



**SAARC
ENERGY
CENTRE**

Energy for Peace & Prosperity

**Online training of SAARC Professionals on Power Purchase
Agreements of Renewable Energy Projects
(Nov 08 – 12, 2021)**



**Roles and obligations of parties in Power
Purchase Agreements of Renewable Energy
Projects and dispute settlement
mechanisms**

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Dr. Ram Prasad Dhital

Member, Regulatory and External Affairs
Electricity Regulatory Commission, Nepal

ram.dhital@erc.gov.np

Topics

- Electricity Sector Overview
- Institutions in Electricity Sector in Nepal
- Role of Parties in Power Purchase Agreements of Renewable Energy Projects (RPPAs)
- PPA Process
- Generation Tariff and Key Provisions in Power Purchase Agreements
- Present Electricity Industries
- Key Challenges and Regulatory Regime
- Dispute Resolution
- Conclusion and Way Forward



White Paper, 2075 (2018AD): Electricity Sector Overview

- Vision of Government of Nepal (GoN) to have Installed capacity as :
 - 3 years : 3,000 MW by 2021
 - 5 years : 5,000 MW by 2023
 - 10 years : 15,000 MW by 2028
- Generation Mix Proposed by GoN as provisioned in Program No. 84 of White Paper, 2075 - **Out of 15,000 MW:**
 - Run of River (ROR) : 30-35% => 4500 - 5250 MW
 - Peaking Run of River (PROR) : 25-30% => 3750 - 4500 MW
 - Storage and Pumped : 30-35% => 4500 - 5250 MW
 - Alternative Sources : 5-10% => 750 - 1500 MW

Status so far

- Installed Capacity- 2 GW (Peak-1.4GW), 96% hydro and 1.5 % Solar
- Survey licenses- 17 GW (0.5 GW Solar),
- Under construction/PPA complete-8.4 GW (80 MW Solar)
- Electricity Access- 90% from grid, 3% from off grid= 93%

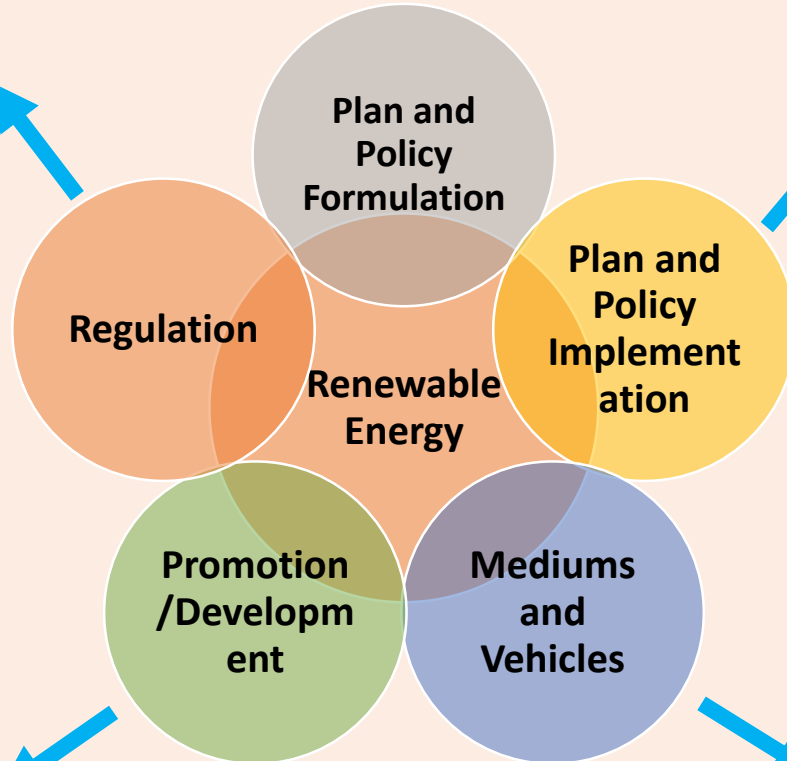
Electrical Energy Available in 2020-
8878GWh
NEA- 31.7%, Import-31.8% and IPPs-36.5%

INSTITUTIONS IN ELECTRICITY SECTOR IN NEPAL

Government of Nepal/Council of Ministers
 National Planning Commission
 Water and Energy Commission Secretariat
 Ministry of Energy, Water Resources and Irrigation

Electricity Regulatory Commission (ERC)

Ministry of Energy, Water Resources and Irrigation
 Ministry of Forestry and Environment
 Department of Electricity Development



Water Energy Commission Secretariat
 Investment Board of Nepal
 Provincial and Local Governments
 Nepal Electricity Authority (NEA)
 Alternative Energy Promotion Centre
 Independent Power Producers (IPP)

Generators (NEA and IPPs)
 Cross-Border Transmission (ongoing)
 Transmission Utilities
 Distribution Utilities

INSTITUTIONS IN PPA

Policy Formulation and Implementation

- Nepal Government and the Council of Ministers
- National Planning Commission
- Water and Energy Commission Secretariat
- Ministry of Energy, Water Resources and Irrigation
- Department of Electricity Development
- Investment board of Nepal

• Regulation

- Electricity Regulatory Commission (ERC)



• Off Taker

- Nepal Electricity Authority (NEA), the Vertically integrated utility in Nepal
- Involved in generation, transmission, distribution and trade of electricity in Nepal



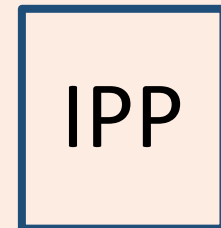
• Transmission Utility

- NEA
- Newly formed transmission company and NEA subsidiary – Rastriya Prasaran Grid Co. Ltd. (RPGCL)



• Project Development

- Independent Power Producers (IPPs)
- IPPs are represented through an umbrella organization called Independent Power Producers' Association - Nepal (IPPAN)
- NEA Subsidiaries
- Nepal Government (Company and Committee Model)



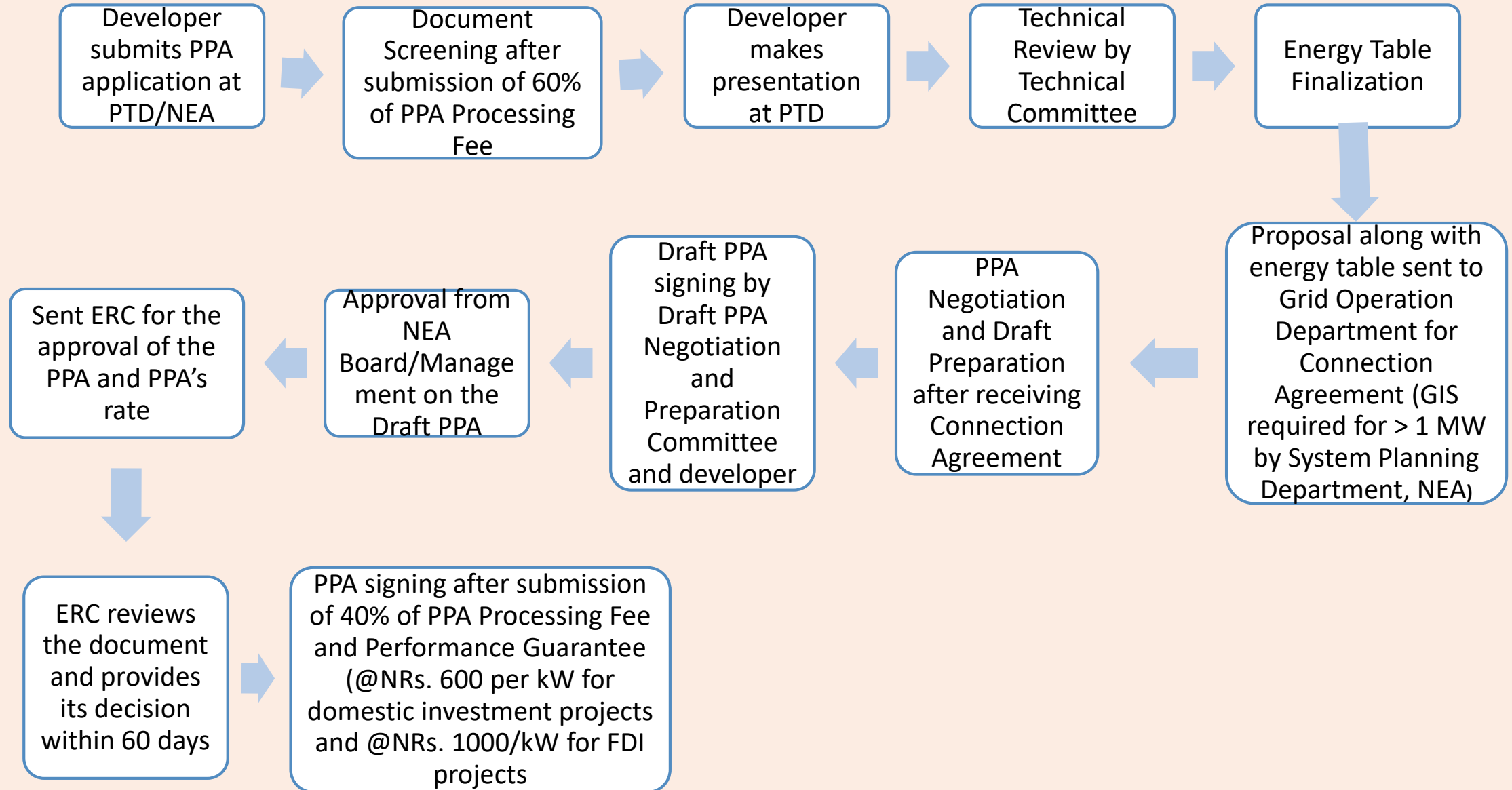
Role of Parties in Power Purchase Agreements of Renewable Energy Projects (RPPAs)

- NEA procures power by signing PPA directly with IPPs
- Nepal Electricity Authority (NEA) has a standardized Power Purchase Agreement (PPA) template for all kinds of PPAs. This is being reviewed by ERC. ERC will issue a new standardized template for all categories of projects
- There is no exclusive provisions for small hydropower projects in comparison to other hydropower projects. However, hydropower projects below 10 MW capacity have some relaxation clauses like removal of hydrological penalty, provision of weekly declaration etc .
- NEA uses the following 7 standard templates for PPA
 - PPA for Bagasse
 - PPA for Foreign Currency denominated project
 - PPA for PROR Projects
 - PPA for ROR Projects below 1 MW
 - PPA for ROR Projects above 1 MW
 - PPA for Solar Projects
 - PPA for Storage Projects
- Therefore, the obligations under Renewable PPAs with NEA are standard or fixed.
- No distinct concessions and considerations in terms of “renewability” of energy.

Power Purchase Agreements (PPA) (CONTD.)

- In case of cross border power trading, NEA either transacts power directly with State distribution companies of Bihar, UP and Uttarakhand under Indo-Nepal PEC mechanism or through PPA with government-appointed nodal power trading agency NTPC Vidyut Vyapar Nigam (NVVN), India and Power Trading Company India Limited (PTC).
- PPAs signed with Indian trading companies are of various terms:
 - Long term (with PTC through DM Line for 25 years)
 - Short term (with PTC through TM Line for less than a year)
 - Medium term (with NVVN through DM Line for more than 2 year)
- Recently NEA has signed Agreement with NVVN to trade power through Indian Power Exchange markets (IEX and PXIL) after this was allowed by Cross Border Power Trade Guidelines issued on 18 December 2018.
- NEA has been importing/exporting power from Indian Exchange Market since 1st May 2021

Power Purchase Agreements (PPA) Process



Documents for PPA Process

List of Documents to be submitted along with an application of Power Purchase Agreement:

1. Valid survey license
2. Company registration certificate
3. PAN certificate
4. Company's article of association (Prabandha Patra)
5. Company's article of memorandum (Niyamawali)
6. Letter of intent from financial institution or bank
7. Detailed feasibility study report of the project including IEE or EIA report

Additional documents for ERC

1. Tax clearance certificate and audit reports of last three years
2. Details of project developers
3. Grid connection agreement

Fee for PPA Processing

NEA Fee

- Up to 1 MW : NPR 75,000
- Above 1 -5 MW: NPR 1,50,000
- Above 5 -10 MW: NPR 3,00,000
- Above 10 -25 MW: NPR 4,50,000
- Above 25 MW :NPR 6,00,000

ERC fee

- Up to 1 MW:NPR 100,000
- Above 1 -10000 MW :
NPR 10,000/MW
- Above 10000 MW :
NPR 12,00,000

Generation Tariff

Tariff of ROR projects

NPR 7.30 per
Kwh for
Electricity
From
**Alternate
Source**

S.N.	Option	Season	Rate Rs/KWh (up to 100 MW)	Escalation (Rate, times)	Min. Dry season Energy required
1	Dry and wet season (6 months each)	Wet (June-Nov)	4.80	3%, 8	30 %
		Dry (Dec-May)	8.40		
2	Dry and wet season (4 and 8 months respectively)	Wet (May-Dec)	4.80		
		Dry (Jan-April)	8.40		15 %

Generation Tariff

Tariff of PROR projects

Season	Time of Day	Daily hours required to generate at rated capacity	Rate Rs./KWh
Dry (Dec-May)	Peak hours (5-11 PM)	1 hr to less than 2 hrs	8.50
		2 hrs to less than 3 hrs	8.80
		3 hrs to less than 4 hrs	9.40
		4 hrs to 6 hrs	10.55
	Non-peak hours	8.40	
Wet (June-Nov)	All hours		4.80

Tariff of Storage projects

Season	Rate Rs/KWh	Remarks
Dry (Dec-May)	12.40	minimum dry energy = 35%
Wet (June-Nov)	7.10 (If wet season energy is more than 50%, this rate shall be decreased by the excess %)	

Key Provisions: Tests and Investigation

- NEA shall nominate its employees to attend to witness the factory test of major electromechanical equipment in powerhouse. All associated costs to be borne by the Project.
- NEA shall have right to travel and investigate the project during construction, generation or operation of power plant with prior notice to developer without obstructing the day-to-day activities and security of the project/plant.



Key Provisions

Coordination Committee

- Each project shall have its own coordination committee with 2 members from NEA and 2 members from the developers.
- The meeting is responsible for resolving issues pertaining to testing of project, testing of Current Transformers, Potential Transformers, tasks related to calibration, improvement of operating procedures, coordination during maintenance, fixing required commercial date of operation, emergency maintenance, force majeure events, evaluation of project progress, etc.

Meter Reading

- There shall be two meters: main and check meter of same specification installed at connection point (off-take point) of each plant. The developer is liable to install such meter while the specification shall be provided by the NEA.
- NEA engineer shall test the meters and necessary CTs and PTs prior to installation, in a national or international lab as agreed by both parties.
- The meter reading shall take place at 12'O Clock of the first day of the month in presence of the both parties.

Key Provisions: Billing, Payment And Penalty

- NEA required to pay the bills issued by the developer within 45 days of submission of bill.
- If NEA purchases any excess energy through dispatch instruction, the developer shall be compensated at a rate which is 50% of the prevailing rate.
- In case of small hydropower and Bagasse power plant, there is provision of at most 8 simple escalation at 3% rate.
- No escalation for solar project.
- Provision of availability declaration for hydro, bagasse and solar; but recently, ERC ruled that no penalty can be imposed because of error in availability declaration for hydropower projects up to size 10 MW if the generation of the power plant has reduced on account of the concerned river's hydrology. Instead, a minimum deviation charge has been imposed to motivate power producers to accurately declare their availability.

Key Provisions

Operating Procedures

- The developer shall have to submit a draft of operating procedures 60 days before the required commercial date of operation.
- The operating procedure of the project shall be finalized by the coordination committee of the project by remaining under the limits of the power purchase agreement.

Off-grid And Black Start Mode

The PPA templates impose the following conditions for different projects:

- Small Hydro: Black Start Capacity and Off grid Mode Operation Capacity
- Solar: Off grid mode operation capacity
- Bagasse: No such conditions required

Key Provisions: Construction And Testing

- The responsibility of construction, testing and commissioning of project shall be Developer's responsibility.
- The testing and commissioning works of a project should be concluded such that it doesn't adversely impact NEA's generation, transmission and distribution activities.
- The developer shall be liable for any shut-down charges for shutting down of NEA lines/plants that may incur during construction or installation of the project's equipment.
- Following tests shall be conducted at the presence of NEA representatives:

For Hydro: Load Throw Test, black Start and Off Grid Mode Operation Test, etc.

For Solar: Load Throw Test, Anti-islanding, DC Current Injection, Harmonics, Power Factor, Voltage Unbalance, Flicker and Off Grid Mode Operation Test, etc.

For Bagasse: Not Specified

Key Provisions

Penalty for Non- Completion in time

- If the project fails to commission before the Required Commercial Date of Operation or if NEA fails to construct transmission facilities before the Required Commercial Date of Operation, penalty calculated as follows will have to be paid to the party at fault, to the other party:
- Penalty Amount= $0.05 \times$ amount of energy based on contract energy to be generated between required commercial date of operation to the commercial date of operation \times electricity rate at the time of Commercial operation date

Other Provisions

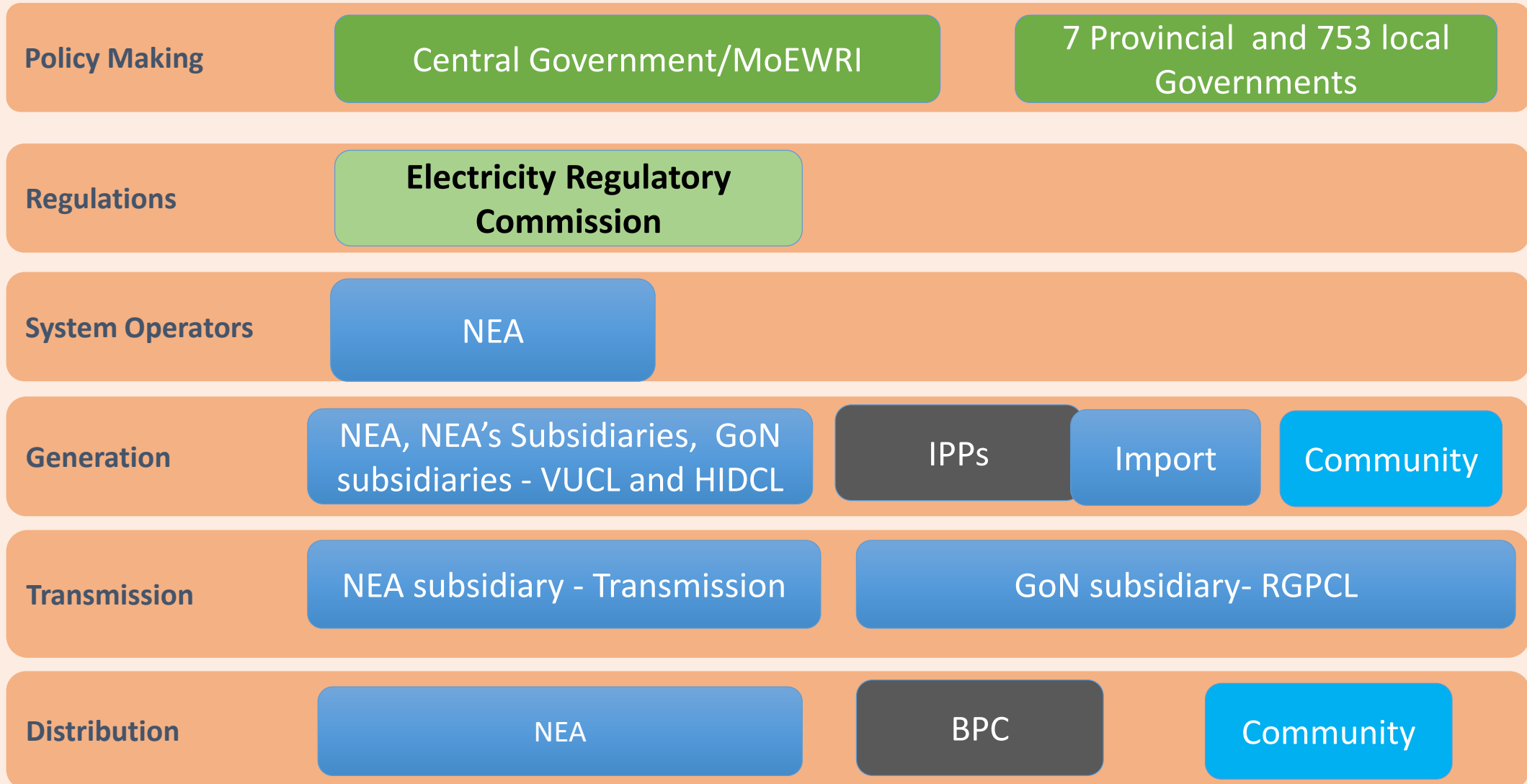
- Annual report to be submitted yearly.
- Submission of progress report of project in a prescribed basis.
- The project should commence construction within 24 months of PPA.

Dispute Resolution and Mediation

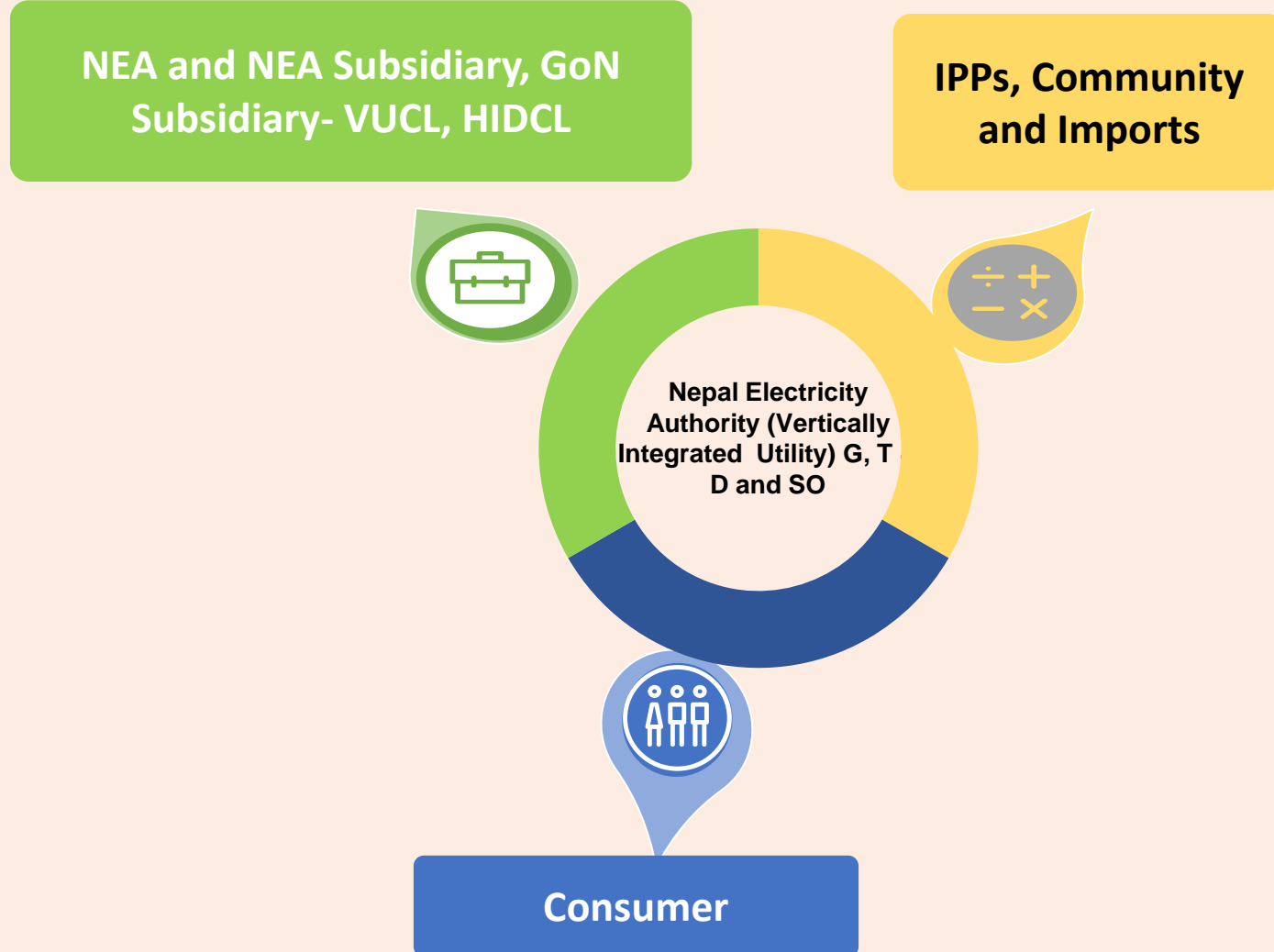
Provision prior to establishment of ERC:

- Upon emergence of any issue, the issue will first be addressed through a coordination committee meeting of the project.
- If that fails, two parties in dispute relating to matters of PPA shall enter a phase wherein two parties appoint two representatives for resolving the issue in just and consensual manner.
- If the parties fail to resolve the dispute in such a manner in 30 days, the representatives shall provide their opinion on the given matters to the Chief Executives of the firms in dispute. The Chief Executives shall have to reach an agreement within 45 days of receipt of such opinion from their representatives. Within 60 days of failure to do settle the dispute in the proceeding manner, or within a time frame agreed upon by both parties, one of the parties may notify the other parties and file for arbitration.
- The arbitration shall take place as specified in the prevailing laws of Nepal. Each party shall appoint one arbitrator who in turn shall appoint the third arbitrator, thereby leading to the formation of arbitration committee. Each party shall bear the expenses of the arbitrator appointed by them and shall equally bear the expense of the third arbitrator.

Present Electricity Industry Structure



Key Regulatory Challenges



- How to develop a competitive electricity market out of an existing NEA's monopolistic nature?
- How to establish a pricing mechanism that will provide incentive to investors as well as protect consumers' interest?
- How to ensure a level playing field to all operators ensuring access to transmission and distribution facilities?
- How to ensure quality, reliability and security of supply?
- How to monitor service quality and ensure that consumers get value for their money?

Electricity Regulation Regime in Nepal

ERC has been in operation since May 08, 2019 to regulate the generation, transmission, distribution and trade of electricity.

ERC Approach:

- **Light handed**
- **Consultative and**
- **Responsive**

Promote competition and protect the interests of consumers

Economic regulation (Generation Tariff – PPA, Transmission Tariff, Distribution Tariff and Trading Margin)

Technical regulation (Service standards and codes) including framework least cost expansion planning

Regulate compliance of service providers and licensees

Improve the corporate governance of licensees

Resolve disputes among licensees, consumers and service providers

Guiding Principles for Fixation of Generation Tariff

- Two-part tariff system – Capacity Charge incorporating loan investment made in the project and Energy Charge incorporating equity, returns, tax, royalty, operation and maintenance cost.
 - Full Capacity Charge where 100% availability is achieved as per the standards prescribed by the ERC and enjoy less Capacity Charge accordingly in proportion to the degree of availability achieved in case of achievement of less availability.
 - Capacity Charge shall not be fixed in the case of a project which has not borrowed loans or has already repaid the loans.
 - Other factors to be considered- loan interest, depreciation or accumulated depreciation, investment returns, general expenses, operation cost, maintenance cost, revenue, tax, additional capitalization, loan and equity ratio.
- Availability Based Capacity Charge to make the electricity producers responsible by maintaining such a condition in which they are able to produce electricity at their rated capacity.

Dispute Resolution and Mediation

Provisions after establishment of ERC:

- Upon emergence of any issue, the issue will first be addressed through a coordination committee meeting of the project.
- If that fails, two parties in dispute relating to matters of PPA shall enter a phase wherein two parties appoint two representatives for resolving the issue in just and consensual manner.
- If the parties fail to resolve the dispute in such a manner in 30 days, the representatives shall provide their opinion on the given matters to the Chief Executives of the firms in dispute. The Chief Executives shall have to reach an agreement within 45 days of receipt of such opinion from their representatives. Within 60 days of failure to do settle the dispute in the proceeding manner, or within a time frame agreed upon by both parties, one of the parties may notify the other parties and file an application to the Electricity Regulatory Commission for dispute resolution.
- Any issue not resolved in a manner described above shall be resolved by the Electricity Regulatory Commission.
- ERC shall resolve disputes based on internationally accepted practice of dispute resolution

Concluding Remarks

- Because Nepal's electricity sector is dominated by small hydropower project, no special schemes have been laid out for promotion of non hydro renewable except FIT for solar
- There's a general understanding in the Nepali masses and decision maker that, all energy in Nepal is renewable energy.
- Because NEA is a nationally owned monopoly, NEA has upper hand in terms of PPA negotiations with small and renewable projects by small time developers.
- ERC to develop a regulatory framework for power procurement plan so that ad-hoc basis of issuing license and PPA is stopped
- ERC to develop a regulatory framework for least cost expansion based on supply and demand to achieve competitive price of electricity
- ERC to establish base line and develop cost-reflective cum incentive-based tariff for generation
- ERC to establish a level playing field for electricity generators

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Thank you

