

Business Development Plan for the Power Trading Company of Nepal

Final Report

February 2020

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Abbreviations

AGM	Annual General Meeting
AMC	Annual Maintenance Contract
AS	Ancillary Services
BI	Business Intelligence
BoD	Board of Director
BU	Billion Units
CAGR	Compound Annual Growth Rate
CEA	Central Electricity Authority
CEO	Chief Executive Officer
CERC	Central Electricity Regulatory Commission
CGS	Central Generating Stations
CMD	Chairman and Managing Director
DISCOM	Distribution Company
EPS	Electric Power Survey
ERC	Electricity Regulatory Commission
FI	Financial Institution
FII	Foreign Institutional Investor
GoN	Government of Nepal
GW	Giga Watt
GWh	Giga Watt hour
IEX	Indian Energy Exchange
IMD	India Meteorological Department
IPP	Independent Power Producer
IT	Information Technology
ITSA	Implementation and Trading Service Agreement
kWh	Kilo watt hour
LC	Letter of Credit
LT	Long Term
MD	Managing Director
MIS	Management information system
MOEF	Ministry of Environment and Forests
MoEWRI	Ministry of Energy, Water Resources and Irrigation
MoP	Ministry of Power
MT	Medium Term
MU	Million Units
NPR	Nepali Rupee
NPTC	Nepal Power Trading Company
PAT	Profit After Tax
PBIT	Profit Before Interest and Tax
PDA	Project Development Agreements

PF	Provident Fund
PPA	Power purchase agreement
PXIL	Power Exchange India Limited
RE	Renewable Energy
RPO	Renewable Purchase Obligation
SAARC	South Asian Association for Regional Cooperation
SCADA	Supervisory control and data acquisition
ST	Short Term
ST	Short Term
Y-o-Y	Year on Year

1. Introduction

1.1. Background

Nepal has about 43,000 MW of techno-economically feasible exploitable hydropower potential while country's installed hydropower generation capacity is about 1,300 MW. Since most of the hydropower plants are of run-of-river type, the available generating capacity is low during dry (winter) seasons when the system demand is more than 1,300 MW.

At present 135 power plants with total installed capacity of about 2,604 MW are in different stages of construction. Out of them, 115 projects (2,805 MW) are under construction from private sector. As power from these projects will be added to the system in near future, the demand supply gap is expected to be reduced during the winter. There may be surplus electricity during the next wet season. Nepal signed a Power Trade Agreement (PTA) with India in 2014 and subsequently the Project Development Agreements (PDAs) were signed for two major hydropower projects (Upper Karnali and Arun III). The agreement encourages trading of electricity, investment in the region, including developing transmission interconnections, trading through the public and private enterprises, etc. Currently, Nepal is importing power from India through Dhalkebar- Muzaffarpur transmission line in addition to several other links at 33 kV and 132 kV to meet the power demand situation in the country.

Against the above background, the Government of Nepal developed a National Energy Action Plan in February 2016 that proposes several important reforms in the electricity sector including:

- A new electricity law and regulatory (ERC) law
- Operationalisation of the electricity transmission company
- Creation and operationalisation of a power trading company
- Establishment and operationalisation of an independent regulator (ERC)

The Action Plan listed measures to eliminate current power shortages and avoid the re-emergence of power shortages in future, and to ensure that Nepal's hydropower resources are developed for the export market in order to benefit Nepal's national economy. Following this, Nepal Power Trading Company (NPTC) was established on May 11, 2017. It is a subsidiary of Nepal Electricity Authority (NEA) which is the major shareholder (51% of total share) and rest of shares are owned by the National Generation Company, Rastriya Prasharan Grid Company Limited and Hydropower Investment and Development Company Limited. The Company has formed its board and is chaired by NEA's managing Director. However, the trading company is still to become fully operational and lacks an organization structure and business plan for its operation.

Deloitte was appointed by the World Bank Group to prepare the business plan and transition strategy for NPTC

1.2. Key objectives and scope of the study

The main objective of the study is to prepare a business plan for NPTC which includes the transition strategy from current set up in NEA



1.3. Structure of the report

The structure of the report is highlighted as follows.

Chapter 2 deals with the power market analysis including demand-supply overview and drivers for power trading in Nepal. The section also presents an overview of power supply situation in India, overview of short-term power markets in India and scope for trading of Nepal hydro power in India.

Chapter 3 provides a detailed overview of the existing Legal Framework for power trading in Nepal and provides a business model for the Power Trading company given the present legal and regulatory framework existing in the Nepal power sector.

Chapter 4 details out the various business models for NPTC in the future through changes / amendments in the Electricity Act / Regulations. This section also details out the implementation mechanism for each of the business models, the transition roadmap for operationalizing NPTC and key roles and responsibilities of each of the stakeholders involved from transitioning to a service provider for NEA to a full fledged power trading company.

Chapter 5 details out the Business plan for NPTC and highlights the Vision, Mission and Strategic Objectives, Organizational structure and institutional setup, Capacity Building initiatives required. The section also details out the Financing Plan along-with cost and revenue projections for base case scenario as well as results of sensitivity analysis based on various scenario assumptions.

Chapter 6 presents a section on detailed risk assessment. An overview of the different kinds of risks that may arise have been discussed, along with the risk mitigation plan.

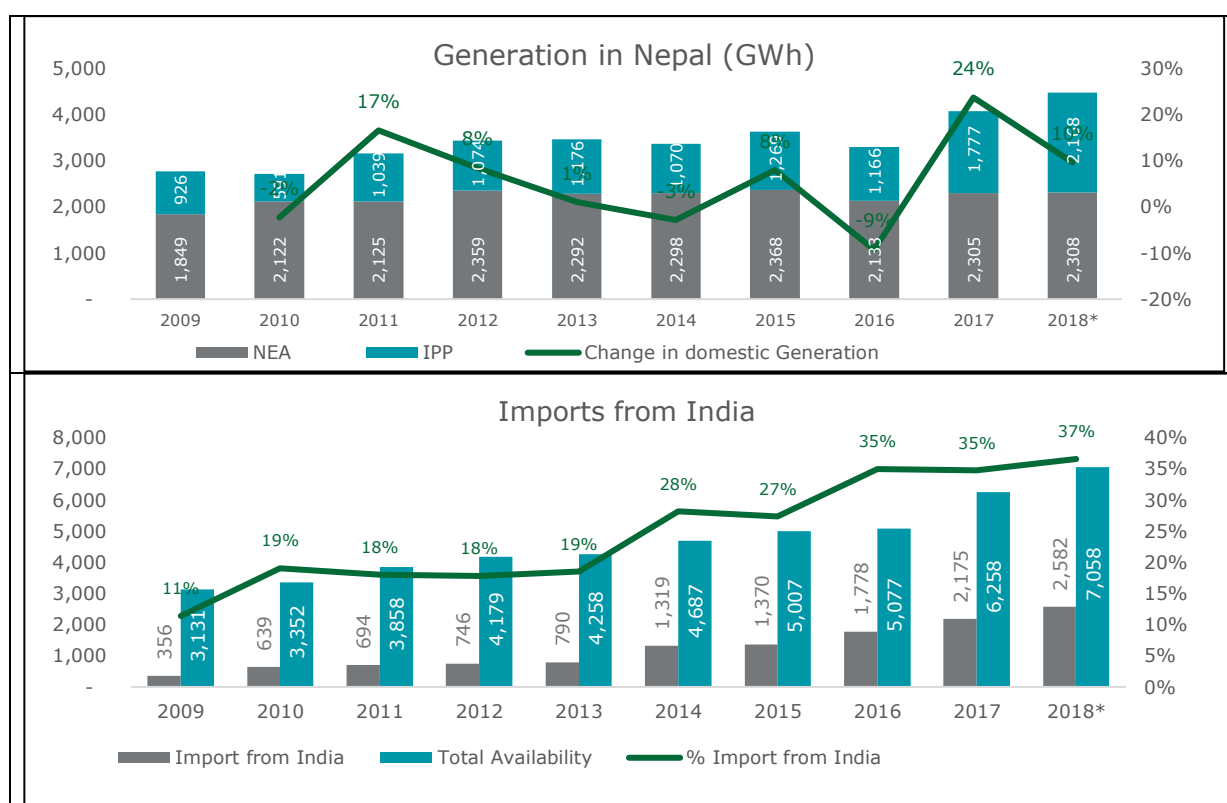
2. Power Market Analysis

This chapter presents the key inferences on Nepal and India power market analysis. Key inferences on Bangladesh power market is covered in Annexure 1.

2.1. Nepal power sector – overview

Nepal is highly dependent on run-of-the-river hydro power to meet its power supply needs. The Demand-supply gap in Nepal has led to increase in electricity imports from India. Commercially exploitable hydro potential in the country is estimated at 42 GW and the domestic capacity has grown at CAGR of 5.5% over last 10 years despite the huge demand supply gap. High dependence on run-of-river hydro projects causes seasonal fluctuations in availability.

The available generating capacity in the country is low during dry (winter) seasons when the system demand is around 1,300 MW. The existing demand-supply gap is partly mitigated through cross-border imports from India (521 MW in peak and 425 MW as average drawal) which contributed to 37% of energy availability in Nepal in 2018. As can be seen from the below graph, imports from India have risen from 11% in 2009 to around 37% in FY 2018



Source: NEA annual report

It can be clearly inferred that Nepal's power sector is likely to become self-sufficient in terms of power requirement.

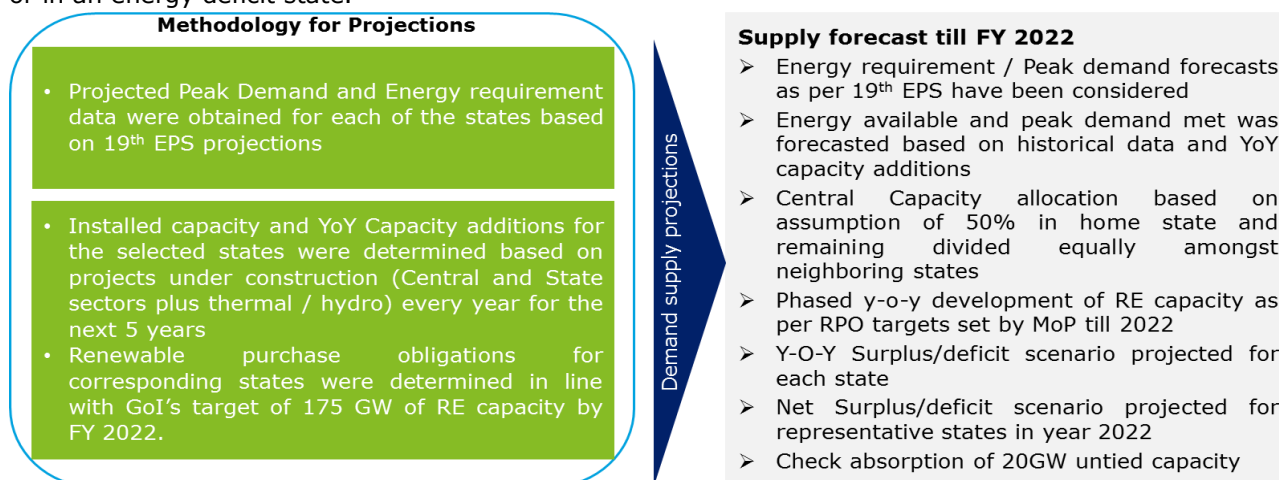
- Hydro capacity which is already under construction and likely to be commissioned over next 2 years is more than 2,500 MW
- Nepal has launched the ambitious programme to achieve 15,000 MW of hydropower in 10 years as envisaged in the White Paper titled "Current Status and Future Course of Energy, Hydropower and Irrigation Sector, 2018 issued by Ministry of Energy, Water Resources and Irrigation (MoEWRI)
- Significant surplus scenario is anticipated during Wet Season in the near term.
- Adequate surplus, exceeding the domestic demand, is expected during the Wet season for the period FY 20- FY 28
- It is pertinent for NEA to trade this surplus power outside of Nepal to guarantee financial sustainability.

2.2. Indian power market– overview

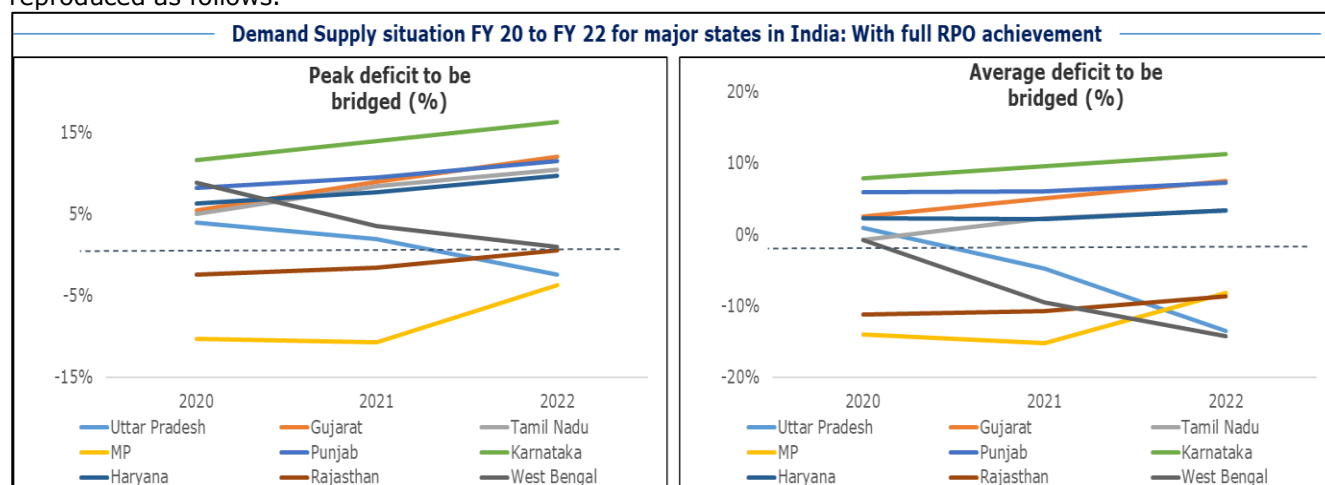
Demand-supply situation

India has transcended from an era of chronic power shortages into an energy surplus scenario over the past 2-3 years. The major reason for this transformative shift is an unprecedented amount of conventional generation capacity addition in the past. Over 55% of this capacity was added by the private sector.

A state-wise analysis of projected demand and supply was carried out to examine the demand-supply gap in the future. For this analysis, few states (9 in number - Uttar Pradesh, Gujarat, Tamil Nadu, Madhya Pradesh, Punjab, Karnataka, Haryana, Rajasthan and West Bengal) which contribute to almost 65% of the overall demand, were analysed based on data provided by these states. Demand supply projections for each of these states were carried out till 2022 and analysed whether they would continue to be in surplus or in an energy deficit state.



Based on the above methodology, demand-supply situation for FY 18 to FY 22 for the selected states is reproduced as follows.



The analysis reveals that:-

- even if some of the states, even though being power surplus in near term (1-2 years), would all be experiencing peak and average demand deficits at the end of 2022 which is expected to continue in medium term as well
- The situation could change significantly if new MOEF norms for coal based power plants are enforced, which would result in > 20 GW capacity retiring due to their inability to meet emission standards.

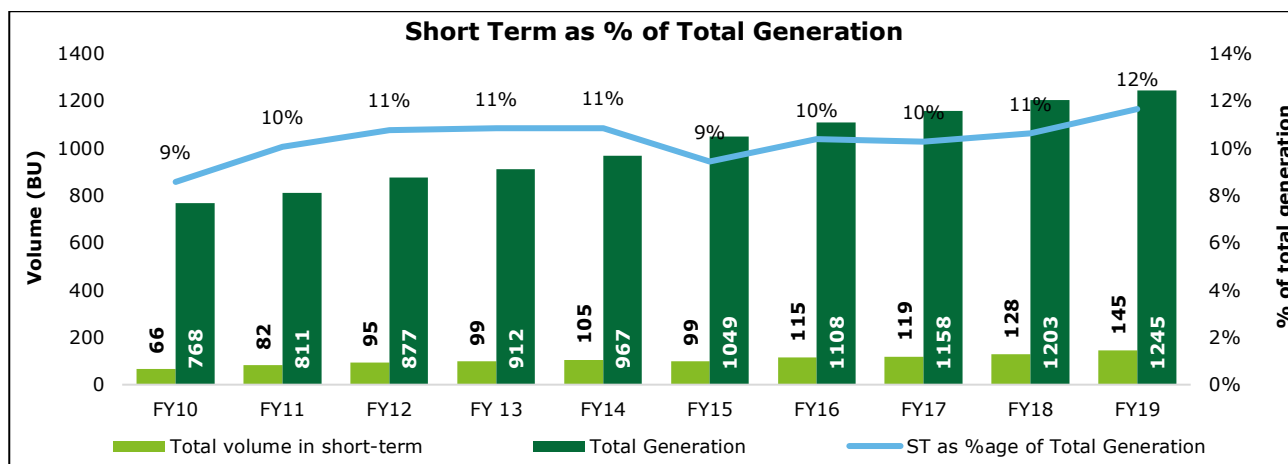
3. Any slippage in RE based capacity addition could lead to increase in peak deficits; many states in India would be in need of peaking power requirement

2.3. India - Short term power market overview

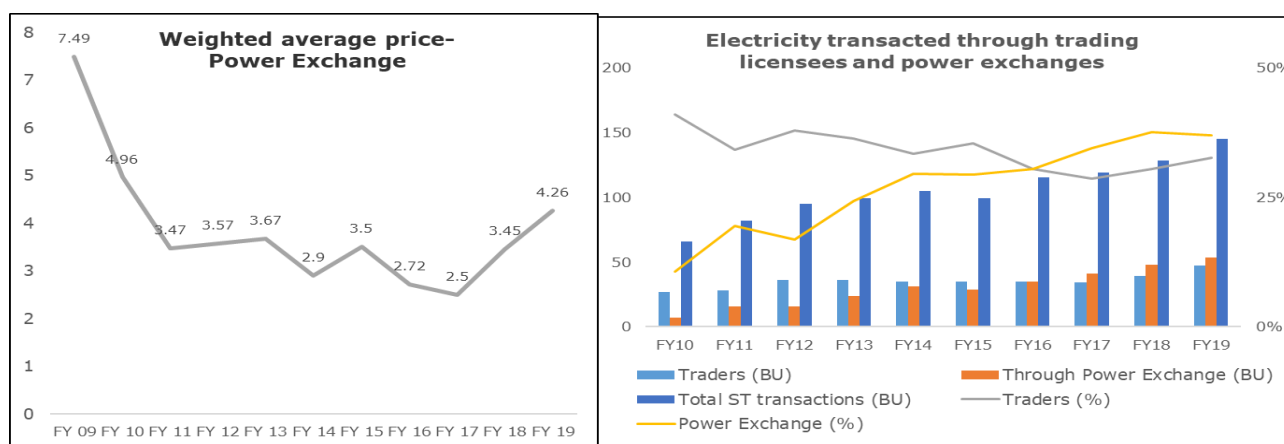
In India, the short-term transactions of electricity refer to the contracts of less than one-year period, for electricity transacted through Inter-State Trading Licensees and directly by the Distribution Licensees, Power Exchanges (Indian Energy Exchange Ltd (IEX) and Unscheduled Interchange (UI). Short-term transactions of Power in India are primarily done through:

- Bilateral agreements – Through inter-state trading licensees
- Power exchanges – transaction in both Day Ahead and Term Ahead Markets
- Real time basis power demand - This is met by drawing Power through Grid under the Deviation Settlement mechanism and for which the Price is linked to frequency.
- Direct transaction of electricity between DISCOMs and banking.

The volume transacted in short-term has increased year on year with the growth in demand and in generation, but the share of short-term transactions as compared with the total generation in the country has remained about 10% for the past 5 years.



Source: CERC



Source: Central Electricity Regulatory Commission

It can be inferred from the analysis that:-

- Study shows that there would be peak deficits in India in the near term. Any slippage in RE capacity addition target or an increase in industrial demand could further make the situation favorable
- India has transcended from an era of energy / peak deficits to surplus situation, however there is a regional variation in demand–supply gap, mainly due to transmission constraints, spatially distributed generation sources, etc.

- Even if some of the states are expected to be in surplus situation in near term (1-2 years), these states are likely to experience peak and average demand deficits by the end of 2022; the trend is expected to continue
- Surplus power availability in Nepal, in the medium to long term, would coincide with the period when India would witness peak and average demand deficits
- The situation could change significantly if new MOEF norms for coal based power plants are enforced, which would result in > 20 GW capacity retiring due to their inability to meet emission standards.
- Any slippage in RE based capacity addition could lead to increase in peak deficits; many states in India would be in need of peaking power requirement
- Short term prices in the Px have witnessed a rise in FY 2018 and FY 2019
- Volume of short term transactions in power exchange has also steadily increased

2.4. Key Drivers for the Power Trading Company in Nepal

Following are the key drivers for the power trading business in the future of Nepal power sector:-

Driver	Details
Regional collaboration	<ul style="list-style-type: none"> • There has been a significant push for regional coordination amongst the SAARC member countries • Ten 400 kV cross border interconnecting lines and one 765 kV transmission line identified under the India-Nepal transmission master plan. Dhalkebar-Muzaffarpur line has already been commissioned. New 400 kV interconnections with India under consideration (New Butwal – Gorakhpur transmission line) • Enabling Regulations issued by India's central regulator (CERC) on Cross Border Trade of Electricity between India and neighboring countries • Bangladesh plans to import 9000 MW power till FY 2040. This could provide an opportunity for export of surplus power from Nepal (Refer Annexure 1)
Bridging seasonal gaps in the demand – supply position	<ul style="list-style-type: none"> • Peak deficit of around 440 MW observed in Nepal in dry season • Nepal is expected to turn fully surplus by 2020-21, especially during the wet season providing an avenue to trade the surplus power and generate additional revenue. • India continues to be a large growing market with regional disparity in demand and supply. Some states in the country are in power surplus whereas the others are in power deficit and hence there is a significant opportunity for power trading. (highlighted in detail in section 2.2)
Market development for large hydro power projects	<ul style="list-style-type: none"> • The commercially exploitable hydro potential in Nepal is estimated at 42 GW from 66 hydropower project sites • There is a need for a power trader to act as aggregator and facilitator of PPAs
Monetizing free power allocated to Government of Nepal	<ul style="list-style-type: none"> • Government of Nepal has the responsibility to monetize the free power available from export-oriented hydropower projects and any other future projects • Cross-border sale of such power would lead to additional revenue generation

Institutionalizing a full-fledged power trading entity within Nepal has the following implications for the Nepal power sector:-

1. Increase in regional activities in South-East Asia
2. Ensuring revenue sources by exploiting the complimentary profiles of surplus and deficit in neighboring countries.
3. Monetizing the surplus power which is expected to be available in Nepal
4. Reducing peak deficits in Nepal
5. Enhance private sector investment in the Nepal power sector
6. Increase in Socio-economic development of the region

3. Possible Business models for NPTC in the current context

This chapter provides a detailed overview of the existing Legal / Regulatory Framework for power trading in Nepal and presents a business model for the Power Trading Company, given the present legal and regulatory framework existing in the Nepal power sector.

3.1. Existing Legal and institutional Framework for power trading in Nepal

A summary of the various regulatory and legal provisions is given below:-

Particulars	Details
Electricity Act, 2049 (1992)	<ul style="list-style-type: none"> Does not recognize trading as a separate activity No process for issuance of trading license No provisions for transmission open access Section 22 provides for export and import of electricity by a Licensee
Electricity Regulations, 2050 (1993)	Emphasis on development of hydropower projects as export-oriented projects by pursuing a strategy of bilateral & regional cooperation.
Hydro Power Development Policy, 2058 (2002)	Emphasis on development of hydropower projects as export-oriented projects by pursuing a strategy of bilateral & regional cooperation.
Electricity Regulatory Commission Act, 2074 (2017)	<ul style="list-style-type: none"> Provisions for regulating the Power Trading business Regulates only the licensees Allowed to determine tariff and trading margin No power to award power trading license

It can be observed that the Electricity Act and subordinate legislations do not explicitly provide for Power Trading as a licensed activity. However, it can be observed that the Regulatory Commission Act recognizes trading as a licensed activity to be regulated by ERC. These suggest that there are regulatory limitations in current legal framework for application to power trading function unless suitable provisions are inserted by the GoN in the current E-Act / Regulations to enable the business of power trading.

The Electricity Regulatory Commission Act has enabling provisions for power trading function as highlighted below:-

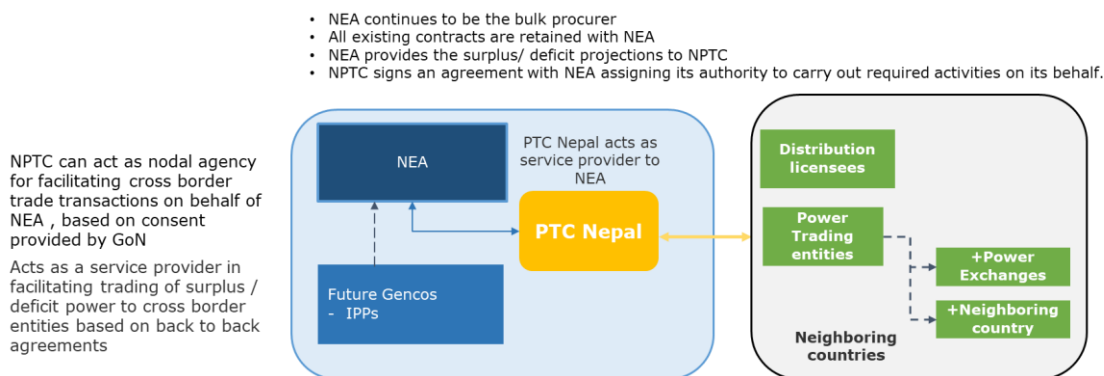
Regulation	Key provisions
ELECTRICITY REGULATORY COMMISSION ACT 2074, (2017)	<p>(2) "Licensed Person" means to the person or corporate body licensed, under the prevalent law to generate, transmit, distribute or trade the electricity. (2)</p> <p>(3) Establishment of the Commission: The Electricity Regulatory Commission has been established as a regulatory body to regulate the generation, transmission, distribution or trade of electricity.</p> <p>(13) Determination of Tariff and Regulation of Sale and Purchase of Electricity ...(1)(b) To determine purchase-sale rate and procedure of sale and purchase of electricity between a distribution licensee and generation licensee, trade licensee and body corporate established by Government of Nepal pursuant to prevailing laws until the establishment of whole-sale market of electricity</p> <p>(14) To Maintain Competition and Protect the Interest of the Consumers ...(h) To prescribe conditions for the conduct of electricity trade and monitor the same on regular basis</p>
Electricity Regulatory Commission Rules, 2018	<p>Clause 10 (1): Commission to regulate sale and purchase of electricity between trading licensees and other licensees The Commission may, develop and implement necessary standards for the purpose of fixation of power purchase/sales rate between the persons obtaining distribution license and the persons obtaining generation license or persons obtaining trade license ...</p> <p>Clause 16: Commission to Regulate Trading Margin:</p> <p>Clause 19 (1): Public Hearing on matters related to trade</p>

The ERC Act and ERC rules, thus, recognizes trading as a separate activity other than the generation, transmission & distribution. ERC will determine and regulate the trading margins and will conduct monitoring of electricity trading. However, the E-Act does not have the enabling provisions for the ERC to issue power trading licenses. It also does not specify required technical / minimum eligibility criteria for becoming a power trader.

3.2. Framework for power trading in the current scenario

Review of the existing legal framework suggests that in the current context, ERC act does not have provision to issue power trading licenses. In such a case, facilitating NEA in trading of surplus / deficit power as a service provider seems to be the only viable option.

Following is the overview of the business model:-



Operational mechanism:-

- Operationalization of NPTC can be initiated with staffing from NEA
- NPTC cannot sign any new PPAs with generators unless licensing provisions are made.
- NPTC will not be able to trade GoN share of free power from existing projects or export oriented projects for which PDA is signed unless suitable provisions related to trading are formulated in E-Act / Regulations.
- Government of Nepal needs to provide consent in the interim phase till new electricity act is enacted for NPTC to act as an agent on behalf of NEA in facilitating cross border trade

4. Business phases for NPTC – current context and post enactment of new E-Act / Regulations

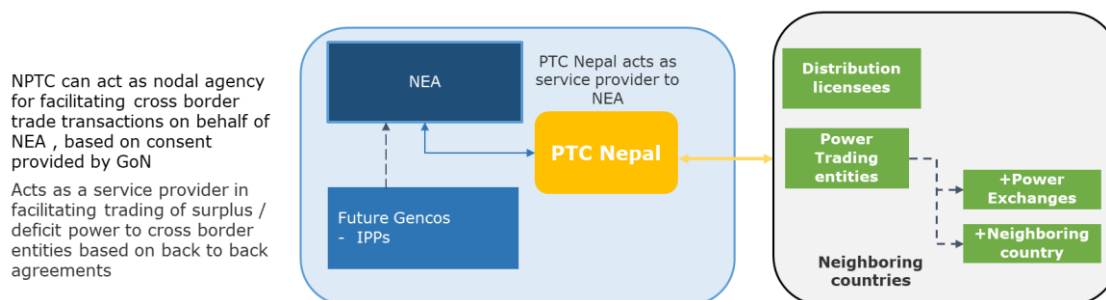
This section details out the business phases for NPTC in the future basis the current context and expected enactment of the new Electricity Act/ Regulations. This section also details out the implementation mechanism for each of the business phases, the transition roadmap for operationalizing NPTC and key roles and responsibilities of each of the stakeholders involved from transitioning to a service provider for NEA to a full-fledged power trading company.

4.1. Strategic Options for Power Trading

In the current context, facilitating NEA in trading of surplus / deficit power as a service provider seems to be the only viable option

Phase 0: NPTC as a service provider to facilitate NEA in trading of power

- NEA continues to be the bulk procurer
- All existing contracts are retained with NEA
- NEA provides the surplus/ deficit projections to NPTC
- NPTC signs an agreement with NEA assigning its authority to carry out required activities on its behalf.



The key operational mechanism for this phase has been presented below.

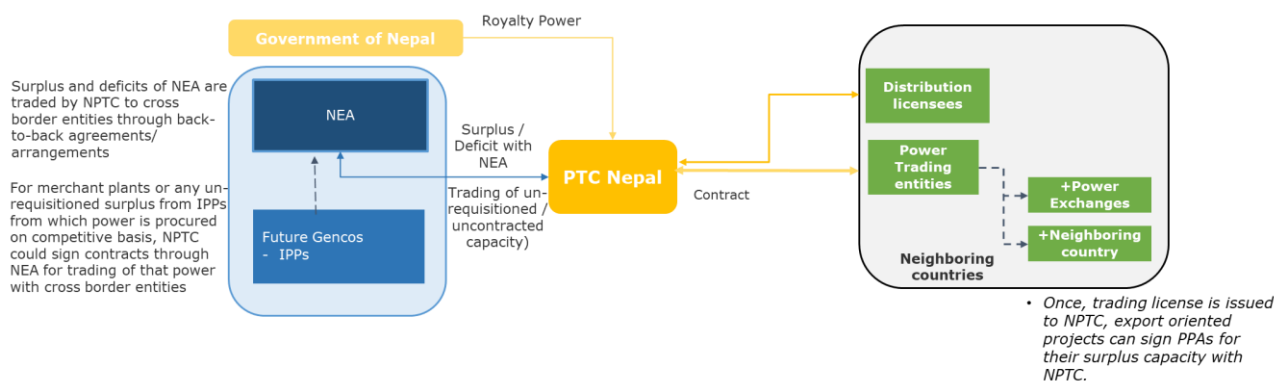
- Operationalization of NPTC can be initiated with staffing from NEA
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- Government of Nepal needs to provide consent in the interim phase till new electricity act is enacted for NPTC to act as an agent on behalf of NEA in facilitating cross border trade

Phase 1: NPTC to manage NEA's surplus/deficit through trading

Post enactment of new E-Act recognize trading as a separate licensed activity, NPTC can act as an independent trader.

However, the prerequisites and enablers for this phase are the following:

- Enactment of new Electricity Act recognizing trading (domestic / CBT) as a distinct licensed activity and specifying required technical / minimum eligibility criteria for becoming a power trader
- Guidelines for cross border trade followed by Regulations determining the trading margin, rules and regulations for trading

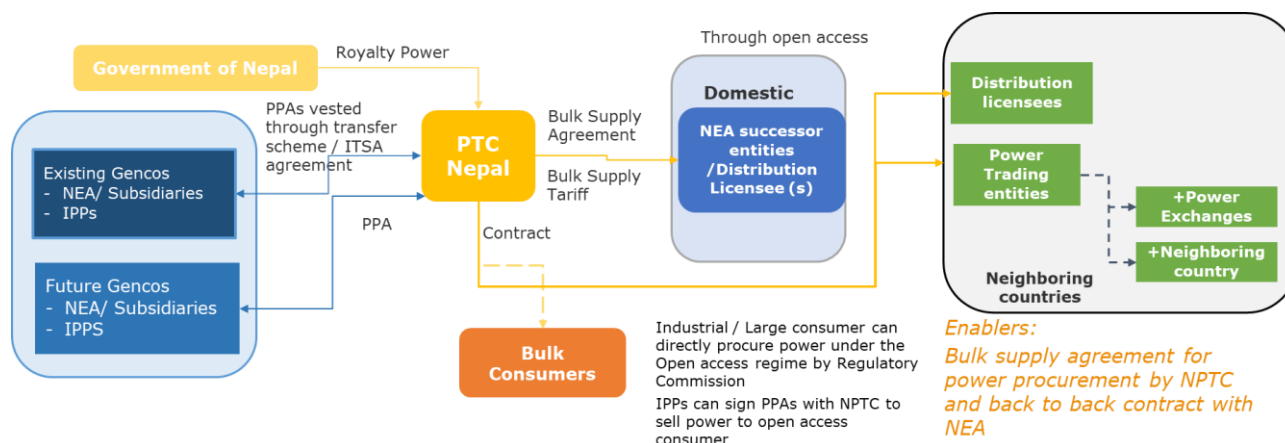


Following are the various pros and cons of this business phase/ model:

Pros	Cons
<ul style="list-style-type: none"> Limited changes in the Electricity Act to enable the power trading function Easy transition from the existing structure to the new framework without changing the contractual framework Can be implemented for cross border trade 	<ul style="list-style-type: none"> Limitations in scaling up to address the priority areas (PPA aggregator, investment enabler) Existing contracts continue to be with NEA. All future PPAs to be signed by NEA

Phase 2: NPTC as bulk supplier and buyer

NPTC can evolve as a Bulk supplier and buyer post power sector restructuring in the future. The overall business model under this option is highlighted as below:-



The pre-requisites and enablers of such a model are as follows:-

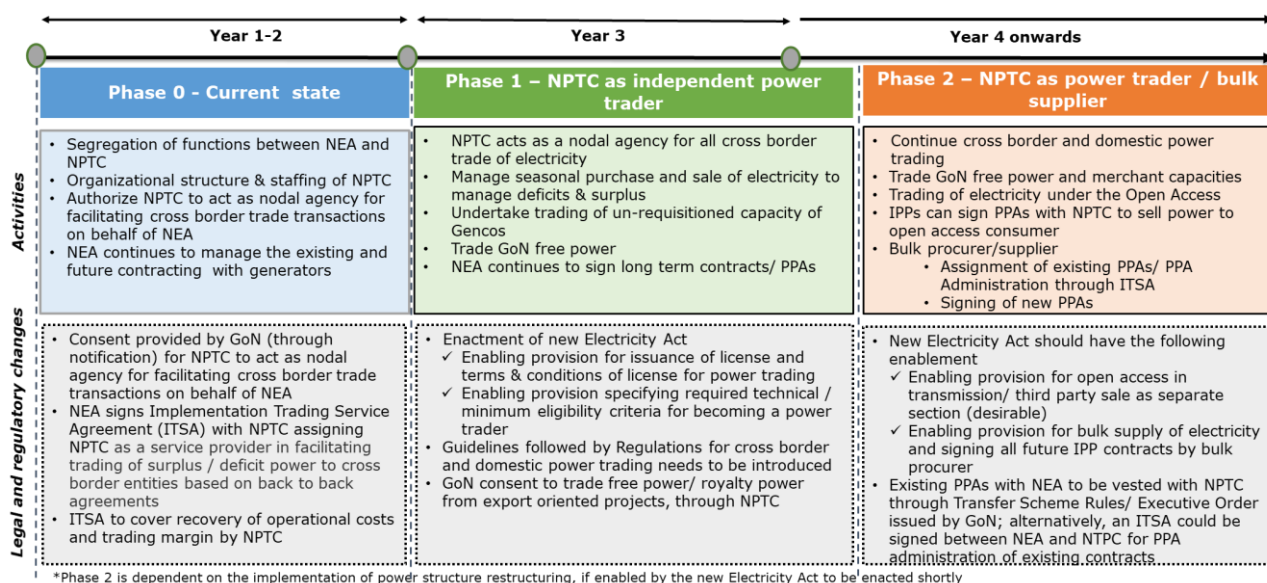
- New Electricity Act to enable provision for bulk supply of electricity, enable role of signing all future IPP contracts by bulk procurer
- Transfer scheme for vesting of existing PPAs to NPTC (alternatively for all existing PPAs, ITSA is signed between NEA and NPTC)
- New Electricity Act to recognize Open Access followed by Open Access regulations

Following are the various pros and cons of such a model:-

Pros	Cons
<ul style="list-style-type: none"> Evolution to bulk supplier option is easy from power trader with changes in the power market structure 	<ul style="list-style-type: none"> Dependent on the future power sector restructuring roadmap

4.2. Transition Roadmap for operationalizing NPTC

The key phases, activities and changes required in legal and regulatory framework for transition is depicted in the chart below:-



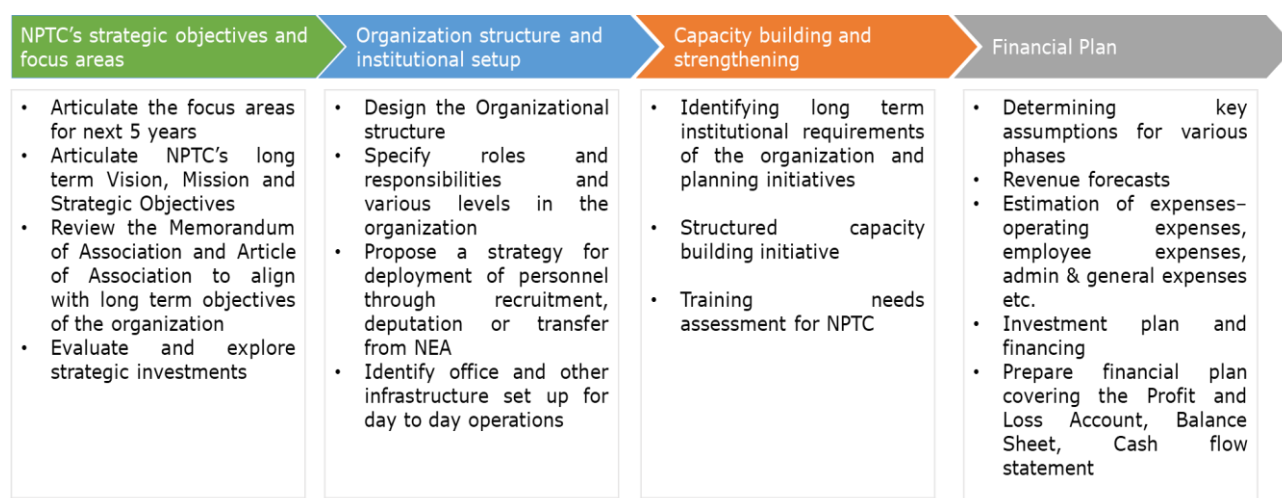
The allocation of roles and responsibilities of key stakeholders is highlighted below:-

	Phase 0: Current scenario	Phase 1: NPTC as independent trader	Phase 2: NPTC as power trader / bulk supplier
NEA	<ul style="list-style-type: none"> NEA continues to be the bulk procurer and is responsible for signing of long term PPAs All existing contracts are retained with NEA NEA provides the surplus/ deficit projections to NPTC on periodic basis (monthly/annual) NEA signs a back-to-back PPA with NPTC for sale/ procurement of power to/from cross-border entities Scheduling & dispatch managed by Load despatch centre (NEA) whereas coordination is responsibility of NPTC for cross border flow 	<ul style="list-style-type: none"> NEA continues to be the bulk procurer of electricity for supply to consumers Responsible for managing the existing PPAs Continue to sign new PPAs with IPPs and NEA subsidiary companies Enters into back to back PPA with NPTC for seasonal requirements (purchase or sale) 	<ul style="list-style-type: none"> NEA be responsible for the supply to consumers. Option of signing back to back PPAs with the generator and power trading company
NPTC	<ul style="list-style-type: none"> NPTC responsible for sourcing surplus seasonal electricity from NEA and sale to cross border entities based on back to back agreements Responsible for negotiations with sellers for procurement of cross border power for NEA Uses NEA's demand forecasting and formulates strategy for contracting with cross border entities in India Coordinates and monitors scheduling and dispatch with load dispatch centre and cross border entities 	<ul style="list-style-type: none"> Act as the Nodal agency in Nepal for the cross border power trading No long term contracts/ PPAs Can undertake trading of un-requisitioned/ short term surplus capacity of Gencos Continues to be government owned entity functioning in regulatory regime Responsible for trading of free power allotted to GoN 	<ul style="list-style-type: none"> Continue with cross border power trading as core business and also add domestic power trading business as and when it is enabled Support the investment facilitation in a limited way by signing PPAs of smaller capacities Sale to large consumers under the open access regime Alternately, as a bulk supplier to the distribution companies, it can be responsible for signing all the new PPAs and assigned the rights to the existing PPAs at the time of separation of function <ul style="list-style-type: none"> Assignment of existing PPAs/ ITSA for PPA admin Signing of new PPAs
GoN, ERC	<ul style="list-style-type: none"> Consent/ Directive for NPTC to undertake trade on behalf of NEA Provisional arrangement for trading margin and cost recovery for NPTC 	<ul style="list-style-type: none"> Enactment of new Electricity Act enabling license issue for trading of electricity Guidelines followed by Regulations for cross border and domestic power trading GoN consent to trade free power from export oriented projects, through NPTC 	<ul style="list-style-type: none"> New Act to enable open access third party sale New Act to recognize bulk supply of electricity and restructuring of electricity industry Transfer scheme for vesting of existing PPAs to NPTC (alternatively ITSA signed between NEA and NPTC for existing PPA administration)

5. Business Plan for NPTC

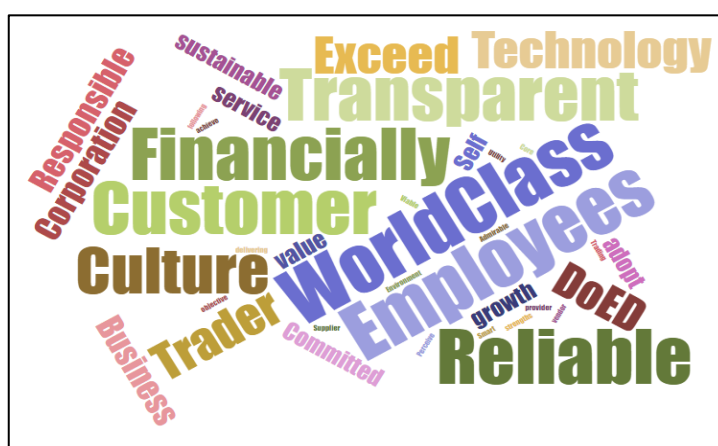
This chapter details out the Business plan for NPTC and highlights the Vision, Mission and Strategic Objectives, Organizational structure and institutional setup, Capacity Building initiatives required and the detailed Financing Plan along-with various scenarios for transitioning to the mentioned business model.

NPTC would need to focus on strengthening its organizational structure and capabilities along with managing changes in the legal and regulatory framework. The NPTC's business plan has been formulated along the key aspects as highlighted below:-



5.1. Vision, Mission and Strategic Objectives

The vision/ mission statements as proposed above have been developed based on extensive deliberations with key stakeholders. A workshop was organized with multiple stakeholders to discuss and understand key objectives and enablers for NPTC. Based on the responses obtained from the participants, the key strategic intent was identified and associated *Word Map* was drawn to understand priority objectives / values for NPTC. The vision and mission statement has been drawn such that they capture the aspirations and communicate a clear perspective of the desired future state of the organization.



Proposed Vision

To be a world class innovative provider of power trading services in Nepal by bringing in efficiencies and transparency in the way power is traded in both domestic and cross border markets

Proposed Mission

- Create value for stakeholders
- Be financially independent and self-sustainable
- Promote power trading in the region for optimum utilization of resources in Nepal
- Support development of power projects in Nepal by creating vibrant electricity market within Nepal

The key focus areas to be prioritized by NPTC over the next 5 years are highlighted in the table below:-

S No	Priority Areas	Option	Legal and Regulatory framework
1	Addressing seasonal variations in electricity requirement in Nepal	NPTC can act on behalf of NEA to engage in domestic and cross-border power trading opportunities	<ul style="list-style-type: none"> • NPTC can act on behalf of NEA to trade in NEA's allocation • Issuance of trading license necessary for undertaking trading (domestic) • Regulations required for power trading
2	Planning and development of cross-border trading	Institutionalize the cross border trading to act as Nodal agency in Nepal	<ul style="list-style-type: none"> • NPTC can be designated as the nodal agency for cross border power trades (GoN being the sole owner can take a decision to this effect as required) • NEA which is currently acting as nodal agency for cross border power trade, can request GoN to appoint NPTC for the nodal agency role
3	PPA aggregator – Existing PPAs	NPTC can take over the existing PPAs and act as bulk supplier for NEA and its successor entities	<ul style="list-style-type: none"> • Assignment of existing PPAs without having enabling legal framework for power trading is not possible • NEA and NTPC can sign an ITSA (Implementation and Trading Service Agreement) through which the execution of the PPAs may be out-sourced to NPTC and all decisions NPTC takes will be deemed equivalent to be taken by NEA. • NEA could continue to be a party in the PPA and pay a suitable ITSA charge for every PPA to NPTC for execution of works
4	Investment facilitation – Signing of New PPAs	NPTC can sign PPAs for the future generation projects where the domestic demand is already fulfilled	<ul style="list-style-type: none"> • Bankability of future PPAs entered into with NPTC would be a challenge unless backed by Government Guarantees or back to back PSAs with NEA • NPTC can sign back to back PSA with NEA or alternately can have a general MoU with NPTC regarding the guarantee and back to back PSA • NEA and seller will have to agree to the arrangement
5	Trade in Government's royalty power in export projects	NPTC can represent GoN to explore power trading opportunities for the available power	<ul style="list-style-type: none"> • Depends on Government's decision on whether to sell it in domestic market or export • NPTC can find better prices in neighboring countries

The Memorandum of Articles (MoA) and Articles of Association (AoA) for NPTC have been formulated. NPTC's Memorandum of Articles has adequate provisions for undertaking the power trading function independently or as nodal agency for cross border power trade. The AoA of NPTC provides for developing/formulating internal rules and bylaws to manage its activities independently.

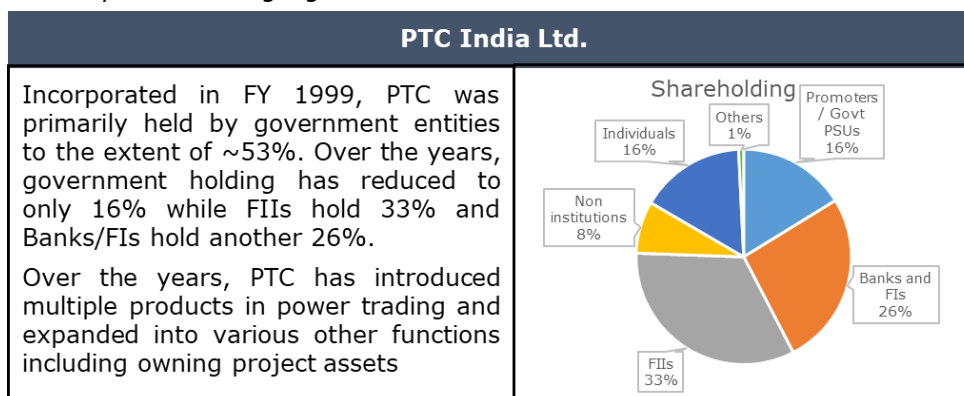
Strategic investments to enable technical competence

Involvement of strategic investors can widen the technical knowhow and bring substantial expertise to NPTC.

- Investors can provide additional funding and help to grow the business in other areas
- Business investors, who are proficient in the power trading business, can share their expertise with the company and contribute ideas for business growth of the company
- Business investors, through their synergies can also deliver local and technical expertise in managing the business.

Possible partners	Details	Key considerations
Regional power trading entities / power exchanges	Regional players like PTC India Ltd as well as IEX	<ul style="list-style-type: none"> • Extensive technical knowhow and sharing of power trading experience • However, participation in neighboring countries could be limited through the power trader only
Banks and Financial institutions	In addition to their function as lenders, they can participate and/or serve on NPTC board	<ul style="list-style-type: none"> • Improves the quality of information FIs have which leads to a more efficient control of the investment activities • Easier access to funding requirement
Private / global companies based out of Nepal	Major players based out of Nepal and having a regional / global presence could be good strategic partners	<ul style="list-style-type: none"> • Access to local and technical expertise as well as ability to exploit synergies

There have been various instances of Power Trading companies in India who have undertaken strategic tie-ups. Sample case study has been highlighted below:-



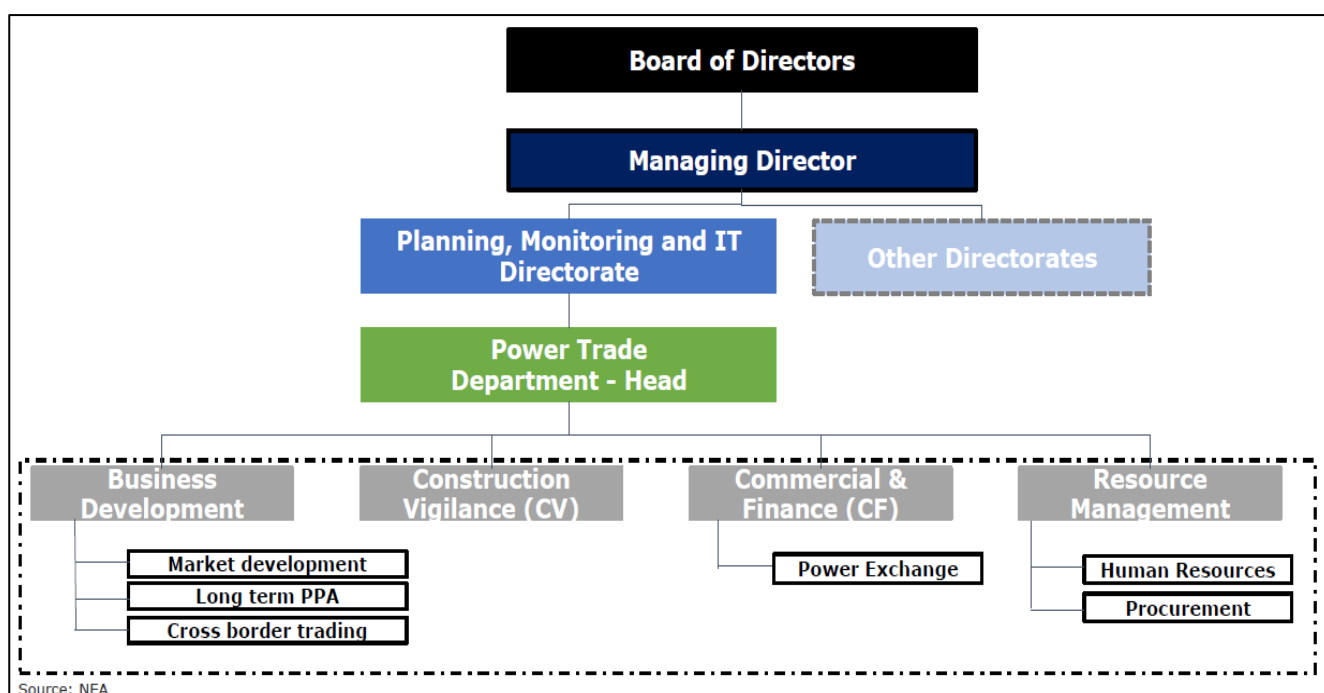
Strategic tie ups with Power Trading entities could be explored for widening the technical expertise and business acumen. However, that could limit NPTC's access to similar other market opportunities

Investments by Banks, FIs could also be considered as strategic for leveraging access to working capital financing and capital financing

5.2. Organization setup

Existing structure of Power Trade Department of NEA

The power trading function in Nepal is presently being undertaken by the Power Trade Department of NEA. The existing organizational structure of Power Trade Department is highlighted below:-



Based on discussions with staff of the Power Trading department, we understand that the expertise/ skill set in Power Trading department is similar to the requirements of the proposed Power Trading Company. Functions relating to management of cross border trading (negotiations, contracting, monitoring) can be transited to the newly formed Power Trading company.

PPA contracting and project monitoring will still need to be retained in NEA as the responsibility for contracting generation and monitoring would continue to be with NEA till the end of Phase 1.

Proposed departments for NPTC

However, to cater to additional business and commercial requirements of the power trading function, NPTC needs to be structured appropriately with key core functions including Business Development, Commercial, and Operations etc. to achieve its objectives of power trading.

In addition to this, support functions involving Finance, Accounts, Human Resource Management, IT support, etc would be required for NPTC. Based on extensive discussions and deliberations with various stakeholders, we have formulated the following roles and responsibilities for various departments of NPTC:-

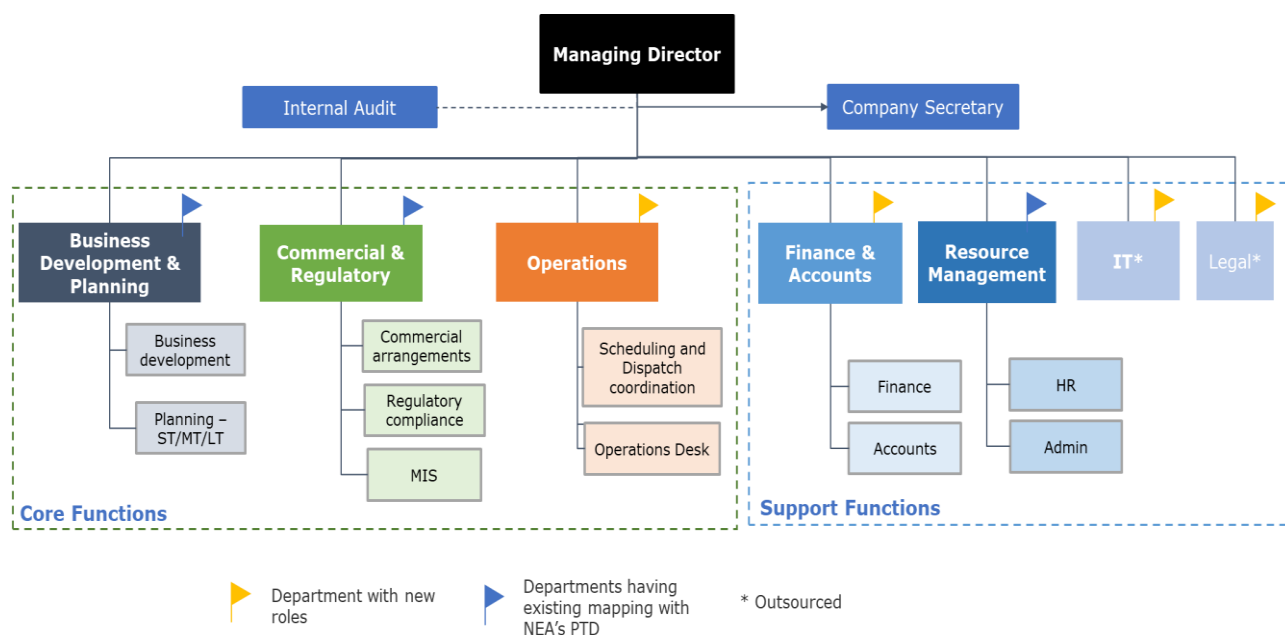
Functions		Key roles and responsibilities	
		Core	
Business Development & Planning		<ul style="list-style-type: none"> Formulating the overall sales and purchase strategy, due-diligence analysis on projects, liaising with generation companies and other consumers, market intelligence on power trade, participating in tenders, etc. Preparing demand-supply forecasts on a periodic basis, Analyzing future purchase requirement from historical MIS data Preparing annual business plans including projections of power trading volumes and market prices 	
		<ul style="list-style-type: none"> Finalization of commercial arrangement like Power Purchase Agreements (PPAs), Power Sale Agreements (PSAs) and other related contractual documents Preparation, negotiations and award of tender documents for short, medium or long term power purchase. Tracking of commercial transactions and settlements and following up on payments. Preparing regular MIS for various managerial levels 	
		<ul style="list-style-type: none"> PPA administration and management Coordination with the load dispatch centers in Nepal and India for scheduling & dispatch of power, liaison with the Distribution utilities and IPPs to process the consent required for open access, Tracking events and regulations that could impact the trading business 	

Functions	Key roles and responsibilities
Support	
Finance	<ul style="list-style-type: none"> Preparation, updating and maintenance of financial and accounting policies & procedures Preparation of financial statements for the company and auditing of the same Reconciliation and maintenance of accounting books / statements Verifying, auditing and passing the bills raised by external parties towards the trading company Account for payments to sellers and receipts from buyers
Resource Management	<ul style="list-style-type: none"> Handling establishment matters of all the staff Training and Development of the employees Human Resource related policy formulation and implementation Managing employee related and other Administration matters
Others – Legal, IT	<ul style="list-style-type: none"> Legal vetting of documents, contracts Advise on legal matters, representation in court of law Operation and maintenance of hardware / software infrastructure, communication links These specialized functions can be out-sourced

A detailed manpower needs assessment will need to be undertaken to determine the number of resources required in each department / core function for effective discharge of day-to-day duties / works.

Proposed Organizational structure for Power Trading Company

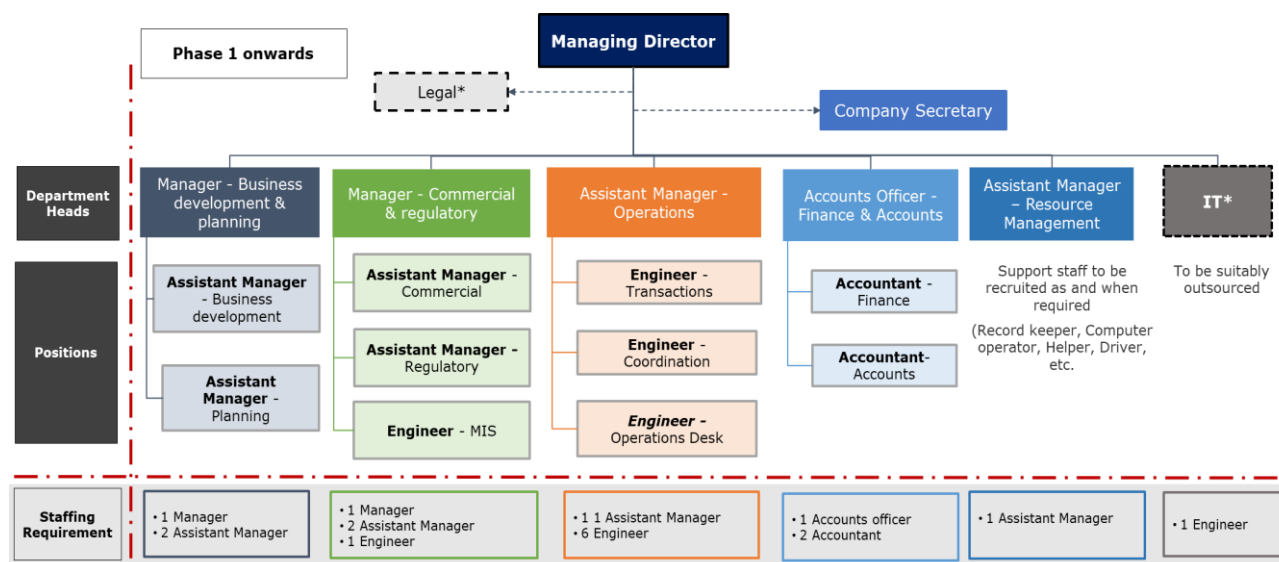
As per the above mentioned functions, the overall institutional setup for the new organization will require creation of new business functions and transfer of existing functions from NEA's Power Trade Department. An illustrative organization structure (Phase 1 onwards) for the newly organized company, as per the Core and Support functions specified above, is laid out as below:-



The functions of Information Technology and Legal wing can be suitably outsourced since this will require specialized skill sets which can be suitably arranged externally. NPTC could focus on the other core areas and support functions.

Proposed Staff Structure – Phase 1 onwards

During Phase 1, Business Development and Planning department will be made independent. Regulatory function will be strengthened and round the clock shift operations introduced for the operations. The detailed organizational structure and staffing plan in this phase is highlighted below:-



Institutional requirements

Following are the various institutional requirements which would be required by the newly formed Power trading company:-

Infrastructure
<p>NPTC would need to develop its own physical infrastructure. The initial set up requirement would include a dedicated office space within NEA or on lease, procurement of software and hardware for day to day operations etc.</p> <ul style="list-style-type: none"> • An office location in Kathmandu would need to be identified which can be taken on lease • Basic infrastructure like furnishing and furniture to be procured during inception phase and address additional requirements for subsequent phases • IT Hardware and communication infrastructure to be developed during each phase as per the requirement • Fleet of vehicles for daily use which can be owned or leased
Systems, tools and processes
<p>NPTC would develop/ procure systems and processes for the day to day operations required for a power trading company</p> <ul style="list-style-type: none"> • Power Trade Software for operations • Creation of Trading Desk / Control Room to function 24*7 for entire 365 days of the year • IT initiatives to strengthen business processes and compliance • Web based tools / mobile application for customer interface and monitoring • Business Continuity and Disaster Management Program to devise the plan in case Business Continuity or Disaster Management is invoked.
Corporate Governance framework
<p>Delegation of power and decision making process</p> <ul style="list-style-type: none"> • The power procurement in real time to short term requires quick decision making and these decisions can sometimes have huge financial implications and so do the lack of response at the right time. • The Managing Director (MD) of the new company will have all executive powers and the Board will have power to make rules and policy to govern the company. • The appropriate delegation of financial powers for the managers would need to be determined and set in such a way so as to enable effective decision making at all levels • The organization would also need to be vested with special powers for taking real-time decisions which could have commercial implications. These, however, need to be supported through appropriate frameworks and decision support tools.
Standardized Templates and frameworks
<ul style="list-style-type: none"> • Contractual frameworks covering seller side and buyer side PPA covering Billing and payment terms, mechanism for payment security (LC/ Escrow), rebates and surcharges, Dispute resolution, etc • HR processes covering recruitment, Compensation & Benefits, recruitment, performance evaluation, training, etc. • Internal Financial controls for ensuring the orderly and efficient conduct of its business, including regulatory compliance and prevention and detection of frauds and errors • Risk Management system to support the delivery of the company's strategy
Working schedule
<ul style="list-style-type: none"> • NPTC would operate for five days a week with 8 hours each day. The envisaged working hours for the general shift operations would be 9.30am - 6.00pm. • There would also be a 24*7 trading desk which would operate round the clock for market and commercial operations, scheduling etc. The same could be operated on a shift basis viz. morning, afternoon and evening shifts

Following are the various tools and processes which need to be developed / adopted by the newly organized Power Trading entity:-

Tool/ process / infrastructure required	Details
Load forecasting tool	<ul style="list-style-type: none"> Trading entity needs to have precision demand supply forecasting as well as price forecasting tools to assess future requirement. Continuous monitoring of peak and off peak loads vis-à-vis short term prices with adequate forecasting and confidence factor. Alerts to be available on all aspects of the forecasts, including price spreads between locations. High/Low price bands based on historical error analysis. Should be able to utilize a dynamic mix of thousands of data elements, including fuel prices, real-time load, capacity, transmission constraints, weather, forecast load, price dynamics, outages, etc.
Scheduling processes	Trading entity would be responsible for coordinating with concerned Load Dispatch Centre on behalf of buyers / sellers for scheduling their power on the transmission corridors. Adequate IT infrastructure needs to be in place for the same
Database and Business Intelligence (BI) Module	<ul style="list-style-type: none"> A robust database which can store historical market data/information on 5 minute block basis for Day Ahead and Real Time Markets, run in the Power Exchanges of the neighboring markets where NPTC would participate directly or indirectly to trade their power A BI module which would sit on the historical data to perform trend analysis and identify patterns which would help NPTC in decision making and effective risk resolution; For example, NVVN uses SAP BI module for data analysis
Trading platform / desk	<ul style="list-style-type: none"> To carry out day to day power trading activities including entry of trades, validation, confirmation, raising invoices, managing settlements, etc.
Control centre	<ul style="list-style-type: none"> Power Trading requires a constant stream of data on power flow, short term price movements at the power exchanges Trading desk needs access to real time data. A duplicate screen of SCADA system available with Load Dispatch Centres would help in assessing generation – demand balance as well as undertaking analysis of future requirement of power by consumers. During Phase 0 and Phase 1, NPTC can explore option of co-locating with Load Dispatch Centre. An independent operations room can be developed during Phase 2
IT hardware and software	<p>Hardware</p> <ul style="list-style-type: none"> Adequate IT equipment viz. desktops / laptops, servers with enough memory fast processing speeds are required. State-of-the-art systems need to be procured from IT vendors with appropriate Annual Maintenance Contracts to ensure continuous upkeep and maintenance of IT equipment. The procurement of IT hardware can be initiated during Phase 1 with adequate provisions for scalability for future requirements <p>Software</p> <ul style="list-style-type: none"> For a trader, a Business Intelligence (BI) solution and a SCADA enabled screen to monitor all the generation on real time basis is required. The price information is tracked and fed into the data module for historical price analysis to take positions in day-ahead / real time market. Procurement of software can be initiated once the operations have stabilized during Phase 1
Communication	<p>Internet Access</p> <ul style="list-style-type: none"> A fast and seamless internet connectivity is critical for the operations of power trading company which requires constant monitoring and quick response to real time situations Back up plans in case of service disruptions needs to be in place Access to employees through web based tools/ apps can be provided to ensure minimal impact of any disruptions <p>Communication links</p> <ul style="list-style-type: none"> This requires on the part of the trader to have communication link with buyers, sellers, load despatch centres, cross border entities, transmission utilities. Such communication link may be direct (phone, fax), via internet or any other media of communication. The procurement can be initiated during phase 1
Contractual documents	<p>Standard documents need to be developed and be available with the department for day to day operations from the inception phase. . This includes:</p> <ul style="list-style-type: none"> Proposal templates for tendering Standard bidding documents Acceptance letter to seller / buyer, Transmittal letter to Contracts/Finance/Operations department for execution of contract Standard PPA format
Resource Management Processes	<p>Recruitment</p> <ul style="list-style-type: none"> For recruitment of new staff, NPTC needs to have clearly spelt out job descriptions and framing of roles / responsibility for all departments, levels.

Tool/ process / infrastructure required	Details
	<ul style="list-style-type: none"> Focus should be given to personnel with technical expertise and educational qualifications in the field of engineering, economics, finance etc. for filling up the posts through recruitment / deputation or taking advisors/ consultants for specific roles. Each designation should have a clearly spelt out job description along with roles / responsibilities (Refer Annexure 1 for sample JDs) NPTC should have clearly defined policy for deputation, recruitment or short term consultants/ advisors to fulfil the requirement of expertise in the field of Power Trading, system operation, Commercial and regulatory matters, Financial, legal, etc.

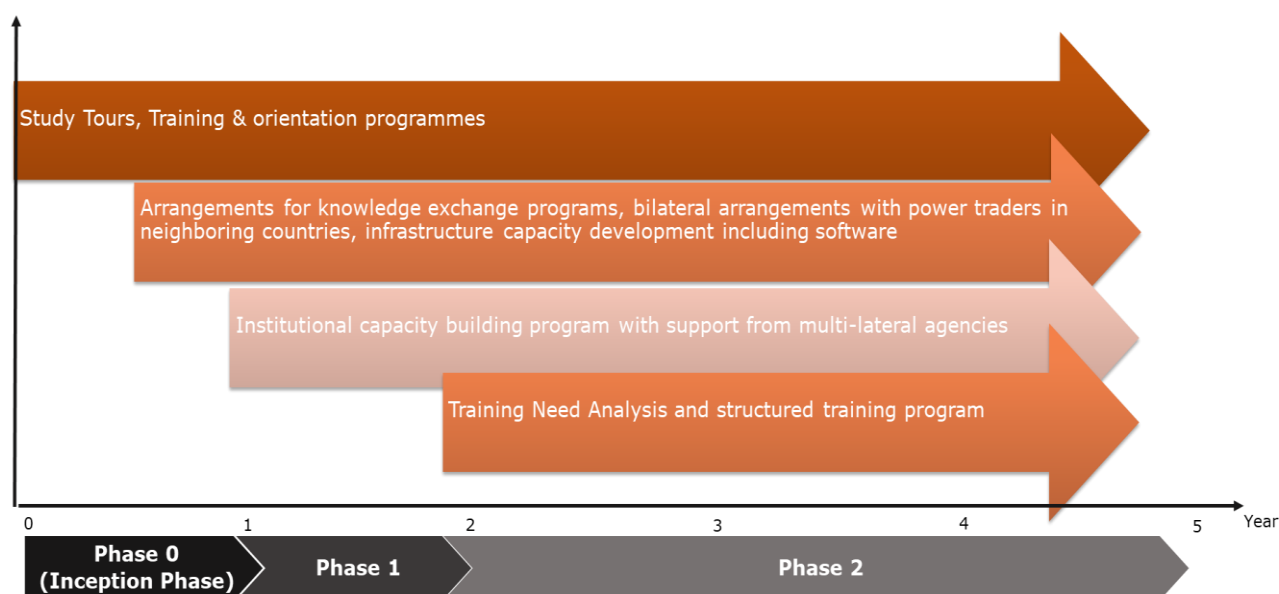
5.3. Capacity building initiatives

Capacity building would enable the company and its managerial and technical staff to develop competencies and skills that can make them more effective and responsive to the changing business requirements. Charting out a long-term capacity building plan will help to obtain, improve, and retain the skills, knowledge, tools, equipment, and other resources that are needed to do the jobs competently.

NPTC needs to create various support mechanisms for Power Trading functions. Capacity building and handholding support would be required to be provided to key officials / staff of NPTC through exchange programmes, training courses and knowledge transfer mechanisms. Following is an overview of the areas of support which would be required for the newly organized company and the mechanism by which the same should be provided.

Key requirements	Challenges	Areas of support	Mechanism/ Initiatives
Operational expertise - Real time decision support	<ul style="list-style-type: none"> Limited access to information and lack of exposure to power trade experience in the region Limited or no expertise in various facets of power trading activities No training facilities in the country 	Establishing a power trading desk which has access to real time data for quick decision making Training and learning courses in appropriate software tools	<ul style="list-style-type: none"> Recruitment of international experts/ advisors through short term contracts Develop annual training calendar and tie up with reputed institutions in the region Refresher courses for the operational staff with hands on training in other countries
Commercial arrangements for cross border trading	<ul style="list-style-type: none"> Basic understanding on cross border/regional power markets Limited experience of operation in a real time / day ahead market No regulatory experience for Nepal power market 	Develop expertise in contracting, broaden understanding of requirements of Indian and other power markets in the region, standardize documents, prepare for regulatory compliance in domestic and international power market	<ul style="list-style-type: none"> Exposure to power markets in South Asia, specifically India, through study tours and conferences Exchange programs / collaboration with power traders, power exchanges in the region
Standardize tools, processes and procedures for transparent market functioning	<ul style="list-style-type: none"> Lack of infrastructure for data collection and processing system, limited automation of processes 	Support in evolving guidelines, protocols for an open and transparent power market with focus on automation through IT tools	<ul style="list-style-type: none"> Initiating a structured institutional capacity building program for the new power trading entity with specific focus on cross border trading On-job training through hiring experts

Training and development of officials / staff during transition phase as well as going forward in to the future would improve technical and managerial competence in handling of Power Trading business. Developing adequate organizational capacity and strengthening the institutional framework would require a multi-prong approach for training and development of personnel. We propose the following roadmap for various capacity building measures:-



5.4. Financial plan

The general purpose of developing the financial plan is to provide information about the results of operations, financial position, and cash flows of the organization. This information will be used by the readers of financial statements to make decisions regarding the allocation of resources. At a more refined level, there is a different purpose associated with each of the financial statements.

The income statement informs the reader about the ability of a business to generate a profit. In addition, it reveals the volume of sales, and the nature of the various types of expenses, depending upon how expense information is aggregated. When reviewed over multiple time periods, the income statement can also be used to analyze trends in the results of company operations.

The purpose of the balance sheet is to inform the reader about the current status of the business as of the date listed on the balance sheet. This information is used to estimate the liquidity, funding, and debt position of an entity, and is the basis for a number of liquidity ratios.

Finally, the purpose of the statement of cash flows is to show the nature of cash receipts and cash disbursements, by a variety of categories. The financial statements would also be utilized by lenders for taking credit decisions and by investors to undertake investments decisions in various avenues.

Assumptions used for the financial model

Assumptions on phasing of business operations

Based on the roadmap for implementation as highlighted in the previous section, the following project timelines have been used to construct a financial model:-

Phase 0	Phase 1	Phase 2
<ul style="list-style-type: none"> Period: FY 20 – FY 22 NPTC undertakes trading based on GoN's consent No power is traded separately by NPTC No margin is claimed on power traded on behalf of NEA Only operating cost is recovered from NEA on cost reimbursement basis 	<ul style="list-style-type: none"> Period: FY 23 NPTC acts as full fledged power trading company All Cross-border trade takes place through NPTC Power trade quantum is the projected surplus/deficit in Nepal after banking NPTC earns a regulated margin on the energy traded 	<ul style="list-style-type: none"> Period: FY 24 onwards NPTC assumes the role of bulk supplier All cross-border trade happens through NPTC Power trade quantum is the projected surplus/deficit after banking Additional trading of power from un-requisitioned power from new IPPs NPTC earns a regulated margin on the energy traded through cross border contracts

• Regulated margin assumed to be same as trading margin for licensed traders in India. However, the regulated margin has been considered as a cap value. Actual margin has been determined based on the saleability of the power in wet and dry season basis the varying levels of short term prices in the Indian power exchanges

Capital expenditure assumptions

The capital expenditure for NPTC factory comprises the following:-

- Furniture and fixtures:** There needs to be department-wise procurement of office equipment. We have assumed 4 sets per department at market prices.
- Vehicles:** Four vehicles have been considered- one dedicated for the MD's office and rest to be utilized by departments on a need basis
- Computers and IT equipment:** Four units of computers and related accessories per department have been considered

The capital expenditure is expected to be funded through equity. With increase in operations going forwards, NPTC would need to undertake additional capital expenditure on the above items. Escalation of 8% has been assumed annually. Based on discussion with officials of NEA and detailed secondary assessment of costs, the following capex costs have been assumed:-

Capex	Rate (NPR per unit)
Furniture and fixtures	24,00,000
Vehicle	12,80,000
Computers and IT	96,000
Escalation of 8%	

Employee expenses assumptions

The employee expenses have been assumed as follows:-

- Year wise number of employees:** Assumed as per staffing plan in section 5.2
- Employee Salaries:** Employee grade wise salary packages have been benchmarked to the salary levels of subsidiary companies of NEA. The data for the same has been gathered from NEA
- Employee benefits:** PF contribution and retirement benefits of 10% have been taken on the basic salary; Additional responsibility and management allowance have considered as per data shared
- Escalation:** An escalation of 6% has been assumed annually on the salaries.

Following salary levels per month (NPR per month) for various staffing levels of NPTC have been considered. Salary figures as highlighted below are as per as per current salary structure of NEA and NEA Engineering Company Ltd.:-

Levels	Basic (a)	Grade rate (b)	Total grade no. (c)	Total grade amount (d=b*c)	Total salary e=a+d	Provident fund (f)	Retirement fund (g)	House rent (h)	Responsibility (i)	Perf (j)	Management (k)	Dearness (l)	Festival (m)	Dress (n)	Medicine (o)	Comm (p)	Transport (q)
Level 6	35990	1200	9	10797	46787	10% of total salary	10% of total salary	4000	100%	60%	0	2000	Total salary of 1 month	10000	Total salary of 1 month	200	15
Level 7	38190	1273	9	11457	49647			4000	100%	60%	100%	2000		10000		200	15
Level 8	40380	1346	8	10768	51148			4000	100%	100%	100%	2000		10000		500	20
Level 9	43890	1463	7	10241	54131			4000	100%	100%	125%	2000		10000		500	20
Level 10	47380	1579	6	9476	56856			4000	125%	100%	175%	2000		10000		1000	120
Level 11	54040	1801	6	10808	64848			4000	125%	100%	200%	2000		10000		1000	120

Festival, Dress and Medicines are annual allowances, rest are monthly figures

Operating and Administrative & General expenses assumptions

The following other Operating and Administrative & General expenses assumptions are considered:-

- Office Lease rental: To be paid for office space and at market lease rental rate of 120 NPR per sq. feet per month (Assumed as per standard commercial rates in Kathmandu and other commercial areas). An escalation of 8% has been assumed on the same. A 4000 sq feet of office space is also assumed in the initial year which would increase going forward in the future.
- Admin & General Expenses including
 - Water and Electricity expenses
 - Training and development costs
 - Business Development costs
 - Outsourcing costs: For IT functions
 - Licensing fees and AMC: For the deployment of IT hardware and software, communication links
- Registration & recurring expenses for sale/ purchase of power in Indian power exchange

Following is the detail of various such expenses:-

Expense	Details
Lease Rental	NPR 120 per month (with 8% pa escalation and 4000 sq feet office space)
PX Registration	60.1 Mn NPR (one time) + 5 Mn NPR(annual)
AMC cost for computers and hardware	20% of capex
Electricity cost	11 NPR / kWh (Escalation 3%)
Water expenses	0.6 NPR / sq feet /month
Training expenses	16 Mn NPR (to increase in future years)
Business development cost	As per suitable international benchmarks

Energy balance of Nepal was provided by NEA as a part of the study conducted by World Bank Group on Financial Viability Action Plan for Nepal Power Sector. Assumptions on banking of electricity and export were also finalized as a part of this study. In addition to this, various scenarios to this base case have been developed as a part of this projection.

Regulated trading margin for NPTC has been assumed to be same as trading margin for licensed traders in India. However, the regulated margin has been considered as a cap value and would depend on saleability of power in wet and dry seasons and varying levels of short term prices in the Indian power market.

The energy balance projections are given in Annexure 3.

Financing assumptions

The following table highlights the assumptions used for financing:-

Particular	Units	Value
Equity share	%	100
Interest Rate on working capital loan	%	12

Particular	Units	Value
Interest Rate on cash deficit loan	%	12.5

Other assumptions

Depreciation

The following table highlights the assumptions used for depreciation:-

Particular	Units	Value
Depreciation rate	%	15
Max allowed depreciation	%	90

Tax

The following table highlights the assumptions used for tax rates:-

Particular	Units	Value
Corporate Tax	%	25

As per prevailing corporate tax structure in Nepal

Some other assumptions related to working capital are highlighted in the table below:-

Particular	Units	Value
Working capital receivables	Days	15
Working capital payables	Days	15

Results and sensitivity analysis

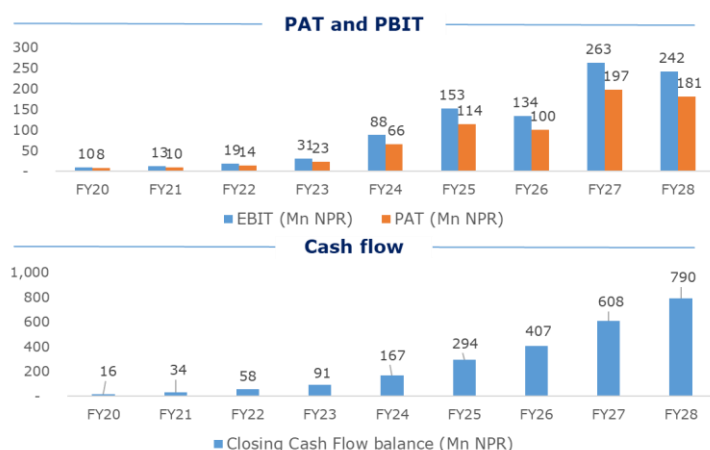
Based on the aforementioned inputs and assumptions, we have considered a base case and scenario analysis to ascertain how the revenue, profits, cash flow and budget requirements would change under each business scenario.

Base case scenario: 50% of surplus (after banking) as export

During the dry season, it is assumed that NPTC would be able to earn the entire margin cap for export of surplus quantum to India. However, during the wet season, NPTC may not be able to realize adequate margin on cross border transactions since it may resort to dispensing off the surplus power to buyers even at lower margins (to enable full offtake of surplus power); NPTC earns a margin of 6.4 p/kWh (similar to trading margin cap in India) during dry season and 3.5p/kWh (~55% of maximum cap on margin) during wet season due to energy surplus situation and reduced ability to earn maximum margin cap.

Results

The profits and cash flow in the base case have been illustrated as below:-



Budget requirement	
Million NPR	Till FY 2022
Capital expenditure	68
Transition support for cost recovery	295
Total	363

The capital Expenditure will be fully funded by government support during the transition. For the transition period, it will be no profit no loss operation. Operating Cost will be recovered from NEA through suitable budgetary provision

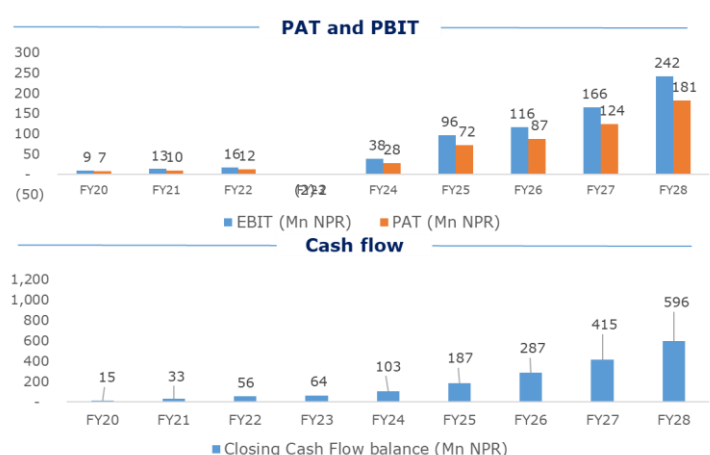
Scenario 1: Delay in commissioning of new IPPs (50% of planned energy availability delayed by one year)

In this scenario, we consider the fact that the quantum of surplus available with NPTC for cross border exports is reliant on commissioning of new hydropower projections in the country. Delays / slippages in commissioning of the same would alter the energy balance of Nepal resulting in changed patterns in surplus / deficit situation in the country. Any such change would alter the nature and quantum of cross border transactions undertaken by NPTC.

We have assumed that 50% of energy quantum of new IPPs (as per base case y-o-y energy balance) is delayed by one year.

Results

The profits and cash flow have been illustrated as below:-



Budget requirement	
Million NPR	Till FY 2022
Capital expenditure	68
Transition support for cost recovery	291
Total	359

Key inferences of the results obtained for base-case scenario are highlighted below:-

- NPTC would need budgetary support of 359 Mn NPR for capex and recovery of costs in the transition period
- NPTC would be able to earn additional revenue over imports since delay in commissioning of new IPPs would necessitate import of additional power to meet domestic requirement

The detailed financial statements are presented in the Annexure 4.

6. Business Risk assessment and mitigation measures

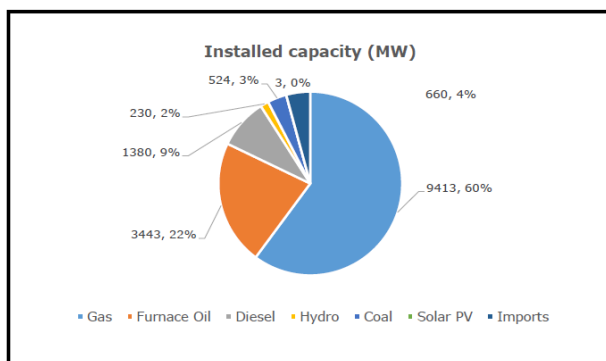
NPTC would face various challenges in its pursuit of Power Trading business. Risk assessments are preventive strategic tools that can help the entity stay on top of adverse situations and respond suitably to various day-to-day challenges. The aim of the risk assessment process is to evaluate challenges and potential threats to the business and then aim to remove them or minimize the level of its risk by adding control measures, as necessary.

Following are the key risks which are expected to arise for the Power Trading company and proposed mitigation steps:-

Type of risk	Details	Mitigation steps
Off-take risk	<ul style="list-style-type: none"> Surplus available with NEA may not find adequate buyers in neighboring countries 2 nos 400 kV interconnecting lines between India-Bhutan existing. 5 nos identified for commissioning by 2030 for import by India; could be a source of competition for Nepal exports Risk of default by buyers would lead to issues in payment to suppliers Credit risk of counter parties Terms of contract may change and an element of take-or-pay may evolve Supplier default in providing power would lead to additional costs for sourcing power from alternative mechanism 	<ul style="list-style-type: none"> Risk of supply offtake can be mitigated through building safeguards in contractual framework like back to back contracting Adequate payment security mechanisms in contracts to cover for credit and default risks and to manage working capital requirements need to be built NPTC needs to explore additional avenues for power trading in future
External risk	<ul style="list-style-type: none"> Changes in Government Policies: Any change in Government Policies having impact on the Generation, Transmission or Distribution or any other activities related to the Power Sector may have an impact on business activities Evolving Regulatory framework: Evolving Regulatory framework can impact both cross border trades as well as domestic trades Impact on trading margin due to changes in the regulations or increased competition in the market can impact profitability 	<ul style="list-style-type: none"> Proactively engage with the concerned stakeholders for the proposed changes in policy frameworks at the regional and country level Develop a mechanism to reach out to alternative buyers to fluctuating demand-supply gaps in certain geographies

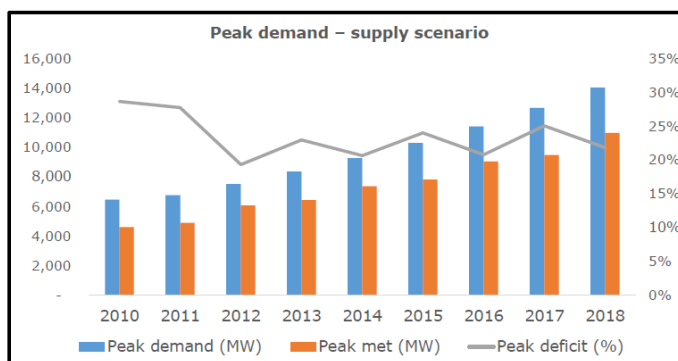
7. Annexures

Annexure-1: Bangladesh –Installed capacity and demand supply scenario



Source: BPDB

~60% installed capacity is of Gas based plants



Source: BPDB

Peak supply deficit has ranged from 20-30% in the last decade
Peak demand growing at ~11.5% per year

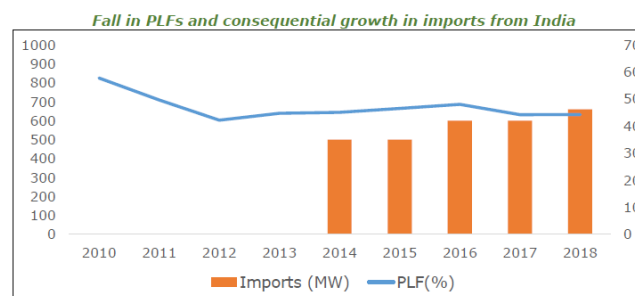
- Bangladesh's power generation sector is heavily reliant on gas based plants for catering to the energy needs of the country
- Bangladesh has had a peak supply deficit of 20-30% since FY 2010 and it is expected that a power deficit scenario is likely to continue in the medium term
- In the public sector, a number of generation units have become very old and has been operating at a reduced capacity.
- Due to shortage of gas supply, some power plants are unable to reach their usual generation capability.

The reasons for lower peak generation with respect to generation capacity were:

- some plants were out of operation for maintenance, rehabilitation & overhauling
- capacity of some plants were derated due to aging and
- shortage of natural gas which is a primary fuel for generation sector

Installed capacity (MW)	Derated capacity (MW)
15,953	15410

Bangladesh's domestic gas reserves are declining, which is the reason that the country is investing heavily in the development of import infrastructure for liquefied natural gas (LNG).



Peak supply deficit has ranged from 20-30% in the last decade

Long term power generation plan of Bangladesh

- A long-term plan of electricity generation against the demand up to 2030 has been incorporated.
 - Under the plan, generation capacity requirement in 2021 will be 24,000 MW against the demand of 20,000 MW and in 2030 generation capacity will be 40,000 MW against the demand of 33,000 MW.
 - Around 50 % power will be generated from the domestic and imported coal and 23 % will be generated from Gas /LNG out of the total generation capacity 40,000 MW in 2030. Other solutions include importing electricity from neighboring countries and expanding use of renewable resources, including solar and wind.
- Bangladesh has a plan to import 9,000 megawatts (MW) of electricity from Nepal to mitigate the increasing demand of electricity by 2040

Annexure-2: Sample Job Descriptions for the key positions

Business Development profile

Parameter	Details
Education	<ul style="list-style-type: none"> Engineer by profession from a recognized educational institution Preference for M.Tech, MBA and other higher educational degrees
Power sector experience	At-least 20 years in Power value chain, out of which 10 yrs in O&M and efficiency activities of electrical systems and 10 yrs in Scheduling, Commercial & Marketing activities of Power.
Key responsibilities	<ul style="list-style-type: none"> Experience in Marketing, Commercial & Power trading activities which includes direct marketing with States, Discoms, Generators, Industries & other stake holders in power sector. Enhancement of image and value of the corporation Experience in conducting Seminars & workshop for the power professionals about Power Market, Grid Operations, Power Transmission, Power Trading etc. Experience in managing the cross border power portfolios with various countries. Must have wide exposure to total value chain in business, dealing with manufacturers, middlemen, retailers & end consumers. Framed & Facilitated PPA & PSA for sale & purchase of power with stakes holders Identifying new businesses / customers, managing customer expectations, satisfaction, market surveillance and intelligence gathering on new developments in power trading Search various websites and contact various buyers Conducting buyer and supplier evaluation, capacity to supply / pay of the counterparties Receiving authorization from generators on payment terms and conditions Communicating results to generators and buyers on results of power exchange bidding Participation in tendering processes by customers including bid preparation, submission and coordination Contract cycle improvement
Soft skills required	<ul style="list-style-type: none"> Experience in leading business development teams, Excellent communication and negotiation skills, Excellent leadership skills, Critical thinker and problem solver, Communication and presentation skills, Excellent command of MS Office

Finance Department

Key activities	Key responsibilities - Manager / Dy Manager
Accounts Officer/ Manager – Finance (Cross border Energy Trading, Cash & Bank, Misc. Party & employee related payments, Taxation & F&A Administration)	<ol style="list-style-type: none"> 1. Reconciliation of Energy Trading related Accounts such as Customer, Vendor, EMD/SD, Purchases, Sales, and Rebate & Margins and confirmation of balances. 2. Processing of bills for Payment. 3. Payment for Energy purchases. 4. Maintain Accounts of receipts of Energy. 5. Audit liasioning related to cross Border trading. 6. Concurrence & vetting of new proposals on Cross Border Trading. 7. Vendor creation/Vendor bank updation. 8. Finalization of Taxes and advance tax payment. 9. Income Tax Returns & Assessments. 10. Perform Tax Audit. 11. Third party vetting & bank payments. <ol style="list-style-type: none"> 1. Bank Payments 2. Investments 3. Physical Verification for fixed assets 4. LC/BG Register & compliance 5. Sanctioning/Review of Limits, CC, LC & BG 6. Credit Rating 7. Monitoring of daily fund position and its Reporting 8. Service Tax (Deduction, Deposit & Filing of Return) 9. Deposit of TDS, Quarterly filing of its return and issuance of TDS certificates including form 16 to employee. 10. Employee related payments including Processing and payment of employee 11. Misc. party payment

Operations Department

Key activities	Details	Responsibility
Energy scheduling	<ul style="list-style-type: none"> Schedules to be sent to LDC on daily basis Mismatch to be pointed out by LDC and corrected by trader 	Control room
Schedule Revision	Revision of schedule to be done on the request of seller or buyer or RLDC	Control room
Cross Border power transactions	Deviation settlement	General shift
Power Exchange	Bidding, result processing and intimation to buyer / seller	Control room / General shift
	Fund management for buying power at exchange, Billing, recovery	General shift
Refund calculation	Refund calculations, sending communication to parties	General shift
Quarterly annual reconciliation	Reconciliation of Open Access, compensation & surcharge billing with Finance / Auditors either quarterly / annual basis	General shift
Dispute resolution	Dispute to be resolved with parties as and when required	General shift
Maintenance of Control room systems and records	Maintenance of equipment like computer, fax, photocopier, telephone, printers and documents	Control room and general shift
Open access	Submitting applications for short term / medium term and long term open access on behalf of generators and buyers to concerned LDCs. <i>In India, there are various Short term open access products viz Advance, FCFS, Day ahead, Contingency based on difference in date of application and date of power delivery. The trader needs to submit application for concerned product categories as required</i>	Control Room (24*7) and General shift
Open access payment and billing	1) Payments to be made in advance to LDC for short term open access 2) Bills to be sent to seller & buyer and to be recovered by due date as per LOI	General shift

Control room personnel would be majorly tasked with operational activities whereas General shift personnel (working during office hours) would be primarily responsible for billing, payments, cross border transactions and dispute resolution

Annexure -3: Energy balance projections for NEA (as per “Financial Viability and Action Plan of the Nepal Power Sector” finalized in June 2018)**Dry Season: Dec to May**

Particulars	Units	FY-20	FY-21	FY-22	FY-23	FY-24	FY-25	FY-26	FY-27
Demand projected by NEA	MUs	5,102	6,048	7,021	7,716	8,489	9,350	10,360	11,487
Energy Generation - IPP +NEA	MUs	4,417	5,456	7,121	8,114	9,633	11,454	12,012	15,225
IPP - Existing		732	839	839	839	839	839	839	839
IPP - New		1,720	2,652	4,317	5,311	6,829	8,651	9,208	12,422
NEA		1,965	1,965	1,965	1,965	1,965	1,965	1,965	1,965
Import	MUs	158	153	127	122	110	91	105	13
Energy Deficit/ Import	MUs	905	1,044	857	882	663	457	828	122
Energy Available	MUs	5,480	6,653	8,105	9,118	10,406	12,002	12,945	15,360
Energy Surplus/ Export	MUs	378	605	1,084	1,402	1,917	2,652	2,585	3,873
T&D Loss	%	17%	16%	15%	14%	14%	13%	13%	12%
T&D Loss	MUs	932	1,064	1,216	1,313	1,436	1,584	1,631	1,843
Sales	MUs	4,170	4,984	5,805	6,403	7,053	7,766	8,729	9,644

Wet Season: June to Nov

Particulars	Units	FY-20	FY-21	FY-22	FY-23	FY-24	FY-25	FY-26	FY-27
Demand projected by NEA	MUs	5,036	5,969	6,930	7,615	8,378	9,228	10,224	11,337
Energy Generation - IPP +NEA	MUs	7,312	9,476	12,894	14,835	17,870	21,145	22,208	27,630
IPP - Existing		1,487	1,645	1,645	1,645	1,645	1,645	1,645	1,645
IPP - New		3,860	5,867	9,285	11,226	14,261	17,535	18,599	24,021
NEA		1,965	1,965	1,965	1,965	1,965	1,965	1,965	1,965
Import	MUs	26	6	3	3	2	1	2	-
Energy Deficit/ Import	MUs	30	30	18	19	9	4	15	-
Energy Available	MUs	7,368	9,512	12,915	14,857	17,881	21,150	22,225	27,630
Energy Surplus/ Export		2,332	3,543	5,985	7,242	9,503	11,922	12,001	16,293
T&D Loss	%	17%	16%	15%	14%	14%	13%	13%	12%
T&D Loss	MUs	1,253	1,522	1,937	2,139	2,468	2,792	2,800	3,316
Sales	MUs	3,783	4,447	4,993	5,476	5,910	6,436	7,424	8,021

Annexure -4: Financial statements**Profit and Loss statement – Base case scenario**

All figures in Mn NPR

Particulars	FY-20	FY-21	FY-22	FY-23	FY-24	FY 25
Revenue	74	102	119	21,373	1,75,555	2,08,211
Power Purchase Cost	-	-	-	21,229	1,75,348	2,07,931
Operating expenses	6	16	7	11	12	13
Employee expense	30	44	62	66	70	74
Admin and general expenses	19	20	21	26	27	27
PBIDTA	18	21	29	41	99	167
Depreciation	8	8	10	10	10	13
PBIT	10	13	19	31	89	154
Interest costs	-	-	-	-	-	-
Interest on WC Loan	-	-	-	0	1	1
Interest on Cash deficit Loan	-	-	-	-	-	-
PBT	10	13	19	31	88	153
Tax expense	3	3	5	8	22	38
PAT	8	10	14	23	66	114

Balance sheet– Base case scenario

All figures in Mn NPR

Particulars	FY-20	FY-21	FY-22	FY-23	FY-24	FY 25
GFA	55	55	68	68	68	85
Accumulated Depreciation	8	17	27	37	47	60
Net Fixed Assets	47	39	41	31	21	25
Current Assets	-	-	-	891	7,315	8,675
Cash	16	34	58	91	167	294
TOTAL ASSETS	63	72	100	1,013	7,503	8,995
Equity	55	55	68	68	68	85
Debt Outstanding	-	-	-	-	-	-
Retained Earnings	8	17	31	54	120	235
Current Liabilities	-	-	-	885	7,306	8,664
Working Capital Loan	-	-	-	6	9	12
Cash Deficit Loan	-	-	-	-	-	-
TOTAL LIABILITIES	63	72	100	1,013	7,503	8,995

Cash flow statement– Base case scenario

All figures in Mn NPR

Particulars	FY-20	FY-21	FY-22	FY-23	FY-24	FY 25
PBIDTA	18	21	29	41	99	167
Corporate Tax	(3)	(3)	(5)	(8)	(22)	(38)
Change in WC	-	-	-	(6)	(3)	(3)
Cash Flow from Operating Activities	16	18	24	28	74	125
Capital Expenditure	(55)	-	(13)	-	-	(17)
Cash Flow from Investing Activities	(55)	-	(13)	-	-	(17)
Debt	-	-	-	-	-	-
Equity	55	-	13	-	-	17
Debt Repayment	-	-	-	-	-	-
Change in WC Loan	-	-	-	6	3	3
Interest	-	-	-	-	-	-
Interest on WC Loan	-	-	-	(0)	(1)	(1)
Interest on Cash Deficit Loan	-	-	-	-	-	-
Repayment of Cash Deficit Loan	-	-	-	-	-	-
Cash Deficit Loan	-	-	-	-	-	-
Cash Flow from Financing Activities	55	-	13	6	2	18
Cash Schedule						
Opening cash balance	-	16	34	58	91	167
Cash generated during the year	16	18	24	33	76	127
Closing Cash Balance	16	34	58	91	167	294



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