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URJA NEPAL

LEADING PRACTICES IN INTERNATIONAL COMPETITIVE BIDDING

For the Ministry of Energy, Water Resources and Irrigation, Government of Nepal

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ACRONYMS

AC	Alternating Current
ADB	Asian Development Bank
ANEEL	Agencia Nacional de Energie Elétrica
BOO	Build-Own-Operate
BOOT	Build-Own-Operate-Transfer
BOT	Build-Operate-Transfer
BPC	Bid Process Coordinator
CAGR	Compound Annual Growth Rate
CAPEX	Capital Expenditures
CEM	Companhia Enérgetica Meridional
CERC	Central Electricity Regulatory Commission
COD	Commercial Operation Date
DC	Direct Current
DCR	Domestic Content Requirement
DoED	Department of Electricity Development
DPR	Detailed Project Report
EOI	Expression of Interest
EPC	Engineering, Procurement and Construction
ERC	Electricity Regulatory Commission
FC	Financial Closure
FDI	Foreign Direct Investment
FY	Fiscal Year
GMR	Grandhi Mallikarjuna Rao
GOI	Government of India
GoN	Government of Nepal
GW	Giga Watt
HIDCL	Hydropower Investment and Development Company Limited
HPPs	Hydropower Projects
ICB	International Competitive Bidding
IFC	International Finance Corporation
IFI	International Financial Institution
IPPs	Independent Power Producers
ITD	Italian-Thai Development Public Company Limited
JV	Joint Venture
JNNSM	Jawaharlal Nehru National Solar Mission
KEPCO	Korea Electric Power Company
kWh	Kilowatt Hour
LOI	Letter of Intent
MEMR	Ministry of Energy and Mineral Resources
MNER	Ministry of Energy and Natural Resources
MNRE	Ministry of New and Renewable Energy
MoEWRI	Ministry of Energy, Water Resources, and Irrigation
MoU	Memorandum of Understanding
MW	Mega Watt
NCEF	National Clean Energy Fund
NEA	Nepal Electricity Authority
NEPCO	National Electric Power Company

NPR	Nepali Rupees
NSM	National Solar Mission
OIBN	Office of the Investment Board of Nepal
PDA	Project Development Agreement
PPA	Power Purchase Agreement
PPPs	Public Private Partnership
PSA	Power Sale Agreements
PTCN	Power Transmission Company Nepal
PV	Photo Voltaic
QCBS	Quality Cost Based Selection
RE	Renewable Energy
RFQ	Request for Qualification
RFP	Request for Proposal
RfS	Request for Selection
RoR	Run-off River
SAPDC	SJVN Arun-3 Power Development Company
SECI	Solar Energy Corporation of India Limited
SJVN	Satluj Jal Vidyut Nigam
SPD	Solar Power Developers
SPV	Special Purpose Vehicle
TEAS	Turkey's Electricity Generating and Transmission Company
USD	United States Dollar
VAT	Value Added Tax
VGF	Viability Gap Funding
VUCL	Vidhyut Utpadan Company Limited
WB	World Bank
WECS	Water and Energy Commission Secretariat

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1. INTRODUCTION

Nepal's power generation depends primarily on run-of-river (RoR) hydropower projects (HPPs). Historically, Nepal has a power deficit, and for that reason, the country remains a net importer of electricity, except during the wet season. From fiscal year (FY) 2010 to FY 2018, Nepal's peak power demand grew at a Compound Annual Growth Rate (CAGR) of ~7 percent (from 885 Megawatts (MW) to 1,508 MW, before decreasing to 1,320 MW in FY 2019).[1,2,3,4,5,6,7,8,9,10] An increase to ~1408 MW was recorded again in FY 2020.[11] However, Nepal's domestic generation capacity remains inadequate to meet both existing and anticipated demand. Today, the demand-supply gap (illustrated below) is currently being managed through power imports from India, which in FY 2020 were in the range of 300 to 500 MW. [12] In FY 2021, Nepal Electricity Authority's (NEA) own generation contributed to 31.66 percent of the energy required, whereas imports from India and Nepal's domestic independent power producers (IPPs) accounted for 31.83 percent and 36.51 percent respectively. [13]

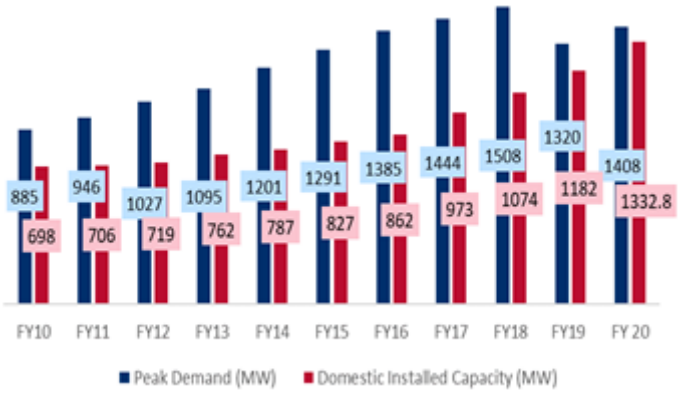

Figure 1: Demand Supply Gap FY10 to FY 20

The vast majority of Nepal's generation mix comes from hydropower, with a very small percentage being contributed by solar and thermal sources. Despite the nation's net importer status, the country is blessed with massive hydropower potential. The Government of Nepal (GoN) has estimated that the nation has more than 423 Gigawatts (GWs) of unexploited potential — only three percent of

[1] Nepal Electricity Authority. (2010). Annual Report for FY 2010.
[2] Nepal Electricity Authority. (2011). Annual Report for FY 2011.
[3] Nepal Electricity Authority. (2012). Annual Report for FY 2012.
[4] Nepal Electricity Authority. (2013). Annual Report for FY 2013.
[5] Nepal Electricity Authority. (2014). Annual Report for FY 2014.
[6] Nepal Electricity Authority. (2015). Annual Report for FY 2015.
[7] Nepal Electricity Authority. (2016). Annual Report for FY 2016.
[8] Nepal Electricity Authority. (2017). Annual Report for FY 2017.
[9] Nepal Electricity Authority. (2018). Annual Report for FY 2018
[10] Nepal Electricity Authority. (2019). Annual Report for FY 2019.
[11] Nepal Electricity Authority. (2020). Annual Report for FY 2020.
[12] Nepal Electricity Authority. (2020). Annual Report for FY 2020.
[13] Nepal Electricity Authority. (2021). Annual Report for FY 2021.

which (approximately 1.4 GW) has yet been tapped. Successive governments have regarded hydropower as being the obvious driver of Nepal's economic future because it is clean and abundant. It is widely held that the rational development of this abundant resource will easily close the current demand/supply gaps, provide for all domestic consumption – and also provide as much additional energy for exports as regional markets can support. While the information presented above seems to convey all good news, there are many challenges to be overcome if Nepal's natural gifts are to be transformed into a bright economic future.

The first challenge is financial. By their nature, hydropower projects (HPPs) are capital intensive, and Nepal's hydropower potential greatly exceeds the nation's ability to finance their development needs. The answer to the dilemma of how to grow the economy with inadequate supplies of domestic funding is easy to state, but less easily addressed. Put simply, Nepal must continue to improve its investment ecosystem in a way that attracts substantially more external financing resources than ever before. Because this problem is common among developing countries, there is a commonly applied solution – to attract Foreign Direct Investment (FDI) to close the financial resources gap in the domestic economy. FDI is perhaps the key concept in HPP development using internationally sourced funds, because through FDI, private developers not only arrange financing, but financing with additional benefits — leading international practices and technical expertise.

GoN has already taken the first important steps to attract FDI. In recent years, the GoN has awarded the 900 MW Upper Karnali HPP to an Indian private developer (GMR), by way of an International Competitive Bidding (ICB) process based on the Build-Own-Operate-Transfer (BOOT) Model. Although that project has not yet reached financial closure, when it does, it will be the Nepal's largest FDI project.

The first and perhaps the easiest step for Nepal to take, and which will immediately increase FDI in the energy space is to formalize and streamline the ICB practices across all GoN bodies concerned with procuring new generation capacity. ICB also provides the most efficient and transparent way for the government to determine which bid will provide the best value for money. In that respect, ICB when properly implemented, protects the interests of the government – the owner and steward of the assets; the developers – who are seeking transparent practices and predictability of results; and ultimately, the customers and end users – who are looking for reasonable services at reasonable prices. The key benefits of ICB for Nepal are set out below.

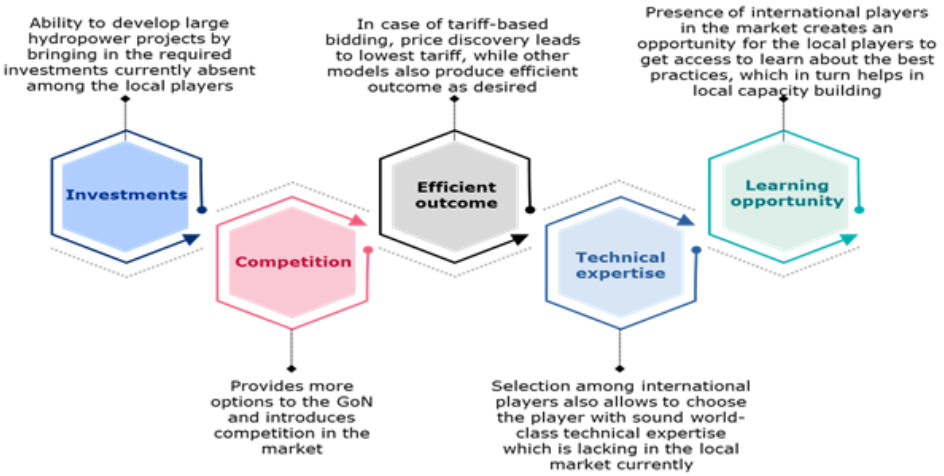

Figure 2: Benefits of ICB

This report is comprised of four sections. Section 1 provides a review of global experiences with ICB – including an analysis of multiple implementation models, including BOOT, Build-Own-Operate (BOO), and Build-Operate-Transfer (BOT). These models are supported by case studies from around the world which illustrate the distinguishing features as well as the advantages and disadvantages of each model. Procurement processes and bid evaluation models, including revenue shared-based and tariff-based models are also discussed in this section.

Section 2 describes Nepal's experiences with ICB, beginning in 1998 with the first project, and continuing through the present day. This section reviews many of those projects – including all of those which have reached financial closure (FC). It also describes the type of bidding model that was employed, the evaluation criteria, and identifies key learnings which should inform Nepal's approaches going forward.

Section 3 draws lessons from prior sections. This section includes a gap analysis of Nepali ICB practices and provides recommendations for actions that can be taken to close the most significant gaps in Nepal's procurement process. Recommendations include improving coordination among GoN administrative bodies; appointing a purpose-built bid process coordinator; improving the allocation of identified risks in selecting the project site and further project development; creating a regional market strategy; developing stable and predictable tariff policies, developing standard bidding/procurement documents, and implementing E-bidding procedures.

Section 4 follows on the recommendations in the previous section by presenting recommendations for action plans which can be used to address those gaps and by providing an additional plan to effectively promote and implement ICB in Nepal. The plans proposed include both high-level steps and the expected improvements for each of the gaps identified.

1.1 INTERNATIONAL COMPETITIVE BIDDING

The use of competitive bidding for electricity projects facilitates a fair, open, and timely procurement process, and reduces opportunities for rent seeking. In so doing, competitive processes minimize the likelihood of future challenges to the selection process and its outcome. ICB is defined as:

> *"Competitive bidding involves inviting multiple developers or service providers to submit offers for any particular material or service, which allows transparency, equality of opportunity and the ability to demonstrate that the outcomes represent the best value."*[14]

In most instances, competitive bidding is far superior to single sourcing, or bilateral negotiations, which often lack efficiency and are more likely to be challenged when political winds change. In addition, the non-competitive procurement methods also seldom provide a clear signal of the real cost of energy.[15]

ICB, as practiced throughout the world, is generally considered the most effective method for the procurement of power for a number of reasons – one of the most important being that it provides a

[14] GEP. (2021). Competitive Bidding. Accessible at: https://www.gep.com/knowledge-bank/glossary/competitive-bidding
[15] World Bank. (2021). Electricity Auctions: An Overview of Efficient Practices. Pg. 95. Accessible at: https://openknowledge.worldbank.org/bitstream/handle/10986/2346/638750PUB0Exto00Box0361531B0PUBLIC0.pdf?sequence=1&isAllowed=y

procuring body with a wide range of choices when selecting the best bid from competing suppliers and contractors. Formalized and transparent bidding is a competitive and efficient form of procurement of power from any generation source, including hydropower and renewable energy (RE).

1.2 IMPLEMENTATION MODELS

Competitive bidding processes, in order to be successful, require a significant amount of planning to identify and apply an appropriate project structure. These decisions will carry through and influence the bidding process as well as project implementation throughout the life of the project. No single ICB model fits every type of project. When selecting the right project model, it is important to consider and define multiple project features, including the size of the project, how it will be financed, the Capital Expenditure (CAPEX) requirement, a clear knowledge of the strengths and weaknesses of project sponsors, the types of procurement, and a profound knowledge of the risks that inhere in the procurement process, so that each can be allocated among the parties best able to shoulder and mitigate those risks. For the largest projects, the public sector may be the only source of finance, however if capital requirements and risks can be reduced, a corporate finance scheme might be appropriate.

Commonly encountered private sector-led implementation models for power projects are described below.

1.2.1 BOOT: BUILD-OWN-OPERATE-TRANSFER.

BOOT is the preferred implementation model for many types of power projects, including HPPs. BOOT is also often considered for use in infrastructure projects and public private partnerships (PPPs). Under a BOOT framework, an administrative body of the government assigns a number of tasks to a private sector entity – the project developer – including designing, building infrastructure, financing, and operating the plant for a fixed period of time.[16] During the life of the project, often extending for decades, the developer will be entitled to collect all project-generated revenues, which must be sufficient to cover the developer's financial obligations to the lenders, while also providing a reasonable return to the developer for the risks it assumes. At the end of the contract term, the project developer transfers (hands back) the facility to the administrative body of the government, at which point the project terminates. During the concession period, the developer or concession holder, also holds title to all the project's the assets.

[16] Asian Development Bank. (2007). Public Private Partnership Handbook. Accessible at: https://documents1.worldbank.org/curated/en/490511468331774007/pdf/624230PUB0Publ00Box0361478B0PUBLIC0.pdf

The principal advantages and disadvantages associated with the BOOT model are set out below:

Table 1: Advantages and Disadvantages of BOOT Model

Advantages	Disadvantages
• The public sector project sponsor can take advantage of the efficiencies and financing brought to the project by the private sector, and can amplify these benefits by extending incentives, including tax breaks, to the developer • The developer arranges for debt, which reduces the debt obligation of the sponsor • BOOT takes advantage of private sector know-how and innovation • BOOT allows the developer to showcase relevant expertise	• BOOT can have higher transaction cost • BOOT requires substantial operational revenues to be successful • Additional costs are incurred to pay a profit to the private sector service provider for the value of its knowledge and time in assembling the service delivery infrastructure

BOOT Case Study 1: 450MW Cana Brava Hydro Power Project, Brazil[17]

Brazil began its power sector reforms in the 1990s. Brazil's Law 8631 was passed in 1993 for the purpose of restructuring the power sector to encourage private investments. The previous tariff methodology was abandoned – meaning that each utility was required to propose a tariff, based on full cost recovery and a "reasonable return on investment". To further encourage private sector investments, in 1995 the legal framework was revised, with two new pieces of legislation: the Concession Law, which allowed private parties to supply public services; and the Independent Power Producer Law (IPP Law), which set the terms under which IPP concessions could be awarded – specifically, through a public bidding process for the award of a concession of up to 35 years. In 1997, to ensure supervision of the developer and to promote fair competition, the Agencia Nacional de Energie Elétrica (ANEEL) – the independent electricity sector regulator, was established. ANEEL, in addition to its regulatory obligations, was also given the mandate to conduct regulated procedures to award HPP concessions (for projects above 30 MW) and to issue the license required to develop the HPP site. The process that was used is set out below:

- The developer conducts a feasibility study and submits a non-price application to ANEEL
- ANEEL publicly invites offers from other developers
- After prequalification, the feasibility study is made available to all qualified bidders
- A period of four months is given to prepare full bids
- The winner is the bidder that provides the highest premium. If the winner is not the original developer, the original developer is reimbursed by the winning bidder for the cost of the feasibility study

17 Nile Basin Initiative, A Review of Private Public Partnership Models in Hydropower Projects. (https://entrospace.nilebasin.org/bitstream/handle/20.500.12351/262/A%20Review%20of%20Private%20%20Public%20Partnership%20Models%20in%20Hydropower%20Projects.pdf?sequence=1&isAllowed=y)

The 450 MW Cana Brava project was created in 1997, after a feasibility study had been completed. An international competitive bid was conducted in March 1998 and ANEEL awarded a 35-year concession contract to the Special Purpose Vehicle (SPV), Companhia Enérgetica Meridional (CEM), with Tractebel Energia SA as the main project sponsor. Because Brazil had already transitioned away from the single buyer model, Gerasaul, another private entity, was appointed to be the power off-taker. The project was commissioned in 2002, with a concession term of 35 years, at which time it was handed back to the Brazilian Government.

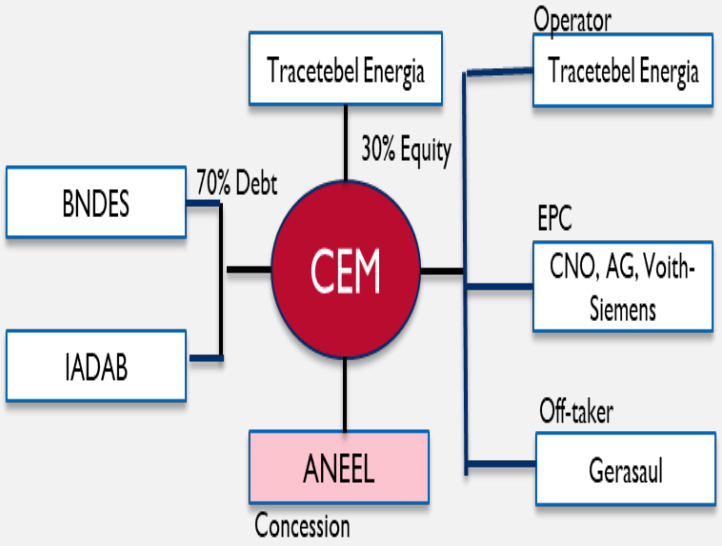

Figure 3: ANEEL's ICB Process

Key Learnings

This project provides the following key learnings:

- A seamless and enabling regulatory framework is the best way to foster competitive bidding under a PPP regime. Law 8631 was passed in 1993 to restructure the power sector and the Concession Law and the IPP Law were promulgated in 1995 and 1997 to facilitate private investment in Brazil's HPP sub-sector
- The establishment of ANEEL, the independent regulator, was also instrumental, as the regulator was required to oversee (manage) the country's competitive bidding for the electricity sector. In addition to its regulatory powers, ANEEL was mandated to award the concession and to monitor the bidding process
- To ensure the delivery of accurate market signals to investors, the obligations of the government related to project preparation were clearly set out in the tender documents. Site pre-feasibility studies were conducted, and all relevant hydrological data was shared with all prospective bidders
- The Power Purchase Agreement (PPA) signed by the developer and the government appointed buyer was bankable and the structure followed standard industry practices. All of these safeguards encouraged project developers and financiers to join the project

1.2.2 BOO: BUILD-OWN-OPERATE

Unlike the BOOT model described above, the BOO model includes no hand back of the asset to the host government at the end of concession term. Instead, the concession holder continues to own the asset together with any residual value. Typically, a BOO scheme involves very large investments and a long payback period.[18] The key advantages and disadvantages associated with the BOO model are set out below:

Table 2: Advantages and Disadvantages of BOO Model

Advantages	Disadvantages
• The developer retains all of the risks related to project design, construction, and operation • The BOO model promotes private sector innovation and value for money • The quality of operation and maintenance is usually improved • The BOO model increases the commitment of contractors and financiers alike to successfully operate the project • It reduces the chances of a developer using inappropriate or outdated technology	• Contracts are often complex • Effective project management and monitoring protocols must be in place to ensure implementation of the project according to the agreed upon timeline • If the operator is unable to perform, the result is sub-optimal utilization of resources, and there is a supplemental a cost to re-start the project

BOO Case Study 1: [19] 90 MW Fujeij Wind Farm, Jordan

Pursuant to Jordan's Renewable Energy and Energy efficiency Law (2010), the Ministry of Energy and Mineral Resources (MEMR) proposed to develop 90 MW Fujeij Wind Farm. Using the PPP structure, the project was developed under the BOO model using ICB processes. The project was awarded to the Korea Electric Power Co (KEPCO) in 2013 and reached financial close in late 2016. The project company, which held 27 Vestas turbines, signed a 20-year PPA with the Kingdom's National Electric Power Company (NEPCO).

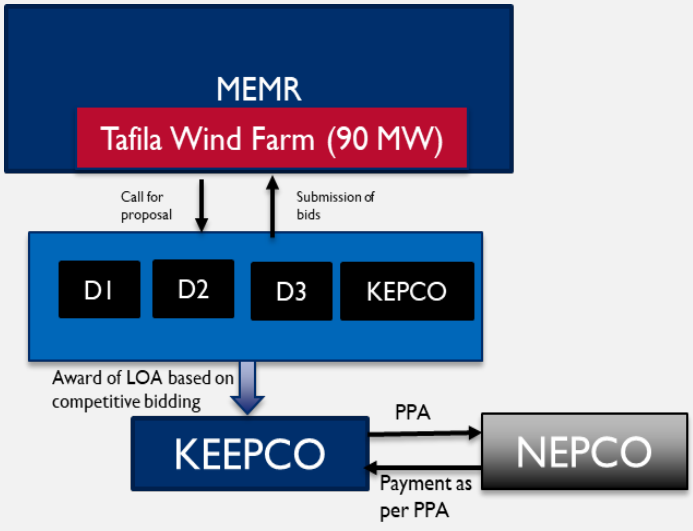

Figure 4: NEPCO ICB Process

[18] Grausam, A. BOT schemes as financial model of hydro power projects. Accessible at: https://inis.iaea.org/collection/NCLCollectionStore/_Public/28/074/28074244.pdf
[19] CUBE Engineering GmbH. (2013). Final Report of the Environmental and Social Impact Assessment Study (ESIA) of Tafila Windfarm. Rev 1. Accessible at: https://www.eib.org/attachments/registers/53221235.pdf

Key Learnings:
The key learnings from this case study include:

- A seamless and enabling regulatory framework is the best way to foster competitive bidding under a PPP regime. The Renewable Energy and Energy Efficiency Law (2010) provided the private sector access to the country's RE market
- The presence of a capable institutional oversight body (MEMR) also strengthened the competitive bidding process, giving confidence to project proponents
- To ensure the delivery of accurate market signals to the potential investors, the government took a strong role in project preparation. Site pre-feasibility studies were duly conducted by the project sponsor and with the assistance of International Finance Institution's (IFI) (which had been involved from the beginning), a financing scheme was put in place
- The PPA signed between the developer and the off taker was bankable and the overall project structure met standard industry practices

1.2.3 BOT: BUILD-OPERATE-TRANSFER

Project investments under BOT model are planned, financed, and constructed, directly or indirectly, by the developer that will implement the project using limited recourse financing. These projects are operated and maintained by the developer under the concession granted by the government sponsor. Under the contract, the power projects are generally guaranteed revenue under an agreed tariff under long-term power purchase agreements. At the end of the concession period, the project is handed back to the host government.[20]

Key advantages and disadvantages associated with BOT-based projects include:

Table 3: Advantages and Disadvantages of BOT Model

Advantages	Disadvantages
• The BOT model removes the pressure on the host government – both as to financing issues and associated expenditures arising from the project • The BOT model improves the national debt burden as well as the obligation to make interest payments • The BOT model also increases commitment from contractors and financiers alike to successfully operate the project	• Usually, a high pricing and tariff structure is needed in order for returns to be attractive • There is a need to expand the use of guarantees and legal agreements as pre-requisites for investment, and as such investment costs rise • If the project structure is not properly designed, there may be poor utilization of natural resources by the developer • Political instability may lead to inconsistency in the policy framework and could discourage investors

[20] Grausam, A. BOT schemes as financial model of hydro power projects. Accessible at: https://inis.iaea.org/collection/NCLCollectionStore/_Public/28/074/28074244.pdf

BOT Case Study 1: 672MW[21] of Birecik Hydropower Project, Turkey

Birecik is part of Turkey's $32 billion South Eastern Anatolia Project (known as GAP). The project operates on a BOT model under a Project Company, Birecik AS, which is responsible for completing the project and to operate and maintain the facilities. Turkey's Electricity Generating and Transmission Company (TEAS), the publicly owned utility company, took a 30% stake in the project company.

Turkey liberalized the electricity sector in 1986 through Law 3096, which recognized that organizations other than the public utility, TEAS, could establish and operate generation facilities. The law further provided for power sales to TEAS at a tariff agreed to with the Ministry of Energy and Natural Resources (MNER). At the end of the contract term (approximately 20 years), the project was handed back to the government at no cost. Danistay, Turkey's highest administrative court, was selected to regulate the concession-based contract. Further, to streamline the BOT contract, a new BOT law (Law 3996) was passed. Nevertheless, Danistay continued to provide approvals on the BOT contracts for HPPs involving the participation of private entities. Terms and conditions that apply to such agreements include:

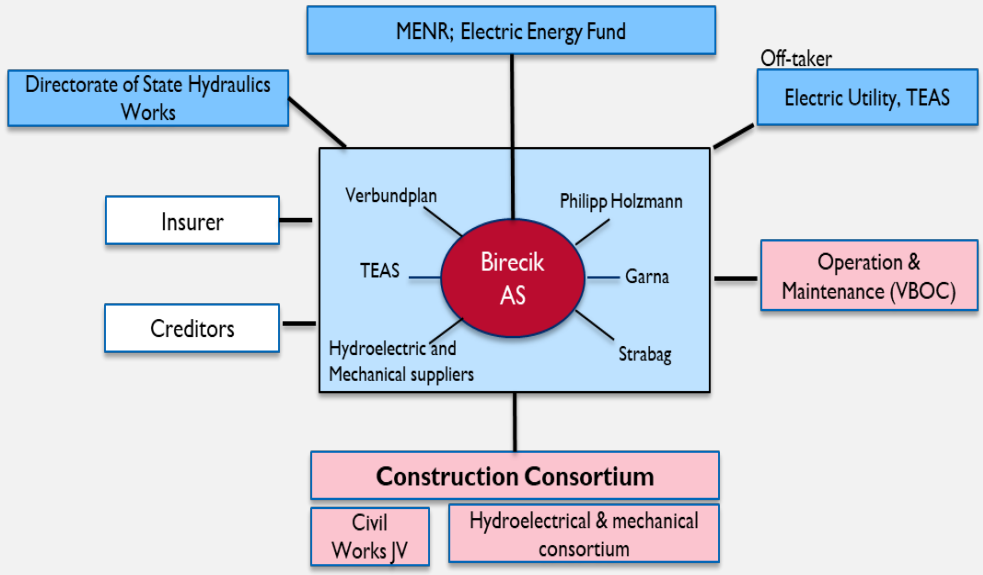

Figure 5: Birecik ICB Process

- The off-take contracts with TEAS are denominated in foreign currency but are payable in local currency with full convertibility
- There is no limitation of foreign ownership of the project company
- There is a take-or-pay obligation with full pass through to TEAS of hydro risk and unforeseen construction risk related to geology
- Certain fiscal incentives, including tax concessions and access to government loans were offered. When conducting a BOT tender, the government advertises the projects and invites proponents to participate in a prequalification process.

[21] Nile Basin Initiative. A Review of Private Public Partnership Models in Hydropower Projects. Accessible at: https://entrospace.nilebasin.org/bitstream/handle/20.500.12351/262/A%20Review%20of%20Private%20%20Public%20Partnership%20Models%20in%20Hydropower%20Projects.pdf?sequence=1&isAllowed=y

All pre-qualified bidders must purchase the full technical studies by MNER and prepare full technical and financial proposals during a period of 4-6 months. Each bidder is also permitted to undertake any additional studies that are relevant to prepare a responsive bid, at the bidder's costs. Bids are then evaluated based on the lowest average tariff, subject to technical compliance.

1.3 PROCUREMENT APPROACHES

1.3.1 PROCESS FOR INTERNATIONAL COMPETITIVE BIDDING

Host governments and their administrative bodies adopt competitive bidding procedures as one of the mechanisms to award a project to be developed under a PPP implementation model. ICB ensures fair competition among participating entities, and this further strengthens transparency. It is a well-tested method to provide best value proposals based on clearly established criteria. The typical bid process includes the following stages:

Figure 6: Typical Bid Process under ICB

A conventional ICB process for power projects is initiated by a procuring entity (usually an administrative or commercial arm of the government – which owns the asset) which elects to conduct either a single-stage or two-stage bidding process.

- In the single-stage bidding process, bidders submit two sealed envelopes contained in an outer single envelope
  One envelope contains the Technical Proposal (with technical and financial criteria details); the second envelope contains the detailed/Price Proposal. Initially, only the Technical Proposal is opened and evaluated by the procuring body. No amendments to the Technical Proposals are permitted during the evaluation process. Only the price proposals of bidders that meet the technical criteria (outlined in their Technical Proposal) are opened and evaluated.
- In a two-stage bidding process, the initial stage is typically a 'Request for Qualification (RFQ)' which establishes financial and technical capability of the bidders
  This is followed by a 'Request for Proposal (RFP)' stage in which the shortlisted bidders from the RFQ stage submit their detailed proposals for the project itself.

1.3.2 EVALUATION CRITERIA FOR PRE-QUALIFICATION

It is important to note that irrespective of the bidding process used by the government's procuring body, the criteria used to evaluate the technical proposal will include the following:

- Technical Criteria: The technical qualifying criteria focus on the key technical capabilities which must be met by the prospective bidders
  In cases where a consortium is allowed, the technical criteria can be required to be met by the lead member, or jointly by the consortium. Typical parameters considered when developing qualifying technical criteria often include:

  i. The bidder's past experience in developing the specified power technology (solar, hydro, etc.) over a stipulated time-period
  ii. Sometimes, the defined value of projects developed and commissioned within stipulated time period is also considered for qualification
  iii. Occasionally, technical criteria will require an impeccable track record of infrastructure development, including conventional power projects, ports, refineries which will depend on the market maturity of the country sponsoring the project and the availability of capable HPP developers

The advantages and disadvantages associated with adopting such stringent technical criteria include:

Table 4: Advantages and Disadvantages of Technical Criteria

Particulars	Advantages	Disadvantages
Past experience in the power generation sector	• It ensures a large enough pool of similarly strong bidders and avoids players not in the power generation space • It encourages serious power developer participation • It provides clear and simple criteria	• Project scale is not calibrated as an evaluation criterion – therefore, small developers with limited or no experience in developing large scale power projects could leverage this. • It is often leveraged by the lead member of consortium to secure the bids. The lead member then leaves the consortium once the lock-in period is finished, even while the project is still in the construction phase.
Past experience of developing power generation projects of	• Ensures participation of highly committed players from the power generation space • It attracts true-cost bids as much as possible	• It is often leveraged by the lead member of consortium to secure the bids. The lead member then leaves the consortium once the lock-in period is finished, even while

Particulars	Advantages	Disadvantages
stipulated value and size		the project is still in the construction phase
Past experience of developing projects in distinct infrastructure sectors	• It brings a diverse set of infrastructure experience from bidders in contention • It provides a level playing field to diverse set of bidders • It avoids bidding constraints such as minimum project value requirement for projects	• It could also allow for the entry of non- serious players with limited or no knowledge of hydro sector.

- Financial Criteria: The financial qualifying criteria highlight the key financial capabilities of the bidder, which must be met by the prospective bidders interested in developing the project

  Typical key parameters for developing qualifying financial criteria may include:

  i. Annual Turnover: Indicates the size of the bidder's operation, and provides information related to sales realized, that is, payments received for contracts completed or in progress for Engineering, Procurement and Construction (EPC) firms and / or, revenue from existing projects for developers
  ii. Net Worth: This indicates the financial strength of the entity (what it worth), and a positive net worth indicates that the assets outweigh the liabilities, which is desirable

The advantages and dis-advantages associated with adopting financial criteria such as these include:

Table 5: Advantages and Disadvantages of Financial Criteria

Particulars	Advantages	Disadvantages
Annual Turnover	• It provides information about the scale of operations and how much revenue the entity is generating from sales • Also, year-on-year turnover provides insight regarding the growth in operations. As such, generally turnover is requested for a limited number of years (e.g., 3 years) • Simple criteria – preferred when greater participation in the bid is expected	• Does not indicate the financial health of the entity but only provides information about the scale of the business • Provides no information about liabilities
Net Worth	• Positive and increasing net worth indicates good financial health • Ensures bidding entity having adequate capacity to invest in the proposed project	• Developers can have high turnover but low Net Worth – local market need to be analyzed • May limit participation

Particulars	Advantages	Disadvantages
	• The lead entity in the consortium can request to meet net-worth criteria or consortium as a whole • The net-worth requirement can be defined (at least 20-25 % of investment required)	

1.3.3 TENDERS (REQUESTS FOR PROPOSALS)

Competitive solicitations are widely used in the electricity industry for power procurements — to encourage competition between project developers, and to secure lowest possible project costs. Tendering includes competitive formal processes in which the procurement agency issues a request for proposal (RFP), collects, and evaluates qualifying bids, and signs contracts with winning bidders. This approach typically involves contract negotiation, either with the highest-ranking bidder or with a short list of bidders. In the tendering process, weightings are given both to price and non-price criteria to arrive at a composite score for the bidders. The bidder with highest score prevails. In some parts of the world, it is also known as Quality Cost Based Selection (QCBS) tendering.

Competitive solicitations are central to electricity procurement in most regulatory environments and may provide utilities with some flexibility and control over the type, size, and timing of renewable additions to a utility system. However, the tendering process may have significant administrative costs associated with the length of the solicitation and contract negotiation process. The relative advantages and dis-advantages of tenders are set out below.

Table 6: Advantages and Disadvantages of Tenders

Approaches	Advantages	Dis-advantages
Pricing/Cost recovery	• RFPs contribute to achieving competitively priced projects, the respondents reflect the current and prevailing market prices	• Underbidding or adventurous bidding is evidence of non-serious participants, and can skew responses
Efficiency in contracting process	• Bid conditions are designed considering the requirements of the procuring body. At times the bid process can be broad enough to engage multiple parties and to attract serious players • The procurement agency can ask bidders to submit standardized documentation – this can reduce the time and expense of evaluating bids	• In regulated markets, solicited bids introduce significant administrative burdens (on both procuring agency and regulator) to issue RFP, evaluate bids, negotiate contracts, and seek necessary regulatory approval • The timing of an RFP may not be well timed and as such, deter investor interest

Approaches	Advantages	Dis-advantages
Decision making by procuring agency	• RFPs allow for non-price factors to play a significant role in the process. • The procurement agency can tailor the issuance of RFPs in a way that encourages bidders to submit project proposals that fit the agency's requirements	• Multiple complex considerations for large-scale generators (e.g., transmission requirements, siting, permitting, ownership structure), which may require careful examination on the part of the sponsor and the regulator, may require additional time

1.3.4 BILATERAL CONTRACTS

Under the bilateral contract approach, contracts for new power generation capacity are developed and signed by the parties without using an official competitive solicitation. Bilateral contracts are private, two-party contracts in which either party (the developer or the utility/procurer) can initiate the bi-lateral relationship. In the regulated market regime, bilateral contract negotiation may occur on a case-by-case basis if the buyer solicits a bid from a particular developer or if a developer approaches the buyer with a proposal to develop new electrical capacity within a utility's service area. Further, if the buyer is the utility, the approval on the bilateral contract often needs to be secured from the electricity regulator. Using the bilateral contract negotiation approach, utility buyers can shop around for the best price without the formality of an RFP. If utilities find that the proposals are of reasonable cost and feasibility and are desirable additions to their generation mix, they may pursue bilateral contract negotiations. Also, the time taken to sign a bilateral contract is less than that of a solicitation. However, the lack of market competition that is inherent in the process is a catalyst for collusion among suppliers could limit the effectiveness of the bilateral process.

The relative advantages and dis-advantages of the bi-lateral contract model are set out below:

Table 7: Advantages and Disadvantages of Contracts

Approaches	Advantages	Dis-advantages
Pricing/Cost recovery	• Power Purchase Agreement (PPA) terms are flexible and subject to negotiation	• It does not guarantee a lower cost PPA • Pricing is not set competitively and does not necessarily protect the interests of consumers
Efficiency in contracting process	• Negotiation is only between two parties, contracting could be more efficient	• Individualized contracts may take longer to negotiate and approve than standard offer contracts • An iterative process may be needed to settle on PPA terms and conditions

Approaches	Advantages	Dis-advantages
Decision making by procuring agency	• Bilateral contracting allows flexibility in accepting or rejecting the offer based on resource planning needs	• Under recovery of costs is a risk

1.3.5 AUCTIONS

Power procurements can also be made by way of an auction process. Developers bid into the auction under a formal auction framework — expressing a willingness to sell a given product at a given price, soliciting from the counterparties their willingness to buy at that price. Auctions are similar to RFP processes, the difference being that auctions generally rely on the price criterion only after bidders are qualified. Eliminating all non-price bid factors, procurement agents obtain a pared-down competitive process, which may take significantly less time to carry out. The advantages and disadvantages of the auction process include:

Table 8: Advantages and Disadvantages of Auctions

Approaches	Advantages	Dis-advantages
Pricing/Cost recovery	• Auction results in market-based price recovery	• Under-bidding may be a problem if financial repercussions are not strict
Efficiency in contracting process	• Contracts resulting from auctions are standardized and non-negotiable	• It may be difficult to ensure that there is homogeneity and liquidity in the market
Decision making by procuring agency	• Auctions can be structured to obtain particular types of generation products (e.g., baseload and peaking)	• There is potential for price and supply risks

Internationally, power project auctions take place under the following three models:

i. Sealed Bid Auctions

This is the most common type of auction for power projects, in which qualified bidders simultaneously submit their bids with an undisclosed offer of the price per unit of electricity and the MW capacity to be allotted. If the evaluation is based only on the price term, bids that meet all the requirements set out in the call for tenders are ranked from the lowest to the highest price. Bids are ranked and the project capacity incrementally is allotted to bidders until the targeted capacity is reached. A sealed bid auction can be conducted in two phases – the first phase being, in effect, a prequalifying round to select eligible bidders. This may help screen bidders based on certain desired criteria, including financial capability to execute the project.

Key advantages and dis-advantages associated with sealed bid auctions are set out below:

Table 9: Advantages and Disadvantages of Sealed Bid Auctions

Advantages	Disadvantages
• It is perceived as straightforward process by the bidders and lowers the cost of participation • It selects quality bidders according to the technical/pre-qualification requirements • It is simple and easy to implement • It limits cartelization among participating bidders, as price bids are not disclosed. • Generators are guaranteed that their electricity has a buyer as well as access to the grid, in line with the terms of the PPA	• Non-serious bidders who are not capable of executing the project can quote non-realistic bids • Unrealistic bids may result in delay financial close from lending institutions, leading to delay in commissioning of such projects • It requires stronger institutional capabilities • Bidders face risk of not being awarded and sunk cost of project predevelopment

ii. Reverse bidding

This type of auction is conducted in multiple rounds, where the first bid starts with a high price and progressively drops until the capacity offered matches the capacity to be procured. This is a more dynamic process where bids are disclosed between participants. Under this approach, bidding takes place over several rounds. Bidders can observe the development of the auction price and competing bids and adapt their bidding strategies and bids during the auction process. Key advantages and disadvantages of reverse bidding include:

Table 10: Advantages and Disadvantages of Reverse Bidding Auctions

Advantages	Disadvantages
• It allows for rapid price discovery, thereby introducing a high level of efficiency • The process is transparent • Since winning bidders do not have to disclose the lowest price, they are willing to bid. As such, it encourages participation	• Bidder collusion is a risk • Unrealistic bids may delay financial close from lending institutions, leading to delay in project commissioning

e-Reverse Bidding Case Study[22]: Bidding for solar projects to be developed in Solar Park under National Solar Mission (NSM) Phase-II, Batch-IV India

The solar park auctions conducted by the Solar Energy Corporation of India Limited (SECI) under the National Solar Mission (NSM) Phase-II, Batch-IV India, adopted the process of e-reverse auctions. After a techno-commercial evaluation, an e-reverse auction was conducted for the total project capacity which was conducted through an online portal. Shortlisted bidders after the

[22] MNRE, Government of India

financial opening round were able to login 15 minutes prior to the start of the auction. Respective tariffs of the bidders were displayed on its window. Bidders could mention their revised discounted tariff which had to be at least 1 (one) paisa or 0.10 cent less than its current tariff. The initial auction period was for one hour, with a provision of automat extension of eight minutes. Bidders were selected in ascending order with the lowest quoted tariff (being L1) and so on, until the capacity was exhausted. The lowest quoting bidder was allotted its qualified project capacity, followed by allotting capacity to the next higher bidder until the total eligible project capacity was exhausted. At the end of selection process, a letter of Intent (LOI) was issued to the successful bidders for each project

iii. Hybrid Auctions

There is also a two-phased approach for hybrid auctions, which includes a reverse bidding round to discover the ceiling price and a second, tariff-based auction to discover the lowest price and eligible bidder. The reverse bidding auction that results in the supply being met within a certain margin, allows the discovery of the price ceiling and the second stage is the tariff-based auction that is held to meet the actual demand at the lowest price.

Hybrid Auction Case Study: Hybrid Auction of Brazil[23]

Brazil has implemented a hybrid auction where the first phase is a descending clock auction that results in the supply being met within a certain margin. The second stage is a sealed-bid auction which is held to meet actual demand at the lowest price. In the case of Brazil, the use of a hybrid auction aims to take advantage of the benefits of both auction systems: price discovery in descending clock auction – as it has proven to be effective in determining the ceiling price for bids; and no collusion between small numbers of participants for setting the final price in sealed-bid auction.

1.4 EVALUATION MODELS

1.4.1 EVALUATION CRITERIA

Two possible approaches for the evaluation of power projects include the cost-based selection approach and the Quality Cost Base Selection (QCBS) approach. For the cost-based selection approach, the parameters are tariff/revenue share/VGF based on the bidding model. Under the QCBS approach, the same parameters are considered, with additional nuance included by weighting each parameter and assessing the technical and financial capability of the bidders. In the cost-based selection model, the technical and financial capability of the bidders are only relevant for the pre-qualification process. Bidders selected during the pre-qualification stage, are only allowed to place their financial bids in line with the bidding parameters.

[23] International Renewable Energy Agency. (2013). Hybrid Auction in Brazil. Accessible at: https://www.globalccsinstitute.com/archive/hub/publications/138168/Renewable-energy-auctions-developing-countries.pdf

Some of the key selection parameters, including revenue share, one-time premium, tariff and VGF are discussed below.

1.4.2 REVENUE SHARE BASED BIDDING & EVALUATION

For hydropower projects, sites are owned by the sponsor (the host government) and offered for the site's optimal development. To account for the use of publicly owned natural resources, the project developer is required to make royalty payments to the host government. The royalty payments are from the project revenues and paid to the host government – either in the form of free power or free equity offered as a token for project participation. HPP development affects local people, many of whom may require resettling and re-habilitation. The revenue sharing model ensures that the host government is entitled to realize revenue from the project for local area development and to mitigate the hardships of the affected people. Also, HPPs are site specific and as such, project works greatly depend on geological, topographical, and hydrological considerations. Under this approach, the risk of unanticipated site conditions is ever present. As such, often it is not possible for projects to commit to a specific generation tariff. This is especially true for HPPs where, even if a site is pre-identified, geological, hydrological, and environmental uncertainties may preclude a developer from being able to commit to a generation tariff. It should be noted that while the bidding forms described above are not confined to a specific generation technology, they are most applicable to hydropower projects.

Bids under a revenue sharing model are typically based on the following, or a combination of these, parameters:

1. A percentage of energy generation to be delivered to host government, as free energy/royalty
2. A percentage of free equity for host government in the generation project

* *Host government may also designate national power utilities or state-owned entities to play its role in these arrangements.*

i. Free Energy based bidding: This is one of the variants of the revenue sharing-based competitive bidding process, in which the project developer offering the maximum amount of free energy to the host government is awarded the project
The free energy component is used as the bidding variable offered by the project developer and the bidder offering the highest free power to the host government will be successful. The free energy component can be staggered or increasing over the project life.

The following table illustrates the pros and cons of the 'Free energy' based bidding model:

Table 11: Advantages and Disadvantages of Free Energy Based Bidding Model

Advantages	Disadvantages
• Outflow is linked to the actual project performance and therefore provides more comfort to both the developer and lender in accepting the terms – as such, it can offer more to the host government • Since the bidder offering the highest percentage of free power will prevail, the evaluation process is straightforward	• Upfront fees are not maximized; rather they are based on free power, which will be received over the life of the project, after project construction • The host government secures free power as royalty and additional funds for local area development – this significantly affects project viability and may lead to cash flow problems, especially in the initial years of

Advantages	Disadvantages
• This is a time-tested bidding model in the Indian sub-continent	operation. This raises concerns of the project lenders / financiers.

ii. Bidding based on percentage of free equity: This is another variation of the revenue sharing-based competitive bidding process, in which the project developer that offers the highest amount of equity to the host government will be successful

The equity share is also considered as the royalty to the host government for use of the natural resources. The free equity component is used as the bidding variable offered by the project developer and the bidder offering the highest free equity to the host government will prevail. The following table illustrates the pros and cons of the 'Free Equity'-based bidding model:

Table 12: Advantages and Disadvantages of Bidding Based on Percentage of Free Equity

Advantages	Disadvantages
• The evaluation process is straight forward, as free power and the one-time premium is fixed, while developer offering highest equity is selected • Provides flexibility to host government to allow project developer to sell the free power in lieu of committed equity	• Selling free power committed for host government in lieu of the free equity in the open market is often seen as an option However, securing firm market for selling free power is challenge and does not guarantee constant 'revenue streams' • The host government acting as equity holder in the project may add operational complexities to private developers

Revenue-Sharing Case Study: Hydropower project in Himachal Pradesh bided as maximum percentage of free power[24]

Under the Government of India's Hydro Power Policy, 2008 and the Competitive Bidding guidelines prescribed by Ministry of Power, the Government of India (GoI) and further endorsed by Central Electricity Regulatory Commission (CERC), 17 hydropower projects totaling 1325 MW were taken up for bidding under the BOOT model in 2011. The site was identified by the Department of Energy, Government of Himachal Pradesh, India for hydropower development. The pre-feasibility reports were shared with prospective bidders, while the bidding criteria was the maximum amount of free power which could be provided to the host state government by the participating bidders. Also, under the bidding documents, the successful bidder was required to provide the quantum of free

[24] ASSOCHAM India. (2017). hydropower development in India for sustainable energy security. Accessible at: https://www.pwc.in/assets/pdfs/publications/2017/accelerating-hydropower-development-in-india-for-sustainable-energy-security.pdf

power in increasing manner with the passage of concession period of 40 years, viz. 13%, 19% and 31% free power to be provided till 12th year, 30th and 40th year respectively.

Free Equity Case Study: Hydropower projects in Arunachal Pradesh, India bided as maximum equity offered in the project to host state government[25]

In view of Competitive Bidding guidelines prescribed by Ministry of Power, GoI, and further endorsed by the CERC, 130 hydropower projects totaling 38,613MW were taken up for bidding under the BOOT model from 2006-09. The sites were identified by Government of Arunachal Pradesh, India for HPP development. The pre-feasibility reports were shared with prospective bidders and the bidding criteria was maximum amount of equity in the project which is to be offered to the host state government by the participating bidders. Bidders providing maximum equity in range of 11% to 26% were selected for project implementation.

Key Learnings:

- Policy and regulatory certainty were the key feature of the HPP ICB space in India which took place in multiple Indian states. The Ministry of Power Competitive Bidding procurement guidelines of 2005 and Hydro Power Policy of 2005 played pivotal role in development and implementation of hydro power project in desired transaction structure while CERC's endorsement of Standard Bidding Documents provided clarity to developers from regulatory viewpoint
- Engagement of Department of Energy in Himachal Pradesh and Power Department of Arunachal Pradesh ensured government's commitment to implement the project under the PPP mode while adoption of standard bidding documents by the agencies provided correct market signals to investors
- The Department of the Energy and Power Department in Himachal Pradesh and Arunachal Pradesh respectively were responsible to prepare the pre-feasibility studies, and anchoring of the entire bid process
- Bid documents were robust with clear a demarcation of responsibilities and risk sharing among participating stakeholders

1.4.3 BIDDING BASED ON ONE-TIME PREMIUM

Instead of a revenue sharing-based bidding process, host governments sometimes prefer another method: receiving a one-time premium, to be paid by the selected bidder. This model insulates the host governments from construction and operation risks, as they are assured of the receipt of a pre-determined amount of revenue from the bidder ultimately selected to develop the project. The payment of a one-time premium is also a variation of royalties paid by the successful bidder/developer to the host government for providing concession rights to develop the natural resources. In fact, the bidder offering the highest one-time premium to the host government is awarded the project. This model is predominant in the auctions for existing projects, where the right to operate, the project is

[25] ASSOCHAM India. (2017). hydropower development in India for sustainable energy security. Accessible at: https://www.pwc.in/assets/pdfs/publications/2017/accelerating-hydropower-development-in-india-for-sustainable-energy-security.pdf

transferred to a new concessionaire upon payment of the one-time premium. However, it is can also be used for new projects. Key advantages and disadvantages associated with this bidding model are set out below:

Table 13: Advantages and Disadvantages of Bidding Based on One-Time Premium

Advantages	Disadvantages
• It allows the host government to maximize the upfront fee • The host government selects the bidder offering the highest upfront fee, and therefore receives the revenue or amount rapidly • It is easier to evaluate • It ensures commitment from serious players who have extensive experience in the hydro space • It is a tried and tested model in Indian sub-continent	• Developer might be unwilling to provide high amount of upfront fee • Developer will have limited visibility into the final project parameters and project performance before detailed feasibility report preparation and therefore, this option may pose higher risk to the developer • Since the upfront fee must be paid to host government following execution of 'Concession Agreement', the project developer has limited oversight and understanding of project viability • Lenders perceive projects to be developed under this model to be risky, as there is no cashflow before the project completion, affecting project financials and viability

Exhibit 6: One-time premium-based bids undertaken by Brazil

For existing HPPs whose concession period has expired, Brazil employed competitive bidding to select a new concessionaire. The bidders were required to offer a premium on the offered minimum bid value for each project asset, and whoever bid the highest premium would receive a 30-year concession. From the power plant, 70% of the power supply is earmarked for the regulated market and the remaining balance for the non-regulated market. For example, in September 2017, Chinese and European energy firms were awarded four hydroelectric concessions in one of Brazil's largest auctions for electricity assets.

- 1.7 GW Sao Simao HPP, by SPIC Pacific Energy (an affiliate of China's state-owned State Power Investment), which offered a 6.5% premium on the minimum bid value of United States Dollars (USD) 2.12 billion
- 424 MW Jaguara HPP, by Engie Brazil Energia, which offered a 13.6% premium on the minimum bid value of USD 0.6 billion
- 408 MW Miranda HPP, by Engie Brazil Energia, which offered a 22.4% premium on the minimum bid value of USD 0.41 billion
- 380 MW Volta Grande HPP, by Enel, which offered a 9.8% premium on the minimum bid value of USD 0.41 billion

1.4.4 TARIFF-BASED BIDDING & EVALUATION

In this model, the key bidding parameter is the generation tariff offered by the developers, with the most attractive bidder offering the lowest tariff. The government sponsor may sometimes choose to specify a ceiling tariff for the bids. This form of bidding is more prevalent in renewable energy power projects in comparison to hydro power projects.

After shortlisting the bidders based on the pre-qualification evaluation in the RFQ stage, the procuring entity requests detailed proposals from the bidders for project implementation through a Request for Proposals (RFP). The selected bidders submit a bank guarantee for bid security, legal documents including power of attorney for consortiums or joint ventures (JV), and a financial bid (a tariff price). The bidder quoting the lowest tariff is selected. If there are multiple bidders with the lowest tariff, the RFP dictates a clear procedure for selection. The key advantages and disadvantages of tariff-based competitive bidding include:

Table 14: Advantages and Disadvantages of Tariff Based Competitive Bidding

Advantages	Dis-advantages
• It provides flexibility to developers on internal operations while ensuring certainty on availability of power and tariffs for buyers • It enhances standardization for bidders and reduce ambiguity and hence time for materialization of projects • It protects consumer interests by facilitating competitive conditions in procurement of electricity • It brings uniformity in tendering process for host government agencies which further facilitates investment • The host government chooses the bidder who offers the lowest possible tariff (keeping other variables like upfront fee, free power as constant) • Easier to evaluate	• Competitive bidding may lead to low price discovery, but at times the discovered tariff could be un-realistic, reducing bankability of the projects • Non-serious players, with limited prior experience, could be selected if tariffs are the only criteria used. This may lead to project missing the completion milestones and hence delay in project commissioning

Tariff-based Bidding Case Study: SECI- Kadapa Solar Park (Andhra Pradesh), India

The Solar Energy Corporation of India Limited (SECI), a Government of India (GoI) entity under the Ministry of New and Renewable Energy (MNRE), carried out auctions for the 750MW Kadapa solar park. Back-to-back Power Sale Agreements (PSAs) were executed by SECI with the State Buying Utilities for sale of solar power to them. The successful bidders (SPDs) would sign a 25-year PPA with SECI.

Prospective bidders interested in participating were required to submit their project proposals in response to the Request for Selection (RfS) document. Following the eligibility check criteria, SECI completed a techno-commercial feasibility assessment and ranked all the bidders. Evaluations of Techno-Commercially qualified Bids were done based on the "First Round Tariff Bid" quoted by the bidders in the Electronic Form of Financial Bid.

After this step, SECI invited the shortlisted bidders for the e-Reverse Auction. At this stage, SECI evaluated each Project based on the tariffs quoted by bidders, required to be less than the limit set for the RFS (which was 3.97 US Cents/kWh). If there were bids with tariffs higher than 3.97 US Cents/kWh, they were disqualified. Next, an e-reverse auction for the total project capacity was conducted through an online portal. Through the e-reverse auction, the three strongest bidders were each allocated 250 MW of capacity. The final tariff came down 3.66-3.67 US Cents/kWh.

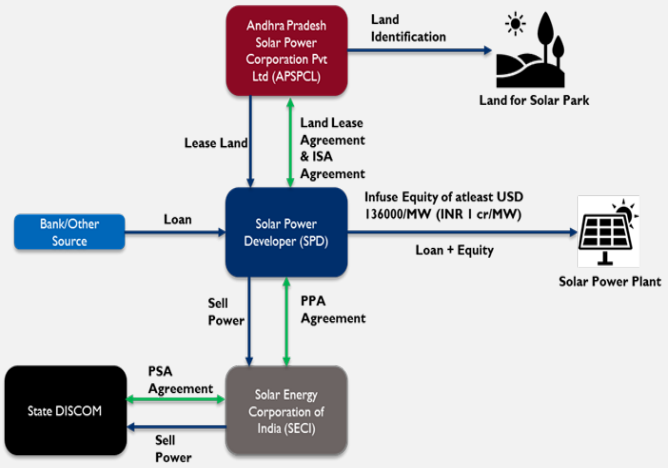

Figure 7: ICB Process of SECI-Kadapa Solar Park

At the end of selection process, a letter of Intent (LOI) was issued to the successful bidders for each Project. SECI concluded a 25-year PPA with the successful bidder.

Key Learnings:

This project provides the following key learnings:

- Conceptualizing National Solar Mission by GoI was the cornerstone in enabling private sector participation in the renewable energy sector of India
  Further, the Government also prescribed Competitive Bidding Guidelines for Renewable Power in 2019 to foster PPP and competitive bidding in the sector, pursuant to the Electricity Act 2003.
- The presence of robust Institutional structure in the form of Ministry of New and Renewable Energy (MNRE) and its affiliated agency-Solar Energy Corporation of India (SECI) was also instrumental towards creation of right oversight in direction of competitive bidding in the country
- To ensure correct market signals to the investors, project preparation on the government side was essential – and achieved
  Pre-feasibility of the sites was then undertaken at respective states where Solar Park was to be established and the issue of land availability was resolved
- SECI was required to procure the power from developer at a defined PPA rate and thereby sell it to distribution utilities across multiple states
  With good credit rating, SECI was preferred as contracting party by international developers.

1.4.5 VIABILITY GAP BASED FUNDING

In viability gap-based funding (VGF), bidding is based on the lowest demand of bidders for viability gap funding. VGF is especially useful when a specific technology needs to be promoted although it lacks commercially viability in the current market. Viability gap funding was adopted in the early years of solar PV when the cost of solar power generation was higher than existing power purchase costs of utilities. For example, India executed one of the largest examples of VGF-based bidding in 2014, for

750 MW solar power capacity under batch one, phase two of Jawaharlal Nehru National Solar Mission (JNNSM).

Viability Gap Funding Bidding Case Study: 750 MW solar project under JNNSM Phase-II, Batch-I, India

Under JNNSM Phase-II, Batch-I, 750 MW of grid-connected solar PV power projects were set up with VGF funding from National Clean Energy Fund (NCEF) through SECI. Key features were:[26]

- Solar Power Developers (SPDs) developed the projects on BOO basis
- SECI purchased the power generated from the projects at a fixed levelized tariff of ~7.4 cents/kWh for 25 years and SECI sold to willing state utilities/distribution utilities/other bulk consumers, at a fixed tariff of ~ 7.5 cents/kWh for 25 years
- SECI selected the projects through a process of open competitive reverse bidding on VGF
- The bids were categorized in two ways: (i) 375 MW with stipulation of Domestic Content Requirement (DCR) in respect of solar PV cells and modules to be used for the projects and (ii) 375 MW with DCR restriction
- SECI set up a Payment Security Mechanism involving a corpus of ~USD 23.20 million to ensure timely payment to the developers
- The NCEF made available to MNRE ~USD 0.34 million/MW of the funds for provision of VGF support

Key Learnings:

This project provides the following key learnings:

- Solar technology was relatively new to the Indian context, and as such, the GoI determined to provide Viability Gap Funding (VGF) to support the investment. Also, to stimulate domestic manufacturing, use of 'local content' in overall project was scoped.
- SECI provided a strong institutional structure for the procurement
- The PPA concluded by the developer and SECI was bankable. Also, it was SECI's responsibility to procure the power from developer at a defined PPA rate and thereby sell it to distribution utilities across multiple states. Also, setting up of 'Payment Security Mechanism' served to increase investor confidence

[26] Government of India, MNRE notices

2. ICB IN NEPAL

2.1 OVERVIEW

Nepal conducted its first ICB in February 1998 when the Electricity Development Center[27] issued an RFP for a feasibility study of 17 HPPs based on a decision from the Ministry of Water Resources.[28] Since then, the GoN has employed numerous approaches to competitive bidding, conducted via multiple state entities, with varying levels of success. These experiences are summarized in the table below.

Table 15: ICB Experiences from Nepal since 1998

DATE	PROCURING ENTITY	PROJECT NAME(S)	BIDDING MODEL & PROCESS	EVALUATION CRITERIA	PROJECT DEVELOPMENT MODEL	WINNING BIDDER	LEARNING
1998	Department of Electricity Development (DoED)	17 HPPs	Single stage, single envelope	Technical and Financial Parameters	BOOT	12 HPPs awarded, 5 did not receive any bids	Lack of preparation before bidding
1999	DoED	(i) 11 HPPs for development (ii) 11 HPPs for feasibility study	Single stage, single envelope	Technical and Financial Parameters	BOOT	Info not available	Lack of preparation before bidding
2006	DoED	(i) Upper Karnali HPP (ii) Arun-3 HPP (iii) Budhi Gandaki HPP	Single stage, single envelope	(i) Free power & equity (ii) Free equity (iii) Free equity	BOOT	(i) GMR-ITD consortium (ii) SJVN India (iii) No substantive bids	Lack of market guarantee
2001/2007	DoED	Kabeli-A HPP	Two stages, Envelope system info not available	Tariff	BOOT	Kabeli Energy Limited (subsidiary of Butwal Power Company Limited)	Lack of preparation before bidding
2009	DoED	8 HPPs in two packages	Single stage, two envelopes	Upfront charges for license	BOOT	6 HPPs awarded as *'super 6'* projects	Lack of co-ordination among GoN agencies

[27] Now known as the Department of Energy Development - DoED
[28] now merged with the Ministry of Energy to create the Ministry of Energy, Water Resources, and Irrigation - MoEWRI

DATE	PROCURING ENTITY	PROJECT NAME(S)	BIDDING MODEL & PROCESS	EVALUATION CRITERIA	PROJECT DEVELOPMENT MODEL	WINNING BIDDER	LEARNING
2016	Nepal Electricity Authority (NEA)	Grid connected Solar PV Plants (22 locations, 64 MW)	Single stage, single envelope	Tariff	BOO	LOI issued to 9 developers (21 locations) in Oct 2016	Lack of consistent policies and message from GoN
2018	NEA	Solar power from utility scale grid tied projects (22 locations, 62 MW)	Single stage, two envelopes	Tariff until June 30, 2022 (NPR 6.6/KWh thereafter)	BOO	5 developers for 24 MW	Lack of preparation before bidding
2019/2021	Office of the Investment Board of Nepal (OIBN)	i) Tamor HPP ii) Lower Arun HPP	Two stages, need info on envelope system	Free power	BOOT	i) Consortium of Power China and HIDCL ii) SJVN India	i) Inconsistent policies ii)Not Applicable (recent award)

2.2 NEPAL'S REGULATORY AND INSTITUTIONAL ICB FRAMEWORK

As the discussion on global experiences with ICB illustrates, successful ICB practices rely, first and foremost, on a robust and regulatory framework. The discussion which follows identifies and describes the work of the principal administrative and commercial bodies currently managing procurements for Nepal's electricity sector – the Ministry of Energy, Water Resources and Irrigation (MoEWRI), the Nepal Electricity Authority (NEA), the Department of Electricity Development the (DOED), and the Office of the Investment Board of Nepal (OIBN).

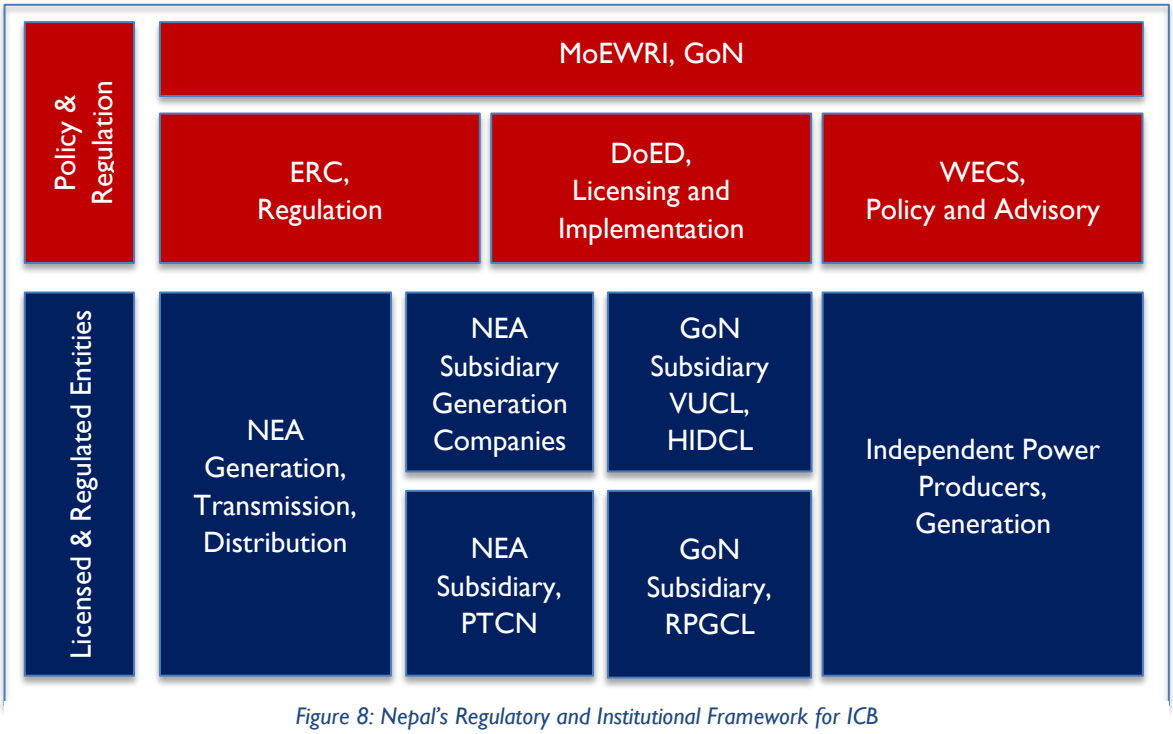

Figure 8: Nepal's Regulatory and Institutional Framework for ICB

MoEWRI: Among its many tasks, the MoEWRI develops, implements, and monitors policies and plans. For example, the Hydropower Development Policy (2002), issued by the MoEWRI, was the first policy document in the power sector which set a clear policy of developing HPPs on a competitive basis.

DoED: The Department of Electricity Development (previously the Electricity Development Center) acts as the implementation arm of the MoEWRI. It too was established for, among other purposes, to develop the energy sector through private sector participation. DoED is It is responsible to manage hydropower bidding processes for IPPs, issuing of survey licenses, and to provide guidance to the private sector. While the DoED's foundation documents do not make competitive bidding mandator, but DoED has been conducting competitive tenders on an ad-hoc basis owing to the fact that the Hydropower Development Policy states that "conducting competition in the course of issuing the license" is a principal function of DoED.[29]

NEA: The Nepal Electricity Authority (NEA) is a vertically integrated, government-owned utility, responsible for generation, transmission, and distribution of electricity. Under Nepal's single buyer model, it is the only domestic off-taker of power in the country. Under the single buyer model, independent power producers (IPPs) require a PPA from NEA to sell power to the grid. For the procurement of power from IPPs, NEA also has an ad-hoc framework for the conduct of tariff-based auctions for the purchase of electricity from solar projects. The 2016 Concept Paper on National Energy Crisis Prevention and Electricity Development Decade requires NEA to invite competitive bids to connect solar or wind electricity to the National Grid.[30] NEA had conducted two competitive bidding processes for solar projects in 2016 and 2018.

OIBN: OIBN was established under the Investment Board Act, 2011 as a high-level agency with a de facto role as the GoN's public-private partnership (PPP) unit for the implementation of HPPs exceeding 500 MW. OIBN's role has been substantially enlarged by the PPP and the Investment Act, 2019. Today its principal role includes facilitating FDI projects, negotiating PPP projects, and executing Project Development Agreements (PDA), for the implementation of hydropower projects above 200 MW. Investment approval is also required from OIBN for the hydropower projects having investment of more than 6 billion Nepalese rupees, and it is also mandated to manage the execution of project having capacity of the more than 200 MW. The PPP and the Investment Act is the law governing private financing of infrastructure projects in Nepal; as such, it includes detailed provisions for the conduct of competitive procurements, situations where direct procurement is permitted, and introduced the Swiss-Challenge approach for unsolicited proposals.

With the exception of OIBN, none of the above-identified GoN bodies conducting electricity sector procurements have fully defined approaches to competitive tendering. As a result, their *ad hoc* forays into competitive bidding have chronically been bogged down by unsystematic approaches and haphazard outcomes.

[29] GoN. (2002). Hydropower Development Policy. Para 6.15.1(2).
[30] NEA. (2016). Concept Paper on National Energy Crisis Prevention and Electricity Development Decade, 2016. Para 5.1(d).

2.3 LAWS AND POLICIES SUPPORTING ICB

The following policies, laws and regulations are the principal government announcements and legislative acts governing Nepal's electricity sector in Nepal. In the aggregate, they provide an inadequate focus to facilitate competition in the sector. While they seem to recognize the importance of competition, there is lack of substantive provisions to drive the integration of competition in the procurement process.

Table 16: List of acts, regulations, policies that provide for PPP Competitive Bidding

YEAR	ACT/POLICY/REGULATION	Provisions for Competitive Bidding
2001	Hydropower Development Policy; Public Infrastructure Build Operate and Transfer Policy	Provides a clear policy statement outlining the use of competitive framework for development of hydropower projects Sets out a strategy to award hydropower project with capacity of more than ten MW, on competitive basis through invitation of proposals.
2006/ 2007	Private Financing in Build and Operation of Infrastructure Act (BOOT Act) and related Regulations	Defines Infrastructure to include energy production and distribution. Main aim is to involve private sector in infrastructure development. Sets out provisions for invite competitive proposals for awarding Infrastructure projects to private sector.
2016	National Energy Crisis Prevention and Electricity Development Decade.	States that systematic method of competition will be adopted for development of hydro-electricity projects in government's basket.
2017/ 2018	Electricity Regulatory Commission Act and associated Regulations	Clear mandates are provided to Electricity Regulatory Commission (ERC) to enhance competition in the electricity market.
2019/ 2020	PPP and Investment Act 2019 and associated regulations	OIBN is authorized to conduct procurements for projects exceeding 200 MW following a competitive method. A clear process and framework are outlined in the rules for soliciting proposals for award of projects.
2020	Draft Electricity Bill	The draft Electricity Bill deviates from the existing two-stage licensing system. Under the draft Bill, Survey License is not made compulsory. The draft Bill makes award of project after following a competitive procedure. However, there are exceptions if the projects are to be developed by government-owned entities.

2.4 HISTORY OF ICB IN NEPAL

ICB is a prominently used and advantageous process by which to procure hydropower, and many other energy sources. The history HPP development in Nepal can be separated into two distinct phases – a public sector led pre-liberalization phase before 1992 and a post-liberalization phase that started with the promulgation of the Electricity Act in 1992. While the former was characterized by total public sector dominance, while the latter witnessed both international and domestic private sector participation and the beginning of competitive bidding in 1998. The first competitive bidding in the HPP space was conducted in 1998, whereas the first competitive bidding for solar projects occurred in 2016.

Since the development of Nepal's first hydropower plant in 1911, the public sector succeeded in adding only 239 MW**Error! Bookmark not defined.** of installed capacity through 1992. Although the GoN h ad identified larger projects, including Khimti (60MW) and Bhotekoshi (36 MW), to increase power generation, it needed increased funding, better technology, and skills to move them into development. Because the GoN had limited resources to contribute to the project, it decided instead to look to the private sector, both domestic and international, to lead HPP development.

This served as a catalyst for the introduction of a series of policies and legislation[31] that paved the way for private sector participation and foreign investment. PPP - based project development through the BOOT model was introduced, and incentives including tax holidays and customs duty exemptions were announced to make the energy sector conducive to private investment.[32]

Driven by these changes, the GoN awarded three HPPs, Khimti-I (60 MW), Upper Bhotekoshi (36 MW, later increased to 45 MW), and West Seti (750 MW), to the private sector from 1994 to 1996. The first two were designed for domestic consumption and soon signed Power Purchase Agreements (PPA) agreement with the NEA. On that basis they succeeded in arranging necessary funding and went on to successful implement a move away from public sector-led HPP development. However, the third HPP, West Seti, was unable to arrange necessary funding to take it to the next step.

Although these projects involved private sector participation and international funding, they were not awarded through ICB processes. Rather, they were directly awarded by GoN to the developers. Such a process may have been convenient and less time consuming, but it did not promote competition.

The GoN felt that only a select few countries and developers were aware of Nepal's policy shift in HPP development.[33] At the same time, there was a sense within the domestic private sector that the GoN should make the licensing process more competitive, so as to increase participation. In February of 1998, based on a decision of the Ministry of Water Resources,[34] the Electricity Development Center[35] issued an RFP for a feasibility study of possible 17 HPPs. The policy statement included in the Hydropower Development Policy (2001) laid strong emphasis on competitive framework for development of hydropower projects.

In 2016, the GoN issued an Action Plan entitled *National Energy Crisis Prevention and Electricity Development Decade* (Action Plan) which set a goal of generating 10,000 MW electricity in 10 years with alternate energy forming 5-10% of the generation mix. That plan included various provisions to connect solar or wind power to the national grid and invite competitive bids for PV solar and wind electricity projects. The plan also required the NEA to conduct these tenders, as it was responsible to provide required connections points to the solar projects. The policy paper set the benchmark per unit PPA rate for such projects at NPR 9.61 and required that the PPA be on a *take or pay* basis for 25 years.

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32 Winrock International and Oxford Policy Management. (2009). Nepal: Defining the political opportunities and constraints in key economic sectors for promoting including growth,

33 Some of the policies and legislations formulated were Electricity Act, 1992 Hydropower Development Policy, 2001, Water Resources Act, 1992 and Foreign Investment and Technology Transfer Act, 1992

34 Now merged with the Ministry of Energy to create the Ministry of Energy, Water Resources, and Irrigation - MoEWRI

35 Now known as the Department of Energy Development - DoED

To meet its obligations under the Action Plan, during the same year, NEA issued an RFP to selected developers for new grid connected solar Photo Voltaic (PV) power projects at 22 different locations across Nepal. The model selected for these tenders not only made the private sector responsible for building and operating the plant – the successful bidders were also required to assume the responsibility for land acquisition, rights of way, and government permits. The predominant bidding method used for these solar project procurements was tariff-based bidding. To date, GoN has signed PPA with approximately 56 MW (out of a total of 72 MW) of solar energy from that competitive bidding process.[36]

It has been almost three decades since Nepal started allowing private sector participation in generation projects. Since then, the GoN has released procurement documents for a total of 41 HPPs and 27 solar projects through competitive bidding. Because some of these projects were re-packaged and re-auctioned (some even renamed), it is very difficult to secure precise data regarding how many of these projects reached financial closure to properly assess Nepal's success at ICB. However, based on literature review and various stakeholder discussions, these numbers are expected to be 17 HPPs and 6 solar projects. Each procurement provides a case study of successes and opportunities for improvement.

2.5 CASE STUDIES OF ICB IN NEPAL

Revenue Share-Based Bidding (Free Energy and Free Equity) Case Study

In December 2006, DoED solicited Expressions of Interest (EOI) to develop the Upper Karnali, Arun-3, and Budhigandaki HPPs, all under the BOOT model and with a concession period of 30 years. Evaluation was based on free power provided to GoN and/or free equity provided to NEA under the revenue share-based bidding model. DoED selected this model and these evaluation criteria to ensure a market for those large projects, increase electrification, and secure technology transfers from experienced bidders.

For each of the bids, the DoED followed a single-stage bidding process. Points were assigned for several technical and financial criteria, including the bidder's date of incorporation, prior experience in the development of large infrastructure projects, financial soundness, existing power marketing arrangements, and the project completion period. The bidder with the highest number of points was awarded the project with a passing score of 60 out of a total of 100 points.

Upper Karnali

The Expression of Interest (EOI) for the Upper Karnali HPP (300 MW, later increased to 900 MW) was solicited with two main bidding parameters – free equity and free power.

The DoED received a total of 13 bids from companies based in India, China, and the Netherlands (full list in **Error! Reference source not found.**). The GMR-ITD consortium (GMR Energy Limited, India and Italian Thai Development Company Limited, Thailand) which offered 27% free equity to NEA and 12% free energy to Nepal, won the bid and signed an Memorandum of Understanding (MoU) with the GoN in January 2008.

[36] Based on data obtained from NEA's Power Trade Department as of August 31, 2021

The PDA was not concluded for eight years (2014), owing to land acquisition delays and the need for the contract to be approved by the Parliament committee. The project company has recently signed an LOI issued by the Bangladesh government to purchase 500 MW but is yet to arrange necessary funding and a market in India.

Arun-3

The Arun-3 HPP (402 MW, later increased to 900 MW) was solicited under a single parameter: free power. DoED received 9 bids from Indian and Chinese companies (full list in **Error! Reference source not found.**). SJVN India, a joint venture between Himanchal Pradesh state government and the government of India, won the bid with 21.9% free energy offer and signed a MoU with the GoN in March 2008.

Like Upper Karnali, Arun 3 suffered delays owing to land acquisition and bureaucratic delays. Six years after the survey license award, a PDA was signed between the GoN and SAPDC (SJVN Arun-3 Power Development Company) in 2014. The project achieved financial closure in 2020 (even without a PPA agreement) with a consortium of banks in Nepal and India.

Key Learnings:

- It is crucial to identify and arrange a market for larger projects. Both projects found it difficult to conclude PPAs in the regional market and in consequence, to arrange necessary funding
- The GoN needs better co-ordination among its institutions to speed up issues such as land acquisition, rights of way, and rehabilitation and resettlement
- The GoN needs to properly conduct feasibility studies and allocate risk to the private sector. The third projects in the list, Budhigandaki HPP, did not receive any substantive bids because the private sector was not certain about its viability

Upfront Charges-based Bidding Case Study

In August 2009, DoED published an RFP for the award of licenses for 8 HPPs (divided into two "*packages")* under the BOOT model. While doing so, GoN promised to build the necessary infrastructure (transmission lines) for power evacuation and PPA with state-owned NEA.

DoED adopted a single-stage / two envelope bidding process. While the projects in Package A were open to 100% Nepalese Firms or joint ventures, those in Package B were open to firms or joint ventures with Nepalese citizens as majority shareholders. Bidders were requested to provide a technical and a financial proposal in two envelopes with those achieving a passing score in the first stage technical screening progressing to the final stage of financial evaluation.

Technical parameters included a stated threshold of net worth and the ability of the bidders to provide a letter of commitment / intent from financing institutions. Those progressing to the second stage were evaluated based on obligations undertaken by the bidder related to the Survey License upfront charges. For projects in Package A HPPs, minimum upfront charges were set at Nepalese Rupees (NPR) 10 million, while for those in Package B, they varied between NPR 5 million for Khimti-2 and NPR 100 million for Solu.

Six of the eight projects were later designated as "super six" projects and awarded to private developers. While the Solu HPP and the Lower Solu HPP were awarded to consortiums of Nepalese and international developers, the other four were awarded to Nepalese developers (details in **Error! Reference source not found.**). Ten years after the award of Survey Licenses, these projects are still at various stages of construction.

Key Learnings:

- There was a chronic lack of co-ordination among GoN entities
  During the bidding stages, GoN undertook to provide proper evacuation facilities for the energy and to conclude PPAs in a timely manner. However, a lack of co-ordination among NEA and DoED slowed the PPA process and major evacuation transmission lines are still under construction. Although the developers had prepared Detailed Project Report (DPRs) within a few years of Survey License and had targeted Commercial Operation Dates (CODs) for 2014 and 2015, they could not achieve financial closure without a PPA.
- Another reason for delay was the GoN's policy shift from Q65 to Q40 project design
  The Q factor denotes the water flow rate (discharge) of the river i.e., Q65 means that the design discharge from the project should be available 65 percent of the time during a year. A change in the discharge rate also necessitates a change in the project capacity. Initial study had been conducted on a Q65 basis and hence some of the developers changed the project installed capacity, adding to the delays.

Tariff-Based Bidding Case Study

Nepal first employed tariff-based bidding practices in 2001, when an RFQ was published for the development of the Kabeli-A HPP in 2001. For that project, DoED adopted a two-stage bidding process pursuant to the World Bank (WB) procedure in which: an RFQ was published in 2001 to create a list of pre-qualified bidders and a subsequent RFP was published in 2006 to select one bidder from the developers which had been successful in the first round.

The project was awarded in 2007 based on the lowest tariff to Kabeli Energy Limited (a subsidiary of Butwal Power Company). The PDA was concluded in 2010 with the PPA following immediately afterward in 2011. The agreed PPA rate comprised of a blending of a USD and NPR component, with 47% denominated in USD for 15 years to match the USD component of project debt. The base tariff (without VAT) was set at 5.7660 cents/KWh (6.2985 cents/KWh with VAT) and the initial USD-NPR exchange rate was set at NPR 71.25.

To date, the Kabeli-A HPP is the only example of a tariff-based bidding for HPPs in Nepal. Although the project began construction in 2012, despite funding support from the International Finance Corporation (IFC) and the World Bank, it currently is facing extended delays owing to disputes with contractors. The future of the project remains uncertain, as the Tamor HPP (awarded to PCCC through competitive bidding in 2019) could potentially render if financially unfeasible.

Key Learnings:

- GoN and the developers may not have been ready to comply with the rigorous WB procedures, and terms and conditions. All the parties concerned, including GoN and the

developer, struggled to conduct the necessary studies and furnish required documents within the expected timeline

- The developers had estimated a healthy rate of return using WB concessional financing, however, there were miscommunications regarding the nature of concessional financing during the bidding process and as a result, extended negotiations were required
- GoN had failed to conduct sufficient studies prior to commencing the bidding process Some technical specifications, including the hydrology factor, added uncertainty to project costs and returns and required modification during the bidding and negotiation process.

2.6 BIDDING FOR SOLAR PROJECTS

Tariff-based Bidding for Solar Projects Case Study

The GoN has made two attempts to procure solar power through ICB – in 2016 and 2018. Under both instances, those bidders who passed the initial screening based on technical and financial criteria were finally judged based on the lowest tariff quoted.

In 2016, NEA received bids for 61 MW in 21 locations out of a total of 64 MW in 22 locations. One of the locations, Baneshwor, received no bids, as the developers perceived the risk of being unable to acquire land in such a densely populated area to be too great. Letters of Intent (LoI) were issued to 9 different developers in 2017 who quoted tariff rates ranging from NPR 8.45 to 9.61.

In 2018, NEA published an RFP for the supply of solar power from utility scale grid tied projects at 22 different locations (62 MW). The GoN had received financing from Asian Development Bank (ADB) for renewable energy expansion in the region and a portion (USD 18.5 million) of the grant was allocated as Value Gap Funding (VGF) to purchase solar power from eligible solar power developers. An international competitive bidding process was conducted to accommodate the grant component, pursuant to ADB's single-stage / two-envelope bidding procedure.

The NEA fixed the tariff rates at NPR 6.6 per unit from July 2022 and as such, evaluation was based on the lowest tariff quoted until June end of the same year. The difference between NPR 6.6 and the bids received were to be borne by ADB through the VGF. Although, the pre-bid conference was a huge success, with participation various developers from multiple countries, only 5 bids were received. Subsequently, NEA concluded PPAs with the 5 developers at NPR 16.6 each for 24 MW.

Neither bidding processes received the level of participation expected and many developers who did participate have been critical of tender process delays.

Key Learnings:

- GoN's PPA policy changed after the project awards
  The GoN had initially set the PPA rates at NPR 9.61 based on the 2016 *National Energy Crisis Prevention and Electricity Development Decade*. However, when the bids were received and LOIs were issued, NEA revised the PPA rates to NPR 7.3 Based on the change, NEA attempted to re-negotiate the PPA terms with the developers. However, only a few developers accepted the new rates and concluded the PPA. Furthermore, the establishment of the Electricity Regulatory Commission (ERC) during the same time and the resulting changes in procedures for PPA approvals added to the developer's frustrations, causing some of them to withdraw from the projects.
- In the 2018 auction conducted under ADB VGF, NEA received bids that were significantly higher than either they or ADB had expected

As the tender process had not set bid ceilings, prices quoted varied from NPR 17.80/KWh to NPR 49.00/KWh. Considering these rates to be significantly above the market rates, there were renegotiations until a consensus was reached to change the tariff to NPR 16.6/KWh

- Pursuant to the policy changes made for solar tariffs, some of the developers received very little time to react to the new PPA rates
  They had received a survey license for a period of 2 years — a period that expired before they could re-negotiate new PPA terms with the NEA. In addition, the policy of capping both the licensing and PPA to 25 years did not provide a cushion for the development period and made the effective concession period less than 25 years.
- Both bid processes required the developers to arrange their own land for solar installations, and this resulted in extensive delays, and although developers were given the option either of purchasing or leasing the land, it nevertheless resulted in a very drawn-out process
- Some technical issues also slowed the bidding process and as a result, slowed down project development
  The developers were uncertain on how solar energy would be integrated to the grid and lacked clarity on which substations would be used. In addition, NEA required the bidders to lock-in their respective energy tables at an 18% capacity factor, but it was not clear whether the capacity factor was on the Alternating Current (AC) or Direct Current (DC) side. NEA signed a different PPA at posted rates for excess energy to resolve them.

3. GAP ANALYSIS AND RECOMMENDATIONS

Nepal has made several efforts to incorporate ICB into its electricity procurement. Beginning with the Electricity Act (1992) and related implementing regulations and continuing through to the current Electricity Act Bill currently before Parliament, the GoN has acknowledged the importance of using competitive procurements for electricity sector projects. Some of the larger generation hydropower projects, including as Arun-3 and Upper Karnali, which were procured through ICB, are making steady progress. Within the renewable energy sector, generation projects sourced through competitive bidding are beginning to be connected to the grid.

Leading practices show that ICB is a consistently useful and effective tool over time, when supported by a strong institutional, legal, and regulatory framework to guide both the government owners of the process and the private sector developers. Clear rules, consistently applied, will send signals that will jump-start private sector participation and lead to steadily rising interest. Institutions operating within clear jurisdictional boundaries, with clear tasks to perform and clear reporting requirements will reduce ambiguity, increase predictability of results. This report details additional steps GoN can take to continue to support ICB and improve the established processes in future energy procurements.

3.1 IMPROVING COORDINATION AMONG GON ADMINISTRATIVE AND COMMERCIAL BODIES

One of the biggest challenges to successful competitive procurements is a lack of coordination among government bodies. This is a common problem in many countries, usually arising from unclear frameworks, and undefined roles and responsibilities. Where multiple bodies are involved in the same or similar activities, unintentional disputes of authority may occur, resulting in decisions from various agencies rather than a single source, resulting in uneven results.

The post-bidding circumstances of Super Six projects described in section 0 (Upfront charges-based bidding case study) in this report illustrates the point. In these cases, the procurements managed by DoED included commitments to provide for the evacuation of electricity and for PPAs to be concluded in a timely manner. This decision by DoED may not have considered all of the impacts as NEA holds the obligation for both of these undertaking. The entire process could not help but be delayed to the detriment of project developers when NEA was unable to timely perform on these obligations.

These gaps point to un-coordinated commitments by separate government parties, leading to improper risk allocation among the parties involved. It could also be attributed to a lack of competent oversight by the MoEWRI, which should ultimately be responsible to oversee all such important sector activities.

To remedy this, the GoN should map the roles and responsibilities for each government organization within the procurement process. Doing so will not only provide clarity internally, but will also send clear signals to the market, reducing development risk and overall cost to both developers and the government.

3.2 0APPOINT A PURPOSE-BUILT BID-PROCESS COORDINATOR

NEA, Nepal's state-owned, vertically integrated utility, exerts monopoly power over the three principal aspects of its business: the generation, transmission, and distribution of electricity. Under leading international practices, many utilities have been unbundled to avoid the conflicts of interest that naturally attach to the utility and its government owner.

An independent Bid Process Coordinator (BPC), without any conflict of interest, responsible for coordinating the bidding process could assist in making the bidding experience more transparent and streamlined. Such an agency could also monitor and supervise the bidding process and serve as a grievance redressal agency as well. Referring to international experience, we can see that ANEEL in Brazil, Ministry for Mines, Water, Energy and Environment in Morocco, Ministry of Energy and Mineral Resources of Jordan, and Danistay (Turkey's then acting Power Regulator) supervised and regulated bidding process for various generation projects.

Developing a separate agency for these tasks is a time-consuming process that should be supported by authorizing legislation that specifies the exact tasks of the new agency – especially as distinguished from existing government organizations. Alternatively, these tasks may be assigned to an existing government organization, if supported by authorizing policy, processes, and capacity within the organization.

3.3 SHARING RISK IN ASSESSING AND SELECTING PROJECT SITE

Land acquisition, both for generation and transmission projects, and related right of way issues, continue to be a challenge in Nepal. For the biddings conducted in the past, the GoN has expressed little commitment to take such risks – much to the dismay of private sector developers. Difficulty in acquiring land, resulting from land scarcity and consequent rise in real estate prices, and the multiple permits needed to acquire government lands have added to project time and cost overruns. In addition, the numerous licenses and permits required at various stages of project development often exposes the inefficiencies in co-ordination among government agencies and add a layer of hidden costs to the projects.

Additionally, since HPPs are very site specific, many studies are often required to properly understand inherent environmental and technical risks. Any geological surprise or change in water flow, for example, during the project development cycle can be detrimental to project viability (please refer to Kabeli-A HPP bidding in section **Error! Reference source not found.**). As such, proper feasibility studies prior to auctioning HPPs could limit risks for the developers and encourage better participation.

When selecting a site for a generation project, the leading practice is that the party selecting the site has the responsibility to conduct site studies, including Feasibility Studies. Thus, if GoN identifies a project side, it is GoN's responsibility to conduct a detailed Feasibility Study which provides sufficient information to developers to adequately assess the risks of a project and create a determination of the costs to develop the project (suitability of the land, proximity of interconnection, etc.).

Alternatively, if the location of a project is a lower priority, then GoN may allow the developer community to select the site, and therefore the developer would bear the risk and burden of assuring the site is viable. If the developer community is expected to undertake this cost, then GoN should create streamlined review and permitting processes to reduce this burden upon developers, thereby reducing risk, and ultimately, reducing cost to both the developer and GoN.

In the past, competitive bidding processes have been conducted to award feasibility study rights (survey license), and thereafter rights over sites to allow power generation after completion of feasibility studies. The procedure entails two stage licensing process which makes the award of projects lengthy and cumbersome. NEA, on the other hand, is more interested in procurement of power at competitive tariff. This has inevitably increased disharmony on the approaches and priorities between GoN and the sole off taker, NEA. Additionally, this approach has placed the burden of feasibility studies entirely

on the developer, even in instances where the developer did not select the site and has no assurances of a future project.

Adjusting the responsibility for site studies, including such as feasibility studies, based on the party that has requested the project, would improve risk allocation among parties, and thereby improve private sector engagement. For example, when a developer directly applies for a license, it can be expected to take the risk of reviewing the site, as compared to instances in which the government has initiated a project for inviting private investment.

3.4 CREATE STANDARDIZED LEGAL DOCUMENTS

Although larger projects are protected by the provisions of PDAs, there has been no practice of signing binding legal documents for smaller projects. This exposes both of the parties, the GoN and the developer, to legal risks. As an example, the winning bidders of the *Super Six* were left with very few legal remedies when NEA prevaricated on GoN's commitments of PPA and evacuation facilities. If commitments from both parties can be captured with clear remedy procedures, then the bidder may feel more comfortable with the risks they are taking.

Utilizing standardized legal documents, such as contracts and PPAs, in future procurements would reduce risk to all parties, alleviate many disputes. When developing standardized documents, it is also recommended that a process be put in place to establish a process for continually updating the documents, to account for recent and relevant market shifts. As the market improves, and risks are reduced, the legal contracts should naturally shift to account for these changes in risk.

3.5 CREATE A REGIONAL MARKET STRATEGY

Finding a market for the electricity produced from larger projects has been one of the major causes of delay in project implementation for Nepal. Projects which have been structured and marketed as '*export-oriented',* have found it very difficult to secure PPAs in the regional markets. One such project, West Seti HPP, is a case in point. The project was handed to the international private sector in 1996, almost 25 years ago. However, after various rounds of national and international discussions, developers have been unable to secure a market for their energy and as a result, were unable to arrange the funding to move it forward. Without a clear strategy and infrastructure to export energy to the regional market, it may be difficult to get enough interest, participation, and competition for larger HPPs in Nepal. At the outset, it is important to identify an off taker for the project, either locally or regionally, which would make the project financially viable.

3.6 CREATE STABLE TARIFF POLICIES

GoN's solar development efforts have been plagued by un-coordinated setting of PPA rates. In the 2016 *National Energy Crisis Prevention and Electricity Development Decade,* the GoN set the PPA rates at NPR 9.61. On that basis, the NEA initiated the bidding process for the grid-connected solar PV projects. When the bids were received and LOIs were issued, a subsequent government regime revised the PPA rates to NPR 7.3. Based on the change, NEA attempted to re-negotiate the PPA terms with the developers. However, only a few developers accepted the new rates and concluded the PPA. Furthermore, the establishment of the Electricity Regulatory Commission (ERC) during the same time and the resulting changes in procedures for PPA approvals added to the developer's frustrations, causing some of them to withdraw from the projects.

Pursuant to the policy changes made for solar tariffs, some of the developers received very little time to react to the new PPA rates. They had received a survey license for a period of 2 years — a period that expired before they could re-negotiate new PPA terms with the NEA. In addition, the policy of

capping both the license and the PPA to 25 years did not provide a cushion for the development period and made the effective concession period less than 25 years. Creating a process for review and updating tariffs would provide increased transparency and stability to the market and improve outcomes for future procurements.

3.7 CREATE STANDARD BIDDING/PROCUREMENT DOCUMENTS

To date, competitive biddings for generation projects have been conducted on an ad-hoc basis in Nepal and there has been a lack of standard documentation and guidelines to make the entire bidding process more homogenous and process driven. Standard bidding documents and guidelines that capture the roles, responsibilities, and liabilities of all the stakeholders involved would improve the bidding process by providing clarity for both bidders and GoN. Consistent templates with required modifications to suit special needs of specific procurements can make the process more efficient. Since DoED, NEA, and OIBN, have all been involved in generation project procurement, a consistent set of documentation and guidelines can make the biddings more homogenous. A standard set of documents also lowers the risks for all parties, thereby lowering costs.

3.8 E-BIDDINGS

All the competitive bidding efforts so far have been paper-based, which leaves room for manual errors and decrease in productivity. E-bidding systems, on the contrary, can reduce costs, promote transparency, increase productivity, eliminate paperwork, improve accountability, and reduce errors. Such systems can promote participation and competition through fair and transparent competitive bidding.

4. RECOMMENDED ACTION PLAN

Based on the findings set out in the foregoing sections, the high-priority items listed below, if implemented, should yield significant improvements to Nepal's competitive bidding process, and increase FDI. Each action plan described below will require a coordinated effort among GoN agencies. It is recommended to identify an internal GoN lead for each action plan, to facilitate this coordination among agencies, lead the internal stakeholder groups, and help appoint leaders of each task. Finally, aligning the mandates of each administrative or commercial body holding procurement responsibilities will be an important step towards the success of each action plan.

4.1 ACTION PLAN TO IMPROVE COORDINATION AMONG GON AGENCIES

Any confusion in the marketplace will be perceived as risk not only to the specific project, but also to the market as a whole, resulting in increased costs to the developer, which are passed on to GoN. For these reasons, a cohesive message from GoN regarding proposed projects, the role of GoN agencies, and the expected outcomes will enhance private sector participation and reduce risk.

To create a cohesive project concept and procurement plan, it is recommended to create a roles and responsibilities matrix among GoN agencies, to create a structure for communication amongst the government stakeholders and facilitate whole-of-government decision-making.

Table 17: Roles and Responsibility Matrix

<table>
<tr><th colspan="3">Template for Procurement Roles and Responsibilities Matrix</th></tr>
<tr><td>GoN Agencies Involved:
DoED
NEA
OIBN</td><td>Time to completion:
6-9 months</td><td>Barriers:
- Many licensing approvals are not time bound
- Distinct procuring agencies for different types of projects; Identifying agency to lead the process
- NEA's role as a project developer and transmission/distribution service provider</td></tr>
<tr><td colspan="3">High-level Steps:
1. Create list of all GoN agencies involved in power project procurement; Create internal government stakeholder group
2. Create list of action items of each agency, and timeline of decisions
Create flowchart of procurement process, identifying the responsible agency at each point. Decision points would include if a particular project were appropriate for private sector participation.
3. Publish process to provide insight to developers of procurement process, and responsible parties</td></tr>
<tr><td colspan="3">Expected Impact: Reduce risk among developers, thereby increasing private sector participation, and reducing overall costs</td></tr>
</table>

4.2 ACTION PLAN TO CREATE STANDARDIZED LEGAL DOCUMENTS

Standardized legal documents – contracts and other legally binding acts, including Project Development Agreements (PDAs) and Power Purchase Agreements (PPAs) – provide the community of project proponents and developers with consistency predictability of results, thereby speeding up the overall process, reducing risks and lowering costs. Standardization of documents will yield improved procurement responses, reduced negotiation times, and lower costs for all stakeholders – the GoN, the developers and for consumers.

It is important to ensure that the standardized contracts are updated periodically to reflect the current market position, and to include them as needed in the de-risking provisions in the PPA and to address the current market risks.

Table 18: Standard Legal Documents

Template for Standard Legal Documents		
GoN Agencies Involved: **MoEWRI** **DoED** **NEA/ERC** **OIBN**	**Time to completion:** **6-12 months**	**Barriers:** - Different agencies within GoN may have different desired goals within the legal documents
High-level Steps: 1. Create internal government stakeholder group 2. Create external industry stakeholder group, including developers and financiers, to provide input on standard contract terms 3. Via legal advisor, create draft legal documents – PDA and PPA 4. Host stakeholder feedback sessions to test bankability of draft documents 5. Finalize documents based on stakeholder (internal and external) feedback **6.** Create timeline and process of regular review and updates of documents		
Expected Impact: Improved procurement process and reduced negotiations		

4.3 ACTION PLAN TO CREATE TEMPLATE PROCUREMENT DOCUMENTS

Procurement documents, including Requests for Qualifications, Expressions of Interest, Requests for Proposals, are each unique to the project and item to be procured. However, leading documents generally include similar categories of information, which can be tailored to the exact project or item to be procured. Templated procurement documents provide consistency and stability to the market responding to the procurement; they also shorten and streamline timelines for the government host of a procurement. In the case of Nepal, template procurement documents can be created to be updated and individualized at each procurement, to streamline the process and provide consistency along multiple procurements.

Table 19: Procurement Documents

Create Template Procurement Documents		
GoN Agencies Involved: MoEWRI DoED NEA/ERC OIBN	**Time to completion:** 6-9 months	**Barriers:** - Different procuring agencies for different types of projects; Identifying agency to lead the process
High-level Steps: 1. Create internal government stakeholder group 2. Create draft template procurement documents 3. Finalize documents based on stakeholder feedback 4. Create timeline and process of regular review and updates of documents		

4.4 ACTION PLAN TO IMPROVE RISK ALLOCATION

There is a significant risk that arises during the initial stages of project planning – namely, in the site selection and review of sites, developers can incur significant costs to review sites which may prove not to be feasible for project development. Leading practices often provide that the party who selects the site – the government or the developer – bears the responsibility for review of the site and the inherent risk. This general rule is applicable to procurements which are initiated by the government, as well as applications by developers for open sites, such as license applications. Thus, each scenario is distinct in how responsibilities and risk should be allocated. Proper risk-sharing between the government and developers – especially through the site selection process – will improve private sector participation and also reduce costs for all parties.

Table 20: Improving Risk Allocation

Improve Risk Allocation		
GoN Agencies Involved: MoEWRI DoED OIBN	**Time to completion:** 6-12 months	Barriers: - Limited resources available for GoN to conduct detailed feasibility studies - Hesitation on part of GoN to assume project related risks
High-level Steps: 1. Create internal government stakeholder group 2. Create external industry stakeholder group, including developers and financiers, to provide input on standard contract terms and risk allocation of tasks 3. Examine the risks related to land availability (either governmental land or private land) and transmission line network of evacuation of power 4. Create draft workflow and process, related to site selection and responsibility for site review. 5. Host external stakeholder feedback sessions 6. Finalize workflow and responsibilities based on stakeholder (internal and external) feedback		

About USAID's Urja Nepal Project:

USAID's Urja Nepal Project supports the efforts of the Government of Nepal in establishing effective policy, regulatory and operational changes to create a financially viable electricity sector, thereby enabling it to provide affordable, reliable, and secure electricity while encouraging private sector investment into Nepalese energy market. The Urja Nepal Project is supported by the American people through the United States Agency for International Development (USAID) and is implemented by Deloitte Consulting LLP.

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