

SOLAR AUCTIONS

STRATEGY + PREPARATION + CONTRACTS = SUCCESS

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Kudos to ESMAP!

“I suppose it is tempting, if the only tool you have is a hammer, to treat everything as if it were a nail.”

Abraham Maslow

“Is there someone so wise as to learn from the experience of others?”

Voltaire

Many technologies, many tools, many business models shared with participants floating solar, CSP, batteries...

Many success stories...first hand with full contexts

The essence of this presentation

"The first step to getting what you want is to have the courage to get rid of what you don't"

Zig Ziglar

"If I had an hour to solve a problem I'd spend 55 minutes thinking about the problem and 5 minutes thinking about solutions."

Albert Einstein

"I came to the conclusion long ago that limits to innovation have less to do with technology or creativity than organizational agility."

Ray Stata

*How do we **conceive auctions** such as to **balance competing interests** to create **win-win solutions** to **mobilize private investment at least cost**, leveraging **technology** that is **most apt to the context**.*

From feed-in-tariff mechanism (FIT) & negotiated transactions to auctions for contracting solar power at scale

FIT - government fixes tariff and signs (standard) PPA with eligible developers who register - Works well in early stage of market development. Alternatives include “**negotiated**” deals.

Auction is a procurement method to help governments **benefit from rapidly decreasing costs & innovations in technology** by making developers compete for right to develop project/ sell power

Competition forces developers to source the **most cost efficient technology** and **lowest cost financing** so that they can offer lowest tariff to win

Auctions could range from a **simple single stage competitive tender** to a **complicated iterative online auction**

Clearly articulate strategic choices before designing auction frameworks

Strategic objectives

Minimum tariff

Tariff as the only selection criteria

Utilize existing grid infra

Prioritize projects that connect to sub-stations with spare capacity

Scheduling flexibility

Require/ incentivize storage

Develop domestic supply chains

Auction rules require domestic content

Power system constraints and intermittency

Systemic solutions

Flexible scheduling of gas power plants or storage hydropower plants

Project specific solutions

Project level battery storage built into technical specifications

Mobilizing lower cost and longer tenor financing

De-risking projects prior to auction

- pre-arrange site & transmission
- simplify development process

Bankable PPAs

Internationally acceptable principles of risk allocation

Strategic choices influence auction framework: e.g. location constraint

Location indications

- Site is not specified.
- Weightages (location indications) are fixed apriori to prioritise projects that connect to different sub-stations, e.g. Mexico April 2016 A1 auction provided pricing adjustments (for bid comparison only) to encourage location in Yucatan and Baja California Sur States.

Sub-station specific auction

- Site is not specified. Grid substations are pre-specified along with capacity that could connect to these.
- Auction criteria is minimum tariff offered at specified sub-stations

Solar Park based auction

- Site is pre-specified. Land, evacuation and grid connections are preplanned by public agency.
- Reduces development risk, increases international participation, lowers cost of financing

Auction frameworks of different countries reflect their strategic choices and constraints

India (JNNSM program)

- Auctions for projects to be located in **solar parks** reduces risks
- **Online reverse auctions** enhance competition – but also raise winner curse issues
- **Local currency PPA with no indexing** as domestic financing markets are deep

South Africa (REIPP program)

- Including attributes such as job creation, domestic content, black ownership in selection criteria does not lead to minimum possible tariff

Argentina (RenovAR program)

- PPA fixed in USD, paid in local currency to address currency risks
- Trust Fund for Development of Renewable Energy (FODER) guarantees payments
- WB **guarantee** of USD 500 million for FODER to mitigate credit risks

Zambia (Scaling Solar)

- Standard process and contracts prepared by WBG enable **availability of IFC stapled financing** for winning bidder; **and WB/ MIGA guarantees**

There are some common lessons from auction experiences across countries

Prepare projects before auction to reduce risk

Manage lead time for grid upgradation: planning, financing, contracting, construction

Prepare site thoroughly

Make adequate resources available for preparation

High quality transaction advisors

Technical studies & upfront E&S assessments

Transparent process boosts competition

Multiple rounds of consultations with investors and lenders

In-depth sharing of data and documents with bidders

Bankable legal documentation help access low cost financing

Bankable contracts

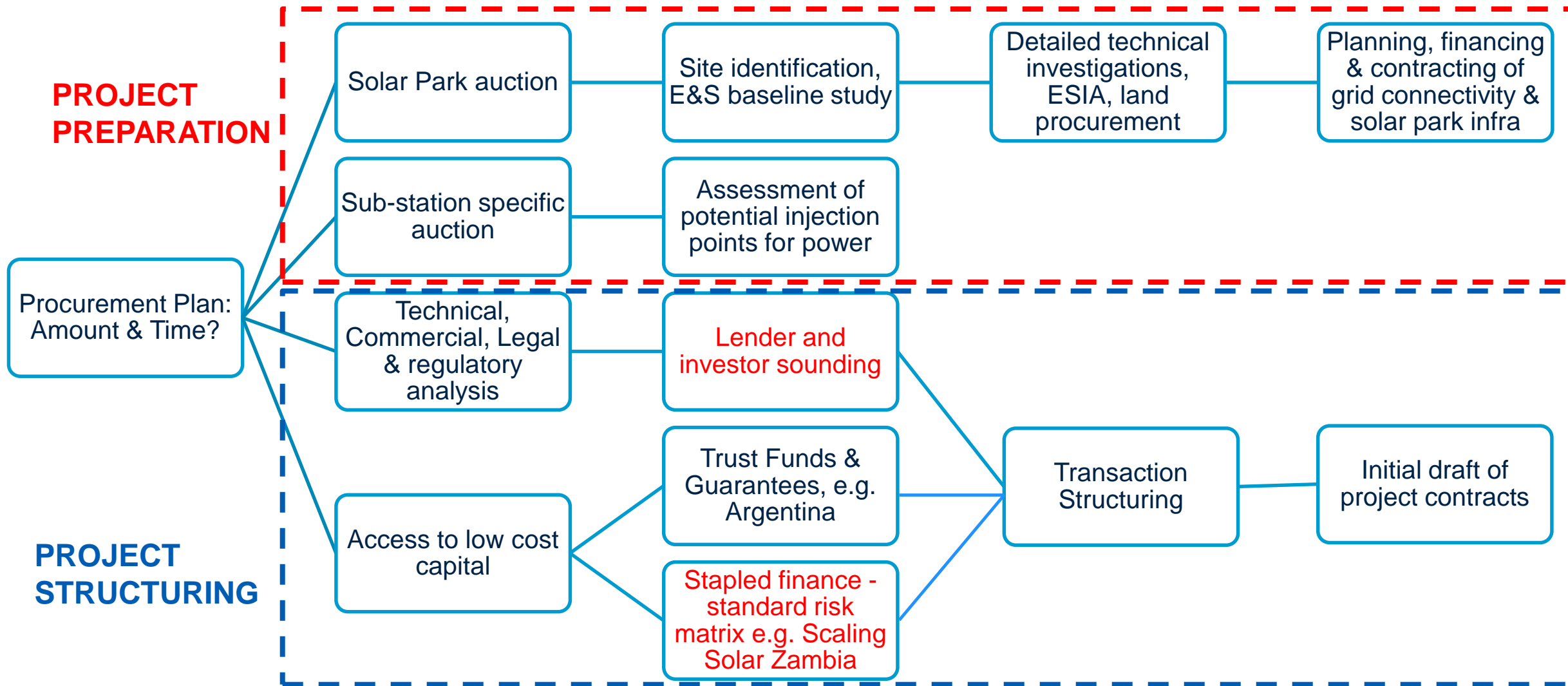
Risk mitigation and credit enhancements: guarantees, escrow

Signal lender's readiness to finance

Sign off by potential lenders prior to bid

IFI support/ stapled finance with standard risk matrix.

Project preparation & structuring prior to auction enables financing and/or lowers the cost of financing



Critical features of Power Purchase Agreements to enable project finance (1/3)

Assured offtake – Take or Pay

- Procurer (Utility) has to commit to procure all energy generated by a solar project up to a specified number of units of energy each year.
- The procurer has to pay for power that the plant could generate but which the procurer is unable to offtake

Curtailement risk

- Procurer must compensate the developer for any shortfall in offtake because of grid unavailability or any other reasons for back down

Payment Security

- Financial obligations of the procurer under the PPA need to be backed up with one or more tier of payment security mechanisms
- Mechanisms include Letter of Credit, Escrow Account/ Payment Security Fund, Government Guarantee and IFI guarantees

Critical features of Power Purchase Agreements to enable project finance (2/3)

Forex indexation of tariff to cover financial risks

- To mobilize international financing on attractive terms
- Chile contracts in USD, adjusted for US Consumer Price Index
- Egypt PPA - payment in Egyptian Pound but is partially indexed to USD.

Termination payments

- Procurer to pay in case of early termination
- Debt and Equity has to be compensated in cases of termination because of procurer default or force majeure
- Debt alone may be compensated in case of developer default

Compensation for Change in Law

- Any increase in costs or decrease in revenues of developer because of changes in law is to be compensated
- Lump sum payment or revision in tariff

Critical features of Power Purchase Agreements to enable project finance (3/3)

Cure Periods

- Adequate cure periods i.e. time to correct defaults by developer or procurer should be provided before termination can be triggered

Step-in or Substitution Rights of Lenders

- Lenders need rights to either substitute a defaulting developer or to themselves step into managing the project.

Allowing for uncertainty of technology

- Allow for a range of annual generation that is acceptable without penalties for low generation getting triggered
- Event of Default is triggered only if there is consistent breaching of lower limit of generation over multiple years

Applying these learnings in the Rewa Project (India) led to historic outcomes



“Our lenders outside India were happy with the project risk because of **government guarantee, presence of DMRC as a second procurer, payment security mechanisms** and other **contractual improvements**.”



“Inclusion of **deemed generation** was severely contested by procurers initially. The clause was added later as they realised the possibility of reduction in tariffs due to this clause.”



“We did not participate in the e-auction for Kadapa 250 MW NTPC bid due to the **risk of change in taxes under GST**. This risk was **addressed in Rewa**, allowing us to participate”.
“**Termination compensation** offered ... **was sufficient to cover our risk** in event of an actual termination but **more importantly acts as a deterrent** against default by procurers.”



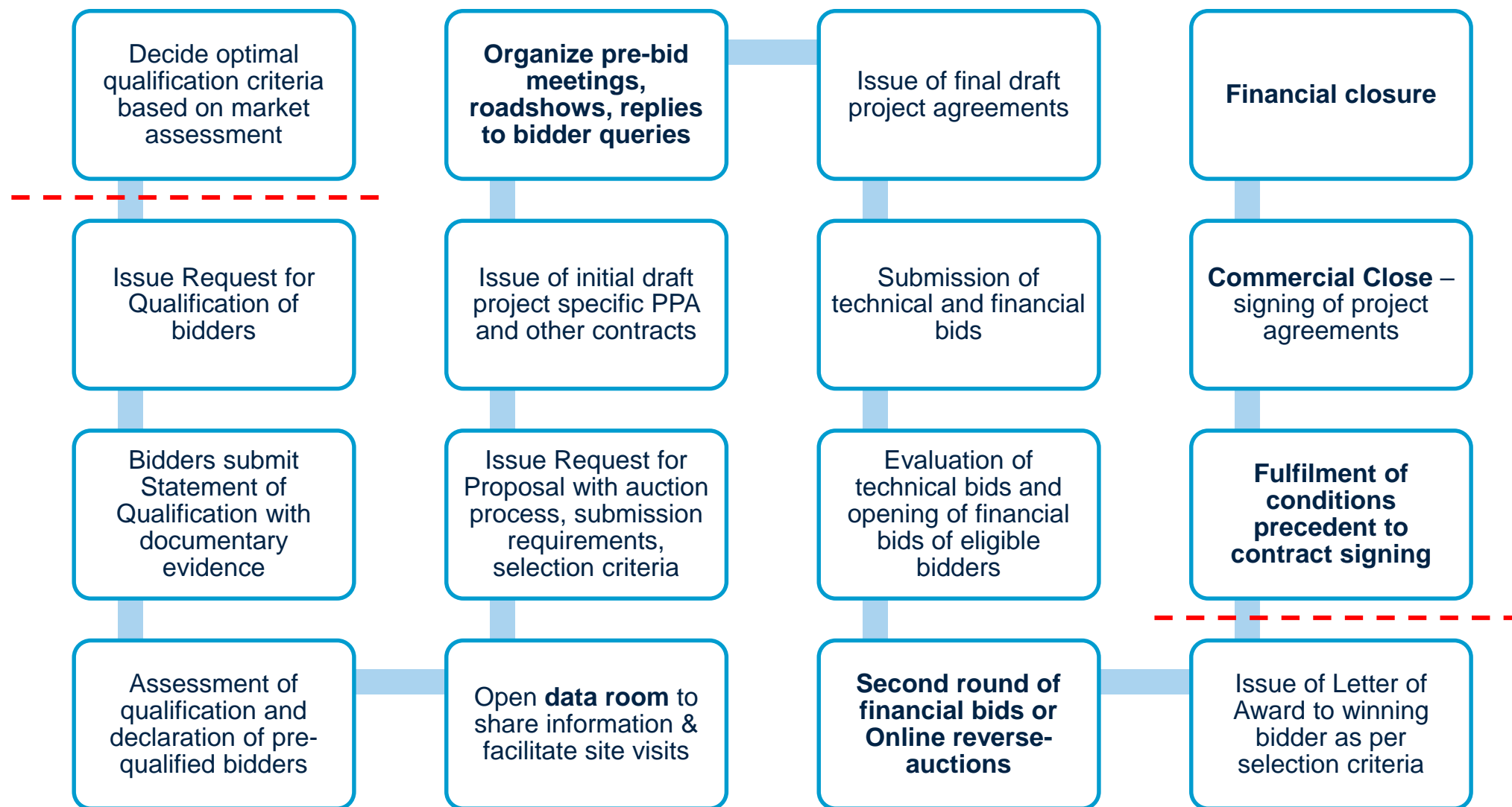
“As most risks have been mitigated ..., the cost of debt can be lowered by 25 to 100 bps.”



“**Timely handing of land** has a significant impact on risk ... lower risk perception can result in a 50-75 bps reduction in equity IRR expectations. Also, the presence of World Bank and IFC during the planning stage meant that **..environmental and social issues were addressed**. This will make it easier for developers to access ECB, further reducing cost of debt.”

- **IFC Transaction Advisory helped mobilize \$575 mn private investment**
- **WB loan to government of \$18 mn for evacuation including concessional CTF**
- **IFC Investment: \$128 mn loan to winning developers + \$309 mn commercial bank loans**

Preparation and structuring is to be followed by a robust auction process



Apart from project preparation & bankable PPA, the Rewa auction demonstrated the use of iterative price discovery through online auctions

*Iterative auction (on online auction platform) resulted in **further 16% reduction***

*Stage I competitive tender achieved **10% lower** than prevalent tariff in India, reflecting better structuring*

STAGE I, ENVELOPE 1: QUALIFICATION PROPOSAL

- Responsiveness Test
- Technical Criteria
- Net Worth Criteria
- **Qualified Bidders**

STAGE I, ENVELOPE 2: FINANCIAL PROPOSAL OF QUALIFIED BIDDERS

- Bid parameter is **Tariff per kWh**
- Responsiveness Test
- Elimination of two highest bids to identify **Eligible Bidders**
- Stage-I **Best Quote** identified

STAGE II: REVERSE AUCTION

- Eligible Bidders participate
- Bids start with Best Quote from Stage-I
- Bid to beat the Best Quote for each Unit
- Auction continues till no further bids are received
- **Selected Bidder** identified at end of auction

The auction, held after 5 road shows & pre-bid meetings reflected the buy-in by domestic and international investors and lenders.

Auctioning for utility scale storage: a flavor of how auctions can handle different technologies

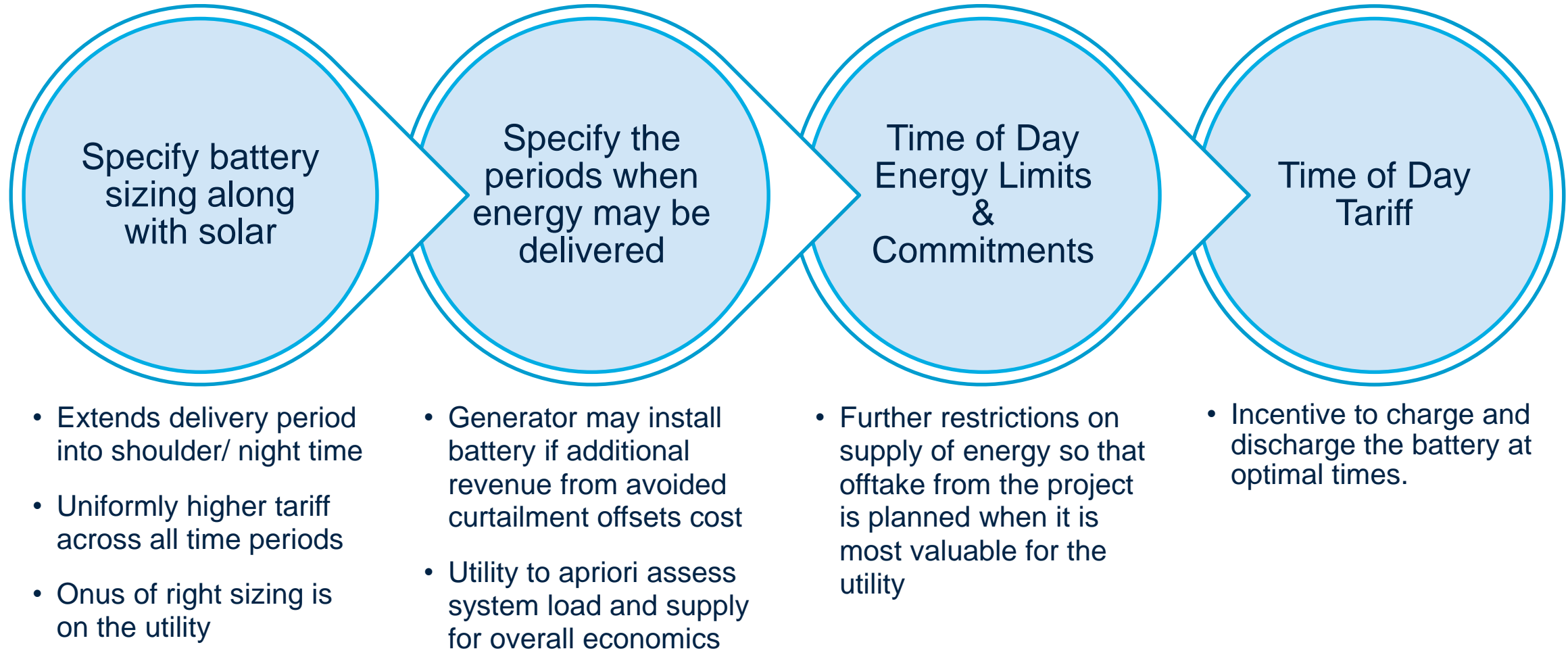
Utilities

- How to integrate solar in off-peak hours: shift solar power delivery profile to 2 - 4 hours later in the day
- How to control the delivery of power from solar plants to provide demand response and frequency regulation: create a market for ancillary services

Commercial & Industrial Users

- How to maximize energy savings and increase value of solar power assets
- Enhance basic behind the meter solutions to reduce demand when grid power is most constrained, i.e. shift solar power consumption (load shifting)

Auctioning for co-located storage (solar + storage i.e. S2): options to modify the “energy” PPA to incentivize investment in battery



A simple S2 energy contract is easier and less expensive. But as the utility cannot control the timing of deliveries, it cannot capture value for demand response and frequency regulation.

Auctioning for utility scale storage

Uptime Guarantee

(% of time system is fully operational)

- Agreed scheduled maintenance time to be excluded from calculation
- Defining damages due to breach (revenues lost?)
- Monetary liability caps for vendor/ manufacturer

Intellectual Property

- Identify the appropriate party to license or sub-license IP
- Ensure that the utility will have access to IP at all times during the life of the system, including if vendor/ manufacturer goes bankrupt.

Security for Payment & Performance

- Parent company guarantees or Performance Bond to back indemnity obligations and breaches of uptime guarantees

Force Majeure

- Contractual supply deadlines to be extended for any shipping delay

Indemnity & Insurance

- Careful negotiation of provisions in the event of a possible battery fire or other worst-case events

Conclusion: Points to ponder

Does auction necessarily involve iterative bidding?

Does iterative bidding necessarily require online auction platforms?

What is the advantage of adopting the standardized PPA approach of Scaling Solar?

What if the PPA does not follow internationally acceptable principles of project finance?

THANKS



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