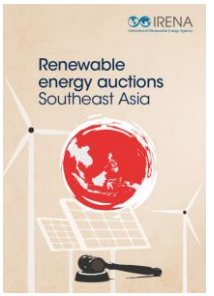












Factors that impact the price resulting from auctions

IRENA
International Renewable Energy Agency

Country-specific conditions

- Potential of renewable energy resources
- Financing costs
- Installation and building costs (land, labour, energy, etc.)
- Ease of access to equipment
- Foreign exchange rates
- General fiscal legislation

Investor confidence and learning curve

- Credibility of the off-taker and additional guarantees
- Presence of a stable and enabling environment that is conducive to market growth
- Past experience with auctions for both auctioneer and developers
- Clarity and transparency of auction documentation and project bankability

Policies supporting renewables

- Renewable energy targets and national plans that provide a trajectory for the sector
- Fiscal and financial incentives for RE
- Grid access rules
- Risk mitigation instruments
- Policies to promote broader development objectives (incl. socio-economic benefits and industrial dev)

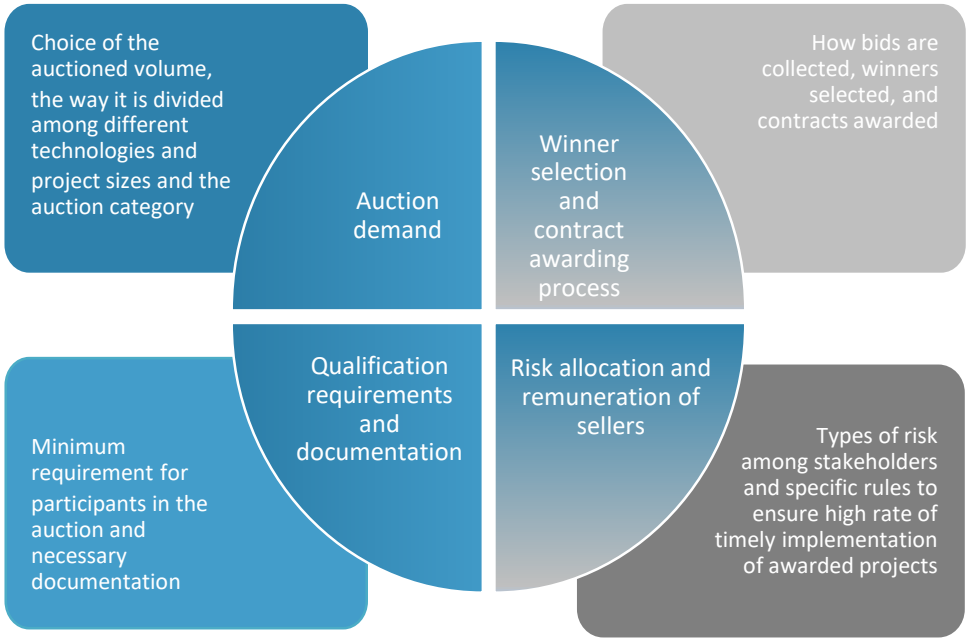
Auction design

Trade-off between lowest price and other objectives:

- Auction demand (auctioned volume, off-taker, regularity of auctions)
- Qualification requirements
- Winner selection method and criteria
- Risk allocation (compliance rules distribution of financial and production risks)

Price resulting from an auction

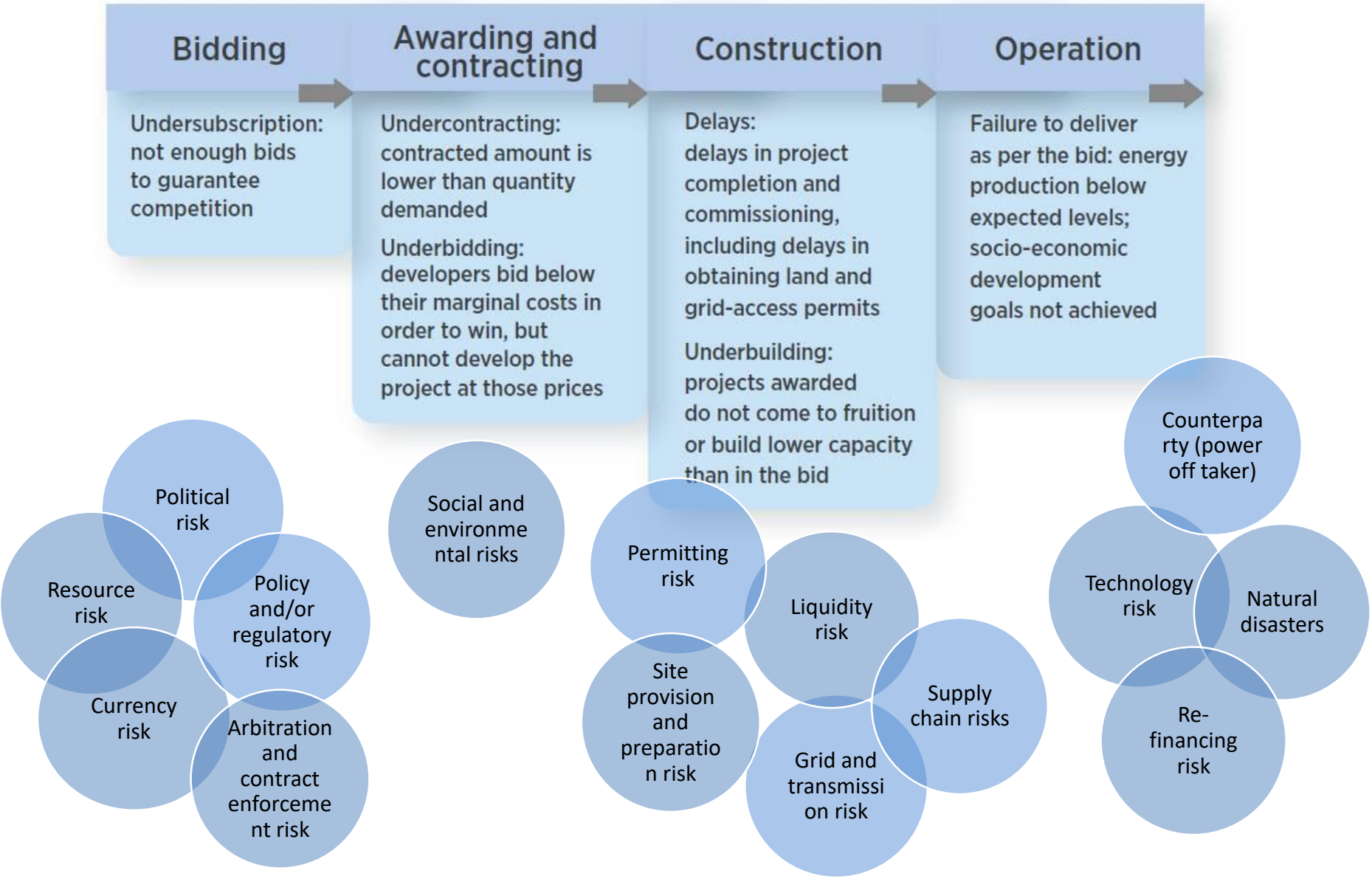
Auction design elements to allocate/address risks and achieve objectives beyond price



Source: IRENA and CEM, Renewable Energy Auctions: A Guide to Design, 2015

- Achieving the lowest price
- Ensuring timely project completion
- Supporting the integration of VRE
- Supporting a just and inclusive transition

Auction design to address risks at every stage of the auction process

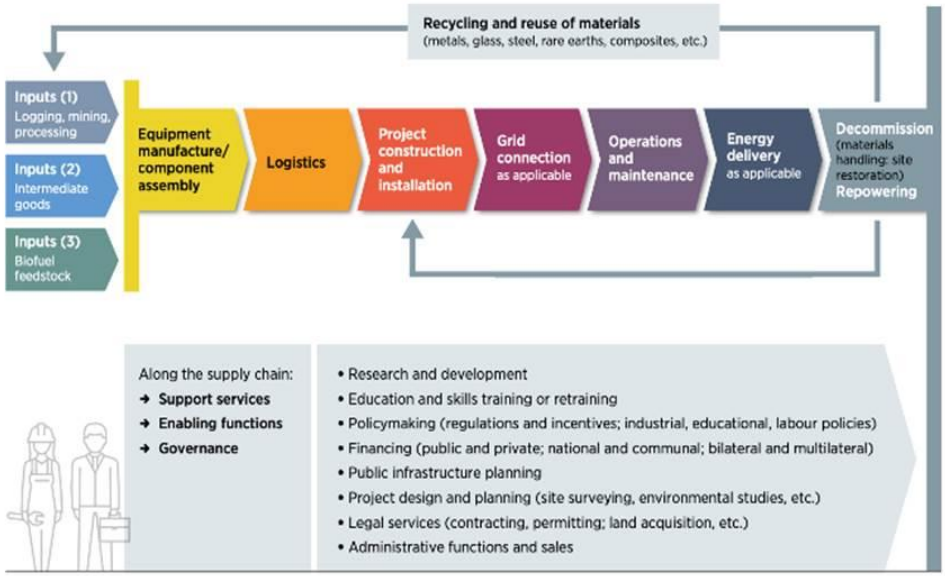


Example - Auction design to address political and regulatory risks

Risk	Stage in the auction	Auction design				Enabling env
		Auction demand	Qualification requirements and documentation	Winner selection	Risk allocation and remuneration	
Political risks	Bidding, construction and operation	Government partial ownership of project				Sovereign guarantees or alternatives RE targets
Policy/regulatory risks	Bidding, construction and operation	Government/ utility partial ownership of project Long-term schedule of auctions Funding the auction (tariffs passed over to consumers)	Generation license			Sovereign guarantees or alternatives Implementation/ government support agreements End of contract provisions

Auction design to address supply chain risks

Extended renewable energy supply chain



Design elements	To mitigate the impact of SC shocks and risks	To encourage the localisation of SCs
Direct effect	Extension of realisation periods Lower bid bonds Lower project completion bonds. Lower penalties Reopening of bids Contract renegotiation	Local content rules (LCRs) Environmental requirements (carbon footprint and circular economy requirements). Multicriteria auctions
Indirect effect	Increase ceiling prices Indexation Volume adjustments (reduce ratio bids submitted/auction volume from 1.5 to 1.2).	Reasonable prequalification requirements Penalties Lead times Announce a schedule with frequent auctions Technology-specific auctions (vs. technology-neutral ones).

Auction design to ensure just and inclusive transitions

Inclusion of small and new players

- Predetermined volume set for local, small and new players
- Technology-specific auctions and limited project size
- Preferential treatment (e.g. discounted bid bond) and less strict qualification req.
- Less strict compliance rules

Development of local industries and job creation

- Local content requirements and commitments for local job creation
- Winner selection criteria
- Regularity of auctions that support local industries

Subnational development and community benefits

- Zone-, site-, or project-specific auctions, can pre-select the sites and regions that best suit policy objectives
- Proof of land-use rights, grounded in solid documentation that is binding on auction participants

South Africa's socio-economic requirements

Element (weighting)	Description	Threshold	Target	Achievement as of March 2019
Job creation (25%)	RSA-based employees who are citizens	50%	80%	89% in construction and 95% in operation
	RSA-based employees who are black people	30%	50%	79% in construction and 83% in operation
	Skilled employees who are black people	18%	30%	67% in construction and 79% in operation
	RSA-based employees who are citizens and from local communities	12%	20%	67% in construction and 83% in operation
Local content (25%)	Value of local content spending	40-45% [a]	65%	52%
Ownership (15%)	Shareholding by black people in the seller	12%	30%	33%
	Shareholding by local communities in the seller	2.5%	5%	9%
Preferential procurement (10%)	BBBEE procurement [b]	-	60%	86% for construction and operations combined [c]
	QSE and SME Procurement [b]	-	10%	31% of total procurement as of March 2019 [d]
	Women-owned vendor procurement [b]	-	5%	3% of construction and 6% of operations
Socio-economic development (15%)	Socio-economic development contributions [e]	1%	1.5%	2.2%

Auction design to support increasing shares of VRE

Implemention strategy	Auction design
Project-based strategy	Project-specific auctions

Project-specific auctions aim for a highly predictable outcome. Tight control of the results through pre-determined parameters e.g. project size, technology, location and technological characteristics.

- Benefit developers (minimise costs and risks related to assessing resources, securing permits, and gaining access to the needed infrastructure) – Scaling Solar Programme
- Benefit operators (synchronise the development of new generation assets with grid infrastructure, reducing curtailment risks and other avoidable costs) (hybrid CSP and PV in Morocco and UAE or solar parks in India)

Quantity-based strategy	Constraints-based limits

Constraints-based auctions present hard limits to what, where and how to build the power plants, whilst allowing some degree of power plant design freedom.

Auction demand

- Zone-specific capacity limits, based on transmission constraints (e.g. Germany, Mexico and Peru). Can be set for each technology (e.g. Kazakhstan where solar and wind are distributed among regions)
- The auction demand specifications may also call for generation bound to a particular profile of production (Thailand) or combine production with storage (solar and batteries in Jordan)

Qualification requirements and documentation

- Require developers to obtain a statement from the grid operator to the effect that sufficient infrastructure exists to accommodate the proposed project (South Africa)

Auction design to support increasing shares of VRE

Implemention strategy	Auction design
Adjustment-based strategy	Predetermined corrections

With *ex-ante* conditions, adjustment-based strategies relies on the capacity of the power system operator to forecast future system needs soft ones - predetermined penalties or incentives to market agents who would provide services considered less or more valuable to the system

Winner selection

- Assign weight to proximity to the grid or bonuses or penalties according to technical characteristics (Mexico)
- Incorporate the expected value of electricity generated into a cost-benefit index that allows for a comparison of generators with different seasonal and hourly production profiles (Brazil)

Risk allocation and sellers' remuneration

- Before the auction, the auctioneer discloses some adjustment factors, which do not affect the selection of winners but rather the remuneration of the project once it begins operations. Payments are then subject to the adjustment, which may be positive or negative.

Price-based strategy	Exposure to market risks

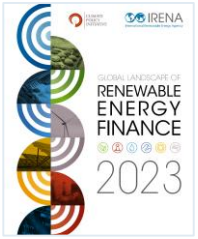
Unlike adjustment-based strategies, in which adjustments are set *ex ante* by the system operator based on an estimate of future system needs, price-based strategies assign the responsibility to developers of matching generation to system needs. They rely on the existence of a mature market capable of providing time- and location-based price signals.

Risk allocation and sellers' remuneration

- A straightforward method to adopt the price-based strategy is the use of fixed feed-in premiums, whereby operators receive a premium determined by the auction on top of their market revenue.

The key considerations in designing auctions

- The complex and dynamic environment of renewable energy auctions motivates constant innovation in the mechanisms' design.
- Understanding the reasons behind the low prices is important to make informed policy choices. Setting clear policy objectives is key.
- The extent to which the results are affected depends on choices regarding the design elements and how well adapted they are to the country's specific context (economic conditions, maturity of the power market and level of deployment).
- The value of renewable energy goes well beyond the energy services it provides. Therefore, trade-offs between cost competitiveness and other development objectives (such as jobs, industry development) should be carefully examined.



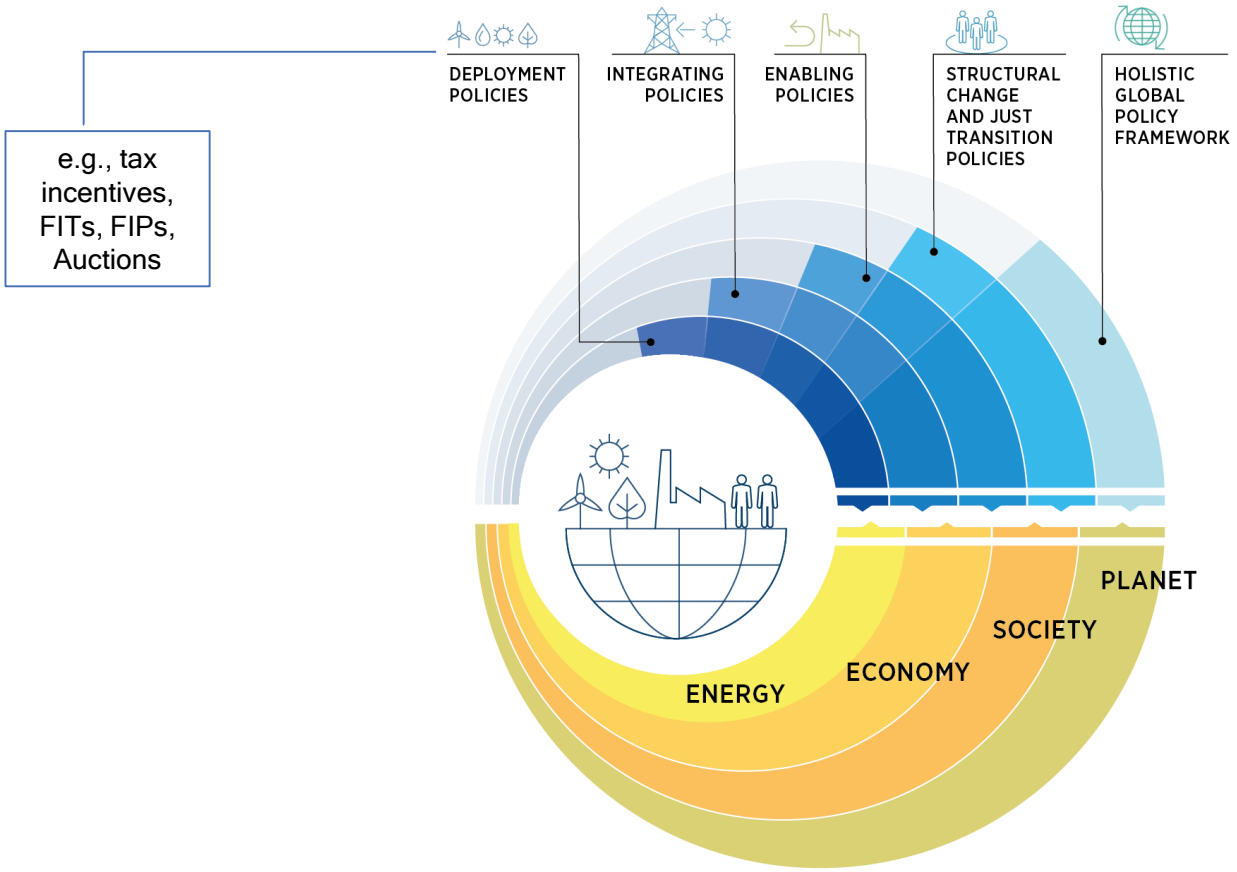
A more comprehensive way of defining risk (including risk sharing) is needed.

A narrow investor-centric focus on the risk of investment in energy assets not paying off needs to be broadened to include environmental, economic and social risks.

These include the risk of leaving a large part of the population out of the energy transition and locked in underdevelopment, and the risk of the Sustainable Development Goals remaining far from being met.

This is how investment risks must be viewed from the perspective of governments and the international community

IRENA's policy framework for the energy transition



Thank you!