

***Business Plan for third
control period of 1st April,
2019 to 31st March 2022***

BEFORE THE

***HON'BLE UTTARAKHAND ELECTRICITY REGULATORY COMMISSION
DEHRADUN, UTTARAKHAND***





यूजेवीएन लिमिटेड

(उत्तराखण्ड सरकार का उपक्रम)

UJVN Limited

(A Govt. of Uttarakhand Enterprise)

कार्यालय कम्पनी सचिव, "उज्ज्वल" महारानी बाग, जी०एम०एस० रोड, देहरादून-248 006 (उत्तराखण्ड) दूरभाष: 0135-2769919, फैक्स 0135-2761549
Office of the Company Secretary, "Ujjwal" Maharani Bagh, G.M.S. Road, Dehradun-248006 Phone 0135-2769919, Fax 0135-2761549
Email: secujvn@ujvn.com Web site: ullarakhandjalvidyut.com Fax 0135-2769919

ISO 9001:2008 Certified

CIN No. U40101UR2001SGC025866

EXTRACT FROM MINUTES OF 91th BOARD OF DIRECTORS MEETING HELD ON 27.11.2018

AGENDA ITEM NO. 91.34

Proposal for Approval of Business Plan of UJVN Ltd. for the Control Period (April, 2019 to March, 2022).

After consideration, the Board passed the following resolution:-

RESOLVED THAT the consent of the Board be and is hereby accorded to approve the Business Plan of UJVNL for the control period April, 2019 to March, 2022 as submitted before this meeting and initiated by Director (Operations) as a token of identification.

RESOLVED FURTHER THAT the Business Plan so approved, shall be submitted to Hon'ble UERC along with the tariff Petition.


30/11/2018

(Arun Sabharwal)
Company Secretary
UJVN Limited
(A Govt. of Uttarakhand Undertaking)
"Ujjwal" Maharani Bagh
G.M.S. Road, Dehradun

CERTIFIED TRUE COPY

FILING No. _____

CASE No. _____

BEFORE THE HON'BLE UTTARAKHAND ELECTRICITY REGULATORY COMMISSION

In the matter of: Filing of Petition for Approval of Business Plan for Third Control Period from FY 2019-20 to FY 2021-22 of UJVN Ltd.

AND

In the matter of: UJVN Ltd. is a Company incorporated under the provisions of the Companies Act, 1956 and having its registered office at "UJWAL", Maharani Bagh, GMS Road, Dehradun.

.....Petitioner

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(Purushottam Singh)
Director (Operation)
UJVN Ltd.
Dehradun

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.....Petitioner

1. Specific Legal Provisions under which the Petition is being filed

1.1 Regulation 8 of UERC (Terms and Conditions for Determination of Multi Year Tariff) Regulations, 2018 (hereinafter referred to as the "Tariff Regulations 2018") specifies as below:

"8. Business Plan

(1) An Applicant shall submit, under affidavit and as per the UERC Conduct of Business Regulations as amended from time to time, a Business Plan by November 30th, 2018, for the Control Period of three (3) financial years from April 1, 2019 to March 31, 2022"

a) The Business Plan for the Generating Company shall be for the entire control period and shall, interalia, contain:

(i) Capital investment plan, which shall include details of the investment planned by the Generating Company for existing stations alongwith its cost-benefit analysis, yearly, phasing of capital expenditure alongwith the source of funding, financing plan and corresponding capitalisation schedule. This plan shall be commensurate with R&M scheme and proposed efficiency improvements for various plants of the company;

(ii) The capital investment plan shall show separately, on-going projects that will spill over into the years under review, and new projects (alongwith

justification) that will commence in the years under review but may be completed within or beyond the tariff period;

- (iii) The Generating Company shall submit plant-wise details of the capital structure and cost of financing (interest on debt and return on equity), after considering the existing market conditions, terms of the existing loan agreements, risks associated in generation business and creditworthiness;*
- (iv) Details related to major shut down of machines, if any;*
- (v) Trajectory of performance parameters;*

1.2 The present petition is being filed under the above provision of UERC (Terms and Conditions for Determination of Multi Year Tariff), Regulations, 2018 for approval of Business Plan of UJVN Ltd for Third Control Period.

2. Limitation

Since an application for approval of Business Plan for Third Control Period by any generating company has to be filed before the Hon'ble Commission before 30th November 2018 therefore, the present petition is not barred by limitation of Uttarakhand Electricity Regulatory Commission Conduct of Business Regulation 2014.

3. Facts of the case

- 3.1. The Petitioner, UJVN Ltd., is a company incorporated under the provisions of the Companies Act, 1956, having its registered office at UJJWAL, Maharani Bagh, GMS Road, Dehradun.
- 3.2. It is humbly submitted that the Government of India (GoI) vide order dated 05.11.2001 transferred all hydropower assets of Uttar Pradesh Jal Vidyut Nigam Limited (UPJVNL) located in the State of Uttarakhand to UJVNL with effect from 09.11.2001. In compliance to the aforementioned order of GOI, the administrative and financial control of all hydro power generation plants of UPJVNL in operation or under construction was taken over by UJVNL with effect from 09.11.2001.
- 3.3. Even though the administrative and financial control of all the generating stations was transferred to UJVNL on 09.11.01, the Corporation still had to initiate discussions with UPJVNL for

formulation of the transfer scheme as per the earlier mentioned order dated 05.11.01 of the GoI on mutually agreed terms.

- 3.4. Government of Uttarakhand (GoU) notified the provisional transfer scheme vide its notification no. 70/ AS (E)/1/2008-04 (3)/22/08 dated 07/03/08.
- 3.5. The Hon'ble Uttarakhand Electricity Regulatory Commission issued the following tariff regulations for hydro generating stations in the State of Uttarakhand, applicable for plants of capacity more than 25 MW:
 - 3.5.1. Uttarakhand Electricity Regulatory Commission (Terms and Conditions for Determination of Hydro Generation Tariff) Regulations, 2004 (hereinafter referred to as the "Tariff Regulations 2004") issued on 14th May 2004. In accordance to the notification dated November 29, 2011, the Tariff Regulations 2004 were valid up to the date March 31, 2013.
 - 3.5.2. Uttarakhand Electricity Regulatory Commission (Terms and Conditions for Determination of Tariff) Regulations, 2011 (hereinafter referred to as the "Tariff Regulations 2011") issued on 19th December 2011. These regulations were applicable from April 1, 2013 to March 31, 2016.
 - 3.5.3. Uttarakhand Electricity Regulatory Commission (Terms and Conditions for Determination of Multi Year Tariff) Regulations, 2015 (hereinafter referred to as the "Tariff Regulations 2015") issued on September 10, 2015. These regulations are applicable from April 1, 2016 to March 31, 2019.
 - 3.5.4. Uttarakhand Electricity Regulatory Commission (Terms and Conditions for Determination of Multi Year Tariff) Regulations, 2018 (hereinafter referred to as the "Tariff Regulations 2018") issued on September 14th, 2018. These regulations are applicable from April 1, 2019 onwards.
- 3.6. Under Multi Year Framework for generating company the petition for approval of Business plan for Control Period from Financial Year from 2019-20 to FY 2021-22 is required to be filed before the Hon'ble UERC on or before 30.11.2018 for determination of Multiyear Tariff for Third Control Period.

- 3.7. In compliance to the regulation 8 of UERC Tariff Regulations, 2018 the petitioner has prepared Business Plan for Third Control Period from FY 2019-20 to FY 2021-22. The Business Plan is enclosed with this petition at **Annexure-I**.
- 3.8. In view of above, the Hon'ble Commission is humbly requested to kindly approve the Business Plan of UJVN Ltd for Third Control Period from FY 2019-20 to FY 2021-22.

4. Cause of Action

The cause of action for the present petition arises on the basis of compliance of the UERC (Terms and Conditions for Determination of Tariff) Regulations, 2018.

5. Ground of Relief

Not Applicable

6. Detail of Remedies Exhausted

Not Applicable

7. Matter Not Previously Filed or Pending With any Court

The petitioner(s) further declares that it has not previously filed any petition or writ petition or suit regarding the matter in respect of which this petition has been made, before the Hon'ble Commission, or any other court or any other authority, nor any such writ petition or suit is pending before any of them.

8. Relief Sought

8.1. Relief Sought from the Hon'ble Commission

8.1.1 *The Hon'ble Commission may kindly approve the Business Plan for UJVN Ltd for Third Control Period from FY 2019-20 to FY 2021-22.*

8.1.2 *The Hon'ble Commission is requested to allow the petitioner to make revision to the current petition and submit additional & relevant information that may emerge or become available subsequent to this filing.*

8.1.3 *Grant suitable opportunity to the Petitioner within a reasonable time frame to file additional material information that may be subsequently*

available;

- 8.1.4 *Condone any inadvertent omissions/ errors/ shortcomings and permit the Petitioner to add/ change/ modify/ alter this filing and make further submissions as may be required at a future date;*
- 8.1.5 *Consider and approve the Petitioner's application including all requested regulatory treatments in the filing;*
- 8.1.6 *Grant the waivers prayed with respect to such filing requirements as the Petitioner is unable to comply with at this stage of filing;*
- 8.1.7 *Treat the filing as complete in view of substantial compliance and also the specific humble requests for waivers with justification placed on record;*
- 8.1.8 *Consider the submissions of Petitioner that could be at variance with the orders and regulations of the Hon'ble Commission, but are nevertheless fully justified from a practical viewpoint;*
- 8.1.9 *Pass such orders as the Hon'ble Commission may deem fit and proper keeping in mind the facts and circumstances of the case.*
- 8.1.10 *Allow petitioner an opportunity for hearing before disallowance in additional capitalization or shifting of Capital expenses to R&M expenses.*

9. Interim Order, in any, prayed for

Not Applicable

10. Details of Index

The detail of Index is given at the beginning of the petition.

11. Particulars of Fee Remitted

The details of the fee remitted are as follows:

Bank Draft	- No. 246714 for Rs. 1,00,000/-
In favour of	- Secretary, UERC, Dehradun
Drawn at	- PNB, Yamuna Colony
Dated	- 29/11/2018



(Purushottam Singh)
Director (Operation)
UJVN Ltd.
Dehradun

12. List of Enclosures

Supporting documents and Annexure mentioned of the petition.

Annexure : Business Plan for Third Control Period from FY 2019-20 to FY 2021-22 for UJVN Ltd.

Dated:

Petitioner

(Purushottam Singh)
Director (Operation)
UJVN Ltd.
Dehradun

VERIFICATION

I, Purushottam Singh S/o Late Sh. Perdiya, aged about 55 years, working as Director (Operations), UJVN Ltd., residing at P-V/1, Yamuna Colony, Dehradun-248001 do hereby verify that the contents of the Paragraph Nos. 1 to 12 of the accompanying Petition are true and correct to my personal knowledge and based on the perusal of official records, information received and the legal advice which I believe to be true.


(Signature of Petitioner)
(Purushottam Singh)
Director (Operation)
UJVN Ltd.
Dehradun

***Business Plan for third
control period of 1st April,
2019 to 31st March 2022***

BEFORE THE

***HON'BLE UTTARAKHAND ELECTRICITY REGULATORY COMMISSION
DEHRADUN, UTTARAKHAND***



UJVN Limited
(A Govt. of Uttarakhand Enterprise)

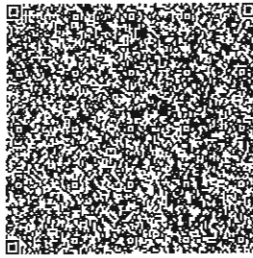


सत्यमेव जयते

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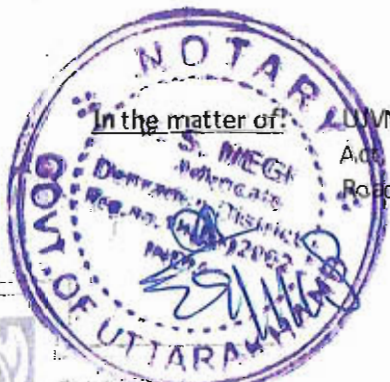


रवि सावधानी से स्टाम्प किं
निर्धारित होकर

BEFORE THE HON'BLE UTTARAKHAND ELECTRICITY REGULATORY COMMISSION
Please write or type below this line.

In the matter of: Filing of Petition for Approval of Business Plan for Control Period from FY 2019-20 to FY 2021-22 of UJVN Ltd.

AND



In the matter of: UJVN Ltd. is a Company incorporated under the provisions of the Companies Act, 1956 and having its registered office at "UJJWAL", Maharani Bagh, GMS Road, Dehradun.

.....Petitioner

(Purushottam Singh)
Director (Operation)
UJVNL Ltd
Dehradun

Statutory Alert

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2. The onus of checking the legitimacy is on the users of the certificate.
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Affidavit

I, Purushottam Singh S/o Late Sh. Perdiya, aged about 55 years, working as Director (Operations), UJVN Ltd., residing at P-V/1, Yamuna Colony, Dehradun-248001 the deponent named above, do hereby solemnly affirm and state on oath as under: -

1. That the deponent, the petitioner in the matter, is the Director (Operations) of UJVN Ltd., Maharani Bagh, G.M.S. Road, Dehradun and is acquainted with the facts deposed below.
2. I, the deponent named above do hereby verify that the contents of the Paragraph No. 1 of the affidavit and those of the Paragraph No. 1 to 4: alongwith Annexure of the accompanying Petition for approval of Business Plan for Control Period from FY 2019-20 to FY 2021-22 of UJVN Ltd are true and correct to my personal knowledge and based on the perusal of official records, information received and the legal advice which I believe to be true and verify that no part of this affidavit is false and nothing material has been concealed.

I, V.S. Chauhan Advocate, D.Su, do hereby declare that the person making this affidavit is known to me and I am satisfied that he is the same person alleging to be deponent.


(Purushottam Singh)
(Deponent)
Director (Operation)
UJVN Ltd.
Dehradun


V.S. Chauhan
(Advocate)

Solemnly affirmed before me on this 29th day of Nov. 2018 at 12:00 a.m./ p.m. by the deponent who has been identified by the aforesaid advocate.

I have satisfied myself by examining the deponent that he understood the contents of the affidavit, which has been read over and explained to him. He has also been explained about Section 193 of Indian Penal Code that whosoever intentionally gives false evidence in any of the proceedings of the Commission or fabricates evidence for purpose of being used in any of the proceedings shall be liable for punishment as per law.



(Notary Public)

This affidavit is sworn before me by
Shri Purushottam Singh
who is identified by Shri V.S. Chauhan
at Dehradun on 29/11/18 Adv

(V. S. NEGI)
Advocate & Notary, D. Su


(ii)

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1. INTRODUCTION

Brief History

The history of UJVNL can be traced back to erstwhile U.P. State Electricity Board (UPSEB). The erstwhile U.P. State Electricity Board was trifurcated pursuant to enactment of U.P. Electricity Reforms Act, 1999. U.P. State Electricity Reforms Transfer Scheme, 2000 was promulgated for execution of the trifurcation of erstwhile UPSEB into U.P. Power Corporation Ltd. (UPPCL), U.P. Jal Vidyut Nigam Ltd. (UPJVNL) and U.P. Rajya Vidyut Utpadan Nigam Ltd. UPJVNL was erstwhile known and setup as UP Alparthak Evam Laghu Jal Vidyut Nigam Limited, a government company which was incorporated in 1985 to own, establish and operate small, mini and micro hydel projects. Later on, the name of the company was changed to UP Laghu Jal Vidyut Nigam Limited and ultimately to UP Jal Vidyut Nigam Limited in 1996. By operation of the aforesaid Transfer Scheme all the Hydro Electric Projects earlier owned and operated by UPSEB were transferred to UPJVNL (a Govt. company existing prior to the said trifurcation) in addition to other projects owned and operated by the UPJVNL previously.

The State of U.P. was bifurcated by enforcement of U.P. Reorganization Act, 2000 (the Reorganization Act) as a result thereof the state of Uttarakhand came into existence. The Govt. of India issued an order dated 05-11-01 u/s 63(4)(a) of the Reorganization Act whereby assets and liabilities between UPJVNL and UJVNL were divided. By operation of this order all the Hydro Power Assets of UPJVNL located in the State of Uttarakhand were transferred to UJVNL. Since then UJVNL is operating all these hydro power plants.

Milestone	Date
UPSEB Unbundled under UPSEB Transfer Scheme	14-01-00
Uttarakhand State Created under UP Reorganization Act	09-11-00
UJVNL formed under Companies Act, 1956	12-02-01
UJVNL Commenced Operations	09-11-01
UJVNL Took Possession of Assets	09-11-01

Vision, mission & values

Vision

The vision of UJVNL is to be a significant player in the National Power Sector and best corporate in Uttarakhand. It aims to be an excellent & efficient organization on the strength of its human resources and induce adjacent infrastructure business that provides opportunities for growth.

Mission

The mission of UJVNL is "Contribution towards improvement in the quality of life in Uttarakhand".


 (Purushottam Singh)
 Director (Operation)
 UJVN Ltd.
 Dehradun

Values

- Creation of value for all stakeholder
- Result oriented with professional work culture
- Earn trust through fair business practices with all
- Growth balanced with environmental protection & enrichment
- Law abiding

Key objectives of the company

UJVNL is a wholly owned Corporation of the Government of Uttarakhand. The main objects to be pursued by the company are as under:

- 1.1.1.1. To establish takeover, operate and maintain power generating stations harnessing the conventional, non-conventional, nuclear and other sources of energy by what so ever name called that include sub-stations, transmission lines, other ancillaries and activities. that are essential for generation, transmission, distribution and trading of power.
- 1.1.1.2. To carry on its activities within the State of Uttarakhand or elsewhere as may be found feasible.
- 1.1.1.3. To make arrangements with any Company, Authority, Government or other persons or institutions for the operation and maintenance of any generating station owned by it (including transmission lines and other works connected therewith) on such terms and conditions as may be agreed upon between it and the Company.
- 1.1.1.4. To take such measures as in the opinion of the Company, are calculated to advance the development of water power in the State of Uttarakhand and may carry out power and Hydro-metric survey work and cause to be made such maps, plans, sections and estimate as are necessary for any of the said purpose.
- 1.1.1.5. To carry out investigation and to prepare one or more schemes relating to the establishment or acquisition of generating stations, tie-lines, sub-stations and transmission lines for promoting the use of electricity within the State of Uttarakhand.
- 1.1.1.6. To operate and maintain in the most efficient and economical manner the generating stations, tie-lines, sub-stations and main transmission lines, owned by the Company.
- 1.1.1.7. To enter into agreement with any licensee licensed under the Indian Electricity Act, 1910 or any other Act, Law of Regulation in force for the time being, or as modified from time to time or with any person for use of any transmission line, distribution line or main transmission line of that licensee or person for such time and upon such terms as may be agreed.
- 1.1.1.8. To enter into arrangement on such terms as may be agreed upon, for the sale of electricity generated by it to the State Electricity Company constituted for

Uttarakhand or for the sale of electricity generated by it to any other state, body, person by itself with the consent of such person or persons duly authorized or licensed under prevalent Laws and Regulations or on its own account.

- 1.1.1.9. To avail such rights, exercise such powers and functions and to perform such duties as are conferred upon or expected of the company under the provisions of such Laws, legislation and regulations as are in force from time to time.
- 1.1.1.10. To do such other acts and things as are authorized to be done under the Electricity (Supply) Act, 1948, or any other Act, Laws or regulations in force or amended from time to time.
- 1.1.1.11. To do such other acts and things as are authorized to be done under Indian Electricity Act, 1910, as amended from time to time.
- 1.1.1.12. Presently, UJVN Limited operates Hydro Power Stations ranging in capacity from 1.5 MW to 304 MW, totaling 1292.10 MW. Though the State was more or less sufficient in energy generation to meet its own requirements at the time of its formation, it is falling short of power at present. As such efficient operation of exiting hydro power projects for economic well-being and growth of the State and its people has become relevant and essential.

Existing Installed Capacity

Currently, UJVN Limited has an installed capacity of 1292.10 MW with installed capacity of Power Stations ranging from 1.5 MW to 304 MW. The salient features of these existing Power Stations are summarized in the Table below.

Table 1: Salient Features of the Existing Power Stations

Sr. No.	Power Station	Installed Capacity (MW)	Year of Commissioning	Type of Scheme	River	Design Head (m)	Design Discharge (m ³ /s)
1	MB-II	304.00	2008	ROR with Pondage	Bhagirathi	247.60	142.00
2	Khodri	120.00	1984	ROR with Pondage	Tons	57.90	200.00
3	Tiloth	90.00	1984	ROR with Pondage	Bhagirathi	147.50	71.40
4	Chilla	144.00	1980	ROR	Ganga	32.50	565.00
5	Chibro	240.00	1975	ROR with Pondage	Tons	110.00	200.00
6	Kulhal	30.00	1975	ROR	Yamuna	18.00	198.00
7	Ramganga	198.00	1975	Reservoir	Ramganga	84.40	235.60
8	Dhakrani	33.75	1965	ROR	Yamuna	19.80	199.20
9	Dhalipur	51.00	1965	ROR	Yamuna	30.48	199.20
10	Khatima	41.40	1956	ROR	Sharda	17.98	269.00
11	Pathri	20.40	1955	ROR	Ganga	9.75	253.00
12	M. Pur	9.30	1952	ROR	Ganga	5.70	255.00
13	Galogi SHP	3.50	1907	ROR	Bhatta	285.00	1.36
14	Dunao SHP	1.50	2017	ROR	Purvi Nayar	47.00	4.60
15	Pilangad SHP	2.25	2004	ROR	Pilang Gad	102.00	2.75
16	Urgam SHP	3.00	1997	ROR	Kalp Ganga	196.50	1.86
Total		1,292.10					

Most of the Power Stations were commissioned by the early 1980's and the oldest Galogi Power Station was commissioned way back in 1907. Thus, it can be said that about more than 3 quarters of the capacity has been in operation for nearly 30 to 60 years and is, almost at the end of the life.

Power Stations except MB-I, MB-II, Chibro, Khodri & Ramganga are run of the river stations and thus are highly dependent on water availability and monsoon for electricity generation. Generation of hydro projects in the last 5 years is summarized in the Table below.

Table 2: Generation of Hydro Projects in UJVN Limited for last 5 years (in MUs)

Sr. No.	Power Station	FY 2013-14	FY 2014-15	FY 2015-16	FY 2016-17	FY 2017-18
1	Chibro	949.79	871.44	814.79	714.00	784.87
2	Khodri	435.79	406.87	376.32	333.28	355.73
3	Dhakrani	170.64	149.51	137.38	120.20	129.68
4	Dhalipur	255.17	231.22	202.24	180.40	186.79
5	Kulhal	178.52	156.11	139.39	122.27	124.21
6	Tiloth	382.18	380.55	484.33	349.72	394.77
7	Dharasu	833.09	888.10	1221.18	1251.85	1276.66
8	Chilla	784.61	800.29	754.80	768.99	812.11
9	Ramganga	233.50	265.67	503.32	180.98	249.82
10	Khatima	114.77	45.17	120.59	180.32	212.54
Total LHPs		4338.04	4194.93	4754.34	4202.00	4527.18
11	Pathri	25.11	96.85	127.11	118.96	135.48
12	Mohd. Pur	41.87	51.82	54.73	52.35	56.46
13	Galogi	2.97	5.34	6.15	6.57	6.99
14	Dunao	NA	NA	NA	NA	2.33
15	Pilangad	NA	NA	NA	NA	0.72
16	Urgam	NA	NA	NA	NA	1.34
17	Other SHPs	3.84	NA	NA	NA	NA
Total SHPs		73.78	154.02	187.99	177.88	203.33
Grand Total		4411.83	4348.95	4942.33	4379.88	4730.51

Three Power Stations, namely MB-II, Chilla and Chibro account for around 61% of the total generation. Out of the above three, Chilla & Chibro are more than 30 years old.

Upcoming Generation Capacity:

UJVN Limited plans to expand its current capacity base and has about 2161.50 MW of Generating Plants in different stages of planning and implementation. The details of the projects planned and currently being implemented by UJVN Limited in the coming years are presented in the Table below.


(Purushottam Singh)
 Director (Operation)
 UJVN Ltd.
 Dehradun

Table 3: Planned Capacity Addition by UJVN Limited

Sr. No.	Name of Project	Estimated Potential (MW)	District	River / Tributary	Expected COD
LHP					
1	Vyasi	120.00	Dehradun	Yamuna	Dec-19
2	Lakhwar	300.00	Dehradun	Yamuna	Mar-21
3	Bowla Nandprayag	300.00	Chamoli	Alaknanda	Sep-21
4	Sirkari Bhyol Rupsiabagar	120.00	Pithoragarh	Goriganga	Sep-21
5	Nand Pyayag Langasu	100.00	Chamoli	Alaknanda	Sep-23
6	Tamak lata	190.00	Chamoli	Dhauliganga	Mar-27
7	Kishau	660.00	Dehradun	Tons	Mar-27
8	Sela Urthing	230.00	Pithoragarh	Dhauliganga	-
SHP					
9	Kaliganga-I	4.00	Rudrprayag	Mandakini/ Kaliganga	Mar-19
10	Kaliganga-II	4.50	Rudrprayag	Mandakini/ Kaliganga	Jun-19
11	Suringad-II SHP	5.00	Pithoragarh	Suringad a tributary of Goriganga	Jun-19
12	Madhmaheshwar	15.00	Rudrprayag	Mandakini/ Madhmaheshwar	Jun-20
13	Kulagad SHP	1.20	Pithoragarh	Kulagad a tributary of Kali river	Jun-21
14	Guptkashi	1.50	Rudrprayag	Mandakini/ Rawangad	Sep-21
15	Purkul	0.80	Dehradun	Kyarkulli	Oct-22
16	Tankul SHP	12.00	Pithoragarh	Shymkholagad a tributary of Kali river	2022
17	Kanchauti SHP	4.00	Pithoragarh	Kanchauti a tributary of Dhauliganga	2022
18	Painagad SHP	15.00	Pithoragarh	Painagad a tributary of Goriganga	2023
19	Jimbagad SHP	12.00	Pithoragarh	Jimbagad a tributary of Goriganga	2023
20	Bhilangana II - A	24.00	Tehri	Bhilangana	2023
21	Bhilangana II - B	21.00	Tehri	Bhilangana	2024
22	Bhilangana II - C (Pokhar)	5.00	Tehri	Bhilangana	2024
23	Tapovan	2.00	Chamoli	Dhauliganga/ Soblagad	2024
24	Pilangad II	4.50	Uttarkashi	Bhagirathi	2024
25	Urgam II	10.00	Chamoli	Kalpganga	2025
Total		2,161.50			


(Purushottam Singh)
 Director (Operation)
 UJVN Ltd.
 Dehradun

Effort towards Diversification of Generation Base

Electricity demand in the state has grown exponentially due to rapid industrialization as a result of industry friendly policies and special package granted to the State by the Union Government. The demand for electricity has been growing year over year and the demand-supply gap is increasing.

At present power generation in the state is wholly dependent on Hydro projects and allocation of power from central pool is not sufficient to meet the requirement of the State. The power deficit becomes acute during winter season as freezing temperatures causes low river discharges leading to lower generation whereas demand goes up significantly.

Bottlenecks in development of Hydro projects

The state could not harness the full potential of Hydro power due to various reasons, notably among them are the inordinate delay in various clearances for the up-coming hydro projects, suspension/closure HEPs like 480 MW Pala Maneri & 381 MW Bhairoghathi projects of State PSU (UJVN Limited), 600 MW Lohari Nag Pala project of NTPC Ltd. by Govt. of India and cancellation of already issued environment clearance to some Hydroelectric projects. Because of these factors the development of hydro power projects in the state is not taking place at desired pace. It is pertinent to mention that due to various environmental, social and religious issues, the development of hydro power in Uttarakhand state has been greatly hampered. Several religious agitations against developments of hydro power projects have resulted in the closure of three aforesaid hydro projects in the state and there is a strong demand for closure of other up-coming projects.

Alternate Resources: Development of Gas based thermal power plant

For the reasons listed in the previous section, the State Government is exploring alternatives to hydro power. In this regard Gas Based Power Projects have been initiated by the State Government (UJVN Ltd, A Govt. Uttarakhand Undertaking) in joint venture with GAIL (India) Ltd. at Haridwar & Kashipur in Uttarakhand, but Government of India has informed that they do not have adequate Gas supply and have expressed its inability to allocate gas to the state for generation in near future.


(Purushottam Singh)
Director (Operation)
UJVN Ltd.
Dehradun

Alternate Resources: Development of Bagasse based thermal power plant

The State Government is also exploring the promotion of Bagasse co-generation in sugar mills for surplus power generation. The details of the same is provided in the table below:

Table 4: Details of Bagasse based Co-generation projects addition by UJVN Limited

Sl. No.	Item	Unit	Nadehi Project	Bazpur Project
1	Capacity	MW	16	22
2	Exportable Energy	MU	64.17	90.74
3	Plant Load Factor	%	45.70%	49.66%
4	Cost of the Project			
	Renovation of Sugar Factory	INR Crore	28.31	38.16
	Power Component	INR Crore	82.69	110.91
	IDC	INR Crore	4.06	5.45
	Total Cost	INR Crore	115.05	154.52
5	Equity	INR Crore	34.52	46.35
6	Loan	INR Crore	80.53	108.17
7	Payback Period	Years	8 to 9	8 to 9
8	IRR	%	16.12	17.42
9	Debt Equity ratio		70:30:00	70:30:00
10	Average DSCR		1.8	1.65
11	Tariff (Cost Plus)*			
12	First Year	Rs. / Unit	4.7	5.1
13	Tenth Year (after repayment of Loan)	Rs. / Unit	3.88	4.17
14	Eighteenth Year	Rs. / Unit	4.45	4.82
15	Expected Period for Implementation after the appointment of EPC contractor		16 – 20 Months	16 - 20 Months

*Generic Tariff allowed by UERC for 2018-19 for Co-generation Project is Rs. 6.94 per unit which include Rs. 3.52 per unit fixed cost and Rs. 3.42 per unit variable cost. Variable cost is subjected to 5% escalation per year.

Status of Projects:

1. A review meeting was taken by Chief Minister on 30th Dec, 2015, wherein Chief Minister, Uttarakhand gave his consent for implementing these projects through UJVNL using its own resources.
2. Meetings regarding Cogeneration from Sugar Mills were held in the Chamber of Chief Secretary, Uttarakhand on 13th Jan, 2016 and 5th Feb, 2016. Chief Secretary, Uttarakhand gave his in-principle approval.
3. DPRs for Cogeneration Projects and Concurrent Sugar Mills Modernization have been approved from UJVNL Board in its 79th Meeting held in June, 2016.
4. Project Development Agreement has been signed with both the sugar factories on 20th Dec, 2017.

5. Offers for debt financing have been received by REC and PFC.
6. Draft PPA have been received from UPCL in Oct, 2017
7. UJVNL has opened an Office of DGM and EE at Kashipur in Nov, 2017 for implementation of these Projects. Officers have already been deputed.
8. Uttarakhand Sugars have given its consent for inviting tenders by UJVN Limited, on their behalf on 20th Jan, 2018.
9. Tenders for Pre-Contract Services have been invited for Co-generation Projects on 1st Dec, 2017 and were opened on 27th Feb, 2018.
10. Tenders were opened on 28th March, 2018 and UJVNL has approved the case on 04th Apr, 2018.
11. Contracts for Pre-Contract Services - all portion of the projects was signed on 05th Sept, 2018 and 06th Sept, 2018.
12. Tenders for EPC and PMC of both the Project is scheduled to be floated in Nov, 2018.
13. Estimated preliminary expenditure for investigation & survey for Kichha project is Rs. 2 Crores in the FY 2019-20.

Table 5: Capital Expenditure during the Control Period on the upcoming BBCGPP (Rs. in Crores)

Sr. No.	Name of the Project	FY 2018-19	FY 2018-19	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
		Apr - Sept (Actual)	Oct - March (Projected)	(Total) (Estimated)	(Projected)	(Projected)	(Projected)
1	Nadehi	-	1.00	1.00	57.00	57.11	-
2	Bazpur	-	1.00	1.00	76.79	76.79	-
3	Kichha	-	-	-	2.00	-	-
Total		-	2.00	2.00	135.79	133.90	-


(Purushottam Singh)
Director (Operation)
UJVN Ltd.
Dehradun

Alternate Resources: Development of Solar Power Plants

For the fulfilment of the Renewable Purchase Obligation (RPO) for solar for Uttarakhand as stated in Uttarakhand Electricity Regulatory Commission (Renewable Purchase Obligation, its compliance & implementation of REC framework), Regulations 2010, UJVN limited has taken several initiatives. UJVNL is currently exploring the feasibility of setting up solar PV based power plants in Uttarakhand. The details of existing projects are provided in the table below.

Table 6: Details of Existing/Commissioned solar power plants.

Sr. No.	Particulars (Current Status)	COD	Type	Power Station Involved	Ownership	Capacity	Actual Investment (Rs. in Cr.)
1	Commissioned	24-Dec-2012	Roof Top Solar PV Plant	Main Head Office "UJJwal" GMS Road Maharani Bagh, Dehradun	UJVN Ltd.	100 kW	2.73
2	Commissioned	31-Mar-2015	Roof Top Solar PV Plant	Pathri Power HEP, Bahadarabad, Haridwar	UJVN Ltd.	500 kW	3.51
3	Commissioned	31-Mar-2016	Grid Connected	Solar PV Project at Dhakrani HEP on BOO basis.	UJVN Ltd.	1.466 MW	12.00
4	Commissioned	30-Mar-2016	Grid Connected	Solar PV Project at Khodri HEP on BOO basis.	UJVN Ltd.	4.398 MW	37.00
5	Commissioned	31-Mar-2017	Grid Connected Canal Bank SPV	Near Dhakrani HEP on BOOT basis.	UJVN Ltd.	7.000 MW	49.41
6	Commissioned	31-Mar-2017	Grid Connected Canal Bank SPV	Near Dhalipur HEP on BOOT basis.	UJVN Ltd.	7.500 MW	52.62
7	Commissioned	31-Mar-2017	Grid Connected Canal Bank SPV	In between Dakpathar Barrage and Dhakrani HEP.	UJVN Ltd.	4.500 MW	26.68
8	Commissioned	31-Mar-2017	Grid Connected Canal Top SPV	Near Dhalipur HEP on BOOT basis.	UJVN Ltd.	1.000 MW	8.90
Total						26.464 MW	192.86

Further, UJVNL has proposed to implement some new solar power plant in future. The details of upcoming projects are provided in the table below.


(Purushottam Singh)
Director (Operation)
UJVN Ltd.
Dehradun

Table 7: Details of upcoming solar power plants

Sr. No.	Particulars (Current Status)	COD	Type	Power Station Involved	Ownership	Capacity	Estimated Investment (Rs. in Cr.)	Remarks	
1	50 kW Rooftop SPV at Ganga Bhawan, Dehradun	2019-20	Roof Top	-	UJVNL	50 kWp	0.30	Based on assessment & software modeling of each site, it can be concluded that the HEP's of Sharada (Khatima), MB I (Tiloth) & MB II (Dharasu) have high potential of constructing grid-connected Solar PV Plants. However, in case of Sharada (Khatima), it is essential that the ongoing legal dispute over the ownership of land is settled in favor of UJVN Ltd. before it can be developed. The HEP's of Chilla has good potential for developing either a storage type or a grid connected Solar PV Power Plant and can be further developed. However, the available land at Chilla HEP is highly distributed and fragmented. The utilization of this land may be a challenge for construction & development and can substantially reduce availability. Ramganga(Kalagarh) HEP does not have good feasibility in terms of suitable land and can support a small storage type system.	
2	80 kW Rooftop SPV at Yamuna Bhawan, Dehradun	2019-20	Roof Top	-	UJVNL	80 kWp	0.48		
3	790 kWp SPV Near Chilla Power House, Near Haridwar.	2019-20	Ground Mounted	-	UJVNL	790 kWp	4.74		
4	5260 kWp SPV Near Khatima Power House, Udham Singh Nagar.	2019-20	Ground Mounted	-	UJVNL	5260 kWp	31.56		
5	205 kWp SPV Near Ram Ganga Power House, Pauri Garhwal	2019-20	Ground Mounted	-	UJVNL	205 kWp	1.23		
6	1370 kWp SPV Near Tiloth Power House, Uttarkashi	2019-20	Ground Mounted	-	UJVNL	1370 kWp	8.22		
7	1670 kWp SPV Near Dharasu Power House, Uttarkashi	2019-20	Ground Mounted	-	UJVNL	1670 kWp	10.02		
8	600 kWp SPV Near Chhibro Power House, Dehradun	2019-20	Ground Mounted	-	UJVNL	600 kWp	3.60		
9	300 kWp SPV Near Kulhal Power House, Dehradun	2019-20	Ground Mounted	-	UJVNL	300 kWp	1.80		
10	500 kWp SPV Near Dhalipur Power House, Dehradun	2019-20	Ground Mounted	-	UJVNL	500 kWp	3.00		
11	5MW Grid Connected SPV near kulhal Power House. Dehradun	2019-20	Canal Bank / Ground Mounted	Kulhal Power House	UJVNL	5 MW	30.00		Land transfer issue.
12	18 MW Canal Top SPV	2019-20	Canal Top	At Power Channel between Ddakpathar Barrage to Kulhal HEP	UJVNL (On Boot Basis)	18 MW	162.00		1. 18 MW Canal Top solar potential (DPR already prepared) still available on Yamuna Power Channel. Work/Process will be started after scheme available from MNRE, GoI. 2. Presently no any scheme regarding Canal Top/Canal Bank from GoI/GoU
13	72.85 MW Canal Top Grid Connected Solar PV Plant on Chilla Power Channel	2021-22	Canal Top	At Chilla Power Channel between Veerbhadra Pashulok Barrage to Chilla HEP	UJVNL (On Boot Basis)	72.85 MW	745.33		1.DPR is Prepared. 2. Presently no any scheme regarding Canal Top/Canal Bank from GoI/GoU.
Total						106.675 MW	1,002.28		

Table 8: Capital Expenditure for upcoming solar power plants (Rs. in Crores)

Sr. No.	Particulars	FY 2019-20	FY 2020-21	FY 2021-22
1	Upcoming Solar Power Plant	256.95	745.33	-

UJVN Ltd. as indicated in the above sections is looking at various sources of generation to augment its existing generation. In the above sections the endeavor of UJVN Ltd. has been to apprise the Hon'ble Commission the status of its initiatives in this regard. UJVN Ltd. shall file before the Hon'ble Commission the initiatives planned by it as soon as they take some concrete shape. At that stage UJVNL shall file before the Hon'ble Commission technical, financial and commercial details of the project for its approval.

The fund projected to be invested in above table includes projects funded by outside agencies developing the solar projects. UJVN proposes to invest Rs. 33.39 crores out of Rs. 256.95 crores projected in FY 2019-20. The entire expenditure of Rs. 745.33 crores projected in FY 2020-21 is to be funded by developers of the projects.

Manpower Planning

UJVN has planned its manpower to meet the requirement in view of the upcoming projects in near future. The existing manpower & projected details for the control period is provided in the table below.

Table 9: Employee details for the control period

Particulars	FY 2018-19			FY 2019-20 (Projected)	FY 2020-21 (Projected)	FY 2021-22 (Projected)
	Apr-Sep (Actual)	Oct-Mar (Estimated)	Apr-Mar (Total)			
Opening No. of employees	2169	2118	2169	2175	2229	2272
Recruitment Plan (including deceased cases)	11	110	121	138	120	110
Retirement / Expired / Resigned	62	53	115	84	77	71
Closing No. of employees	2118	2175	2175	2229	2272	2311


(Purushottam Singh)
 Director (Operation)
 UJVN Ltd.
 Dehradun

2. CAPITAL EXPENDITURE PLAN – UPCOMING PROJECTS

Vyasi Hydroelectric Project (120 MW)

Background

Vyasi HE Project is a run of the river scheme on river Yamuna, powerhouse of which is located near Hathiari village in the district of Dehradun in Uttarakhand. The scheme envisages construction of concrete dam of 86m height known as Vyasi dam located near Judo village (5 Km d/s of Lakhwar dam), 7m dia and 2.7 Km long Head Race Tunnel (HRT), 18m dia. 63.5m high Surge Shaft, 2 nos. 4m dia. 209m long each Pressure Shafts and a Surface Power House to install two units of 60MW each. Water from Vyasi reservoir will be diverted by construction of Vyasi dam through a HRT and this water will be further carried through 2 nos. Pressure Shafts to Surface Power house at Hathiari to generate 120 MW from 2 units of 60 MW each.

The initial work on the project was started in 1979 and main civil works of the project were started in July, 1987 through 2 nos. of contracts for civil works viz. one for Vyasi dam and upstream half portion of HRT and another for Hathiari Power house, Surge shaft, Penstocks and downstream half portion of HRT. Work on this project has been in progress from the year 1987 to 1992 by Irrigation Dept. of erstwhile Uttar Pradesh state. The work on this project was stopped in 1992, and the whole project was handed over to UJVN Ltd. in 2008.

The construction power for the project has been planned from 33.75 MW (3x11.25 MW) Dhakrani power station. For this, three number of 33 KV single circuit transmission line of 25 Km length each from Dhakrani Power station to Lakhwar site was constructed earlier with 2 nos. of arrangements out of above 3 nos. 33 KV lines for power supply to Hathiari substation.

Forest Clearance and Environmental Clearance were also earlier accorded in name of State Irrigation Department which have been transferred presently in favour of UJVNL. The EIA/EMP studies has already been completed by G. B. Pant Institute of Himalayan Environment and Development, Uttarakhand in Dec, 2006. As work on almost all structures was already in progress, land for restarting the work is readily available.

Since Vyasi HE project is the run of the river scheme on river Yamuna located downstream of Lakhwar dam and no storage is involved as such, there is no inter-state issue in case of Vyasi HE Project alone being, a run of the river scheme.

At present civil construction work of the project work is going on all the fronts of the project.


(Purushottam Singh)
Director (Operation)
UJVN Ltd.
Dehradun

Capital Expenditure

The estimated cost of the project at February 2010 price level is Rs. 936.23 Crores including IDC of 72.51 Crores and Rs. 6.55 Crores of Financing Charges. Revised cost has been worked out/calculated including escalation up to Dec, 2019. The revised DPR cost of Rs. 1575.00 Crores which is under process of approval. The project is estimated to get completed by December, 2019. Capital expenditure of Rs. 550.14 Crores is projected to be incurred during the control period. The year wise phasing of the capital expenditure during the control period is shown in the table below:

Table 10: Capital Expenditure during the Control Period – Vyasi Project (Rs. in Crores)

Sr. No.	Particulars	Up to FY 2017-18 (Actual)	FY 2018-19			FY 2019-20 (Projected)	FY 2020-21 (Projected)	FY 2021-22 (Projected)
			Apr-Sep (Actual)	Oct-Mar (Estimated)	Apr-Mar (Total)			
A	Land	40.39	0.30	14.00	14.30	14.00	2.85	-
B	Building	5.54	0.25	4.00	4.25	8.00	1.87	-
C	Major Civil Works	318.19	62.67	206.00	268.67	278.00	56.91	-
D	Plant & Machinery	38.25	9.03	52.00	61.03	78.00	16.95	-
E	Vehicles	3.19	0.50	0.50	1.00	1.00	-	-
F	Furniture & Fixtures	0.56	-	0.20	0.20	-	-	-
G	Office Equipment	0.93	0.08	0.20	0.28	0.30	-	-
H	Others	191.21	5.45	50.00	55.45	75.00	17.26	-
Total		598.26	78.28	326.90	405.18	454.30	95.84	-

Status Update of Capital Expenditure

1. Vyasi is a run-of-river scheme on river Yamuna in Dehradun district.
2. Lakhwar Vyasi Project (420 MW) was originally approved by Planning Commission of Government of India under 5th Plan on dated 09-01-1976 as multipurpose scheme in the state sector for execution by irrigation department of erstwhile Uttar Pradesh. The project was originally approved by Planning Commission with estimated cost of Rs. 140.97 Crores in January, 1976 as multipurpose scheme in the state sector for execution by Irrigation Deptt. of erstwhile Uttar Pradesh. Environmental clearance and Forest clearance were accorded to the project by MOE&F earlier.
3. The initial work of Lakhwar-Vyasi Project was started in 1979 for infrastructural development and preliminary works. The major civil works such as construction of dam, power house, HRT etc. commenced in 1987 for which three major contracts for construction of main civil works of the project were signed in July 1987. The work on this project has been progressing upto 1992 and part construction work on both Lakhwar dam scheme and Vyasi dam scheme has been completed. All works on this project had been suspended since 1992. The construction work on Lakhwar Vyasi Project (420 MW) was done by Uttar Pradesh Irrigation Department from 1987 to 1992. Approximately 30% work was completed during 1987-1992.

4. A revised Detailed Project Report (DPR) was also prepared by State Irrigation Deptt. of UP Government revising the project cost to Rs. 1446 Crores based on March, 1996 price level and the same was submitted to CEA/CWC. Govt. of India order dated 5th November, 2001, with the formation of new state of Uttarakhand in November, 2000, State Government of Uttarakhand restarted the work on this project. State Government of Uttarakhand vide letter No. 1547 even no. dated 3rd October, 2002 conveyed their decision to allot this project in principle to NHPC. A Memorandum of Understanding (MOU) has been signed between Uttarakhand Government, Uttarakhand Jal Vidut Nigam and NHPC on 1st November, 2003 regarding further execution of Lakhwar-Vyasi Project through NHPC. As envisaged in the MOU, DPR of Lakhwar-Vyasi project as multipurpose scheme had been submitted to CWC, Govt. of India, by NHPC in March, 2006.
5. Approval of diversion 868.08 Ha. forest land combined Lakhwar-Vyasi Project in favor of Irrigation Department, Govt. of UP was accorded by MoEF on the year 1986 vide letter no 8-172/86-FRY(cons), dated 31st August, 1986. Out of 868.08 Ha. already transferred forest land, 99.93 Ha land was for Vyasi HEP and balance 768.155 Ha land was for Lakhwar MPP. MoEF vide letter 8-172/1986-FC(pt) dated 14-10-2013 and letter no 8-172/1986-FC_pt) dated 31-01-2014 accorded the approval of Central Govt. for change of user agency from Irrigation department to UJVN Limited in respect of 99.93 Ha. Forest land for construction of Vyasi HEP and 768.15 Ha. of forest land for Lakhwar MPP respectively.
6. The combine Lakhwar Vyasi Multi-purpose project was accorded Environment clearance in 1987 by MoEF vide letter no 3/83/79-HCT/En.V/IA dated 3-02-1987 to Irrigation department of Up erstwhile.
7. Environmental clearance for Vyasi HEP was accorded by MoEF vide J-12011/48/2007-IA.I dated 07-09-2007 to NHPC
8. Later on, GoU allotted the work of lakhwar-Vyasi Project to UJVN Limited on 23rd june, 2008. With the permission of state government Vyasi Project (120 MW) was taken up in first phase.
9. The Environmental clearance of Vyasi HEP was transferred in the favor of UJVN Limited vide- J-12011/48/2007-IA.I dated 22.04.10
10. Revised DPR of Vyasi HEP (120 MW) has been approved by CEA in the month of October, 2011.
11. Total power generation envisaged is 375.24 MUs and in tandem with (post commissioning of) Lakhwar Projects it is 439.80 MUs.
12. The project is estimated to cost Rs. 936.23 Crs. (including IDC & FC) at Feb, 2010 price level as financing charges but excluding transmission cost with levelised tariff Rs. 4.19.
13. Supplementary agreement for Power House and related civil works was executed with M/s NPCC Limited. The date of start of work was 17.10.2013.
14. Construction of balance civil works of Dam and associated structures was awarded to M/s Gammon India Limited with date of start as 20.01.2014.
15. For E&M works, agreement was signed with M/s BHEL on 10.06.2014.
16. For Hydro Mechanical works, agreement has been signed with M/s. OM Metal on 27.01.2016.

17. For installation & operation of stone crusher at Plankhera, the permission was given by GoU to M/s GIL vide letter no779/VII-1/13-stone crusher/2015 on dated 11th June, 2015.
18. Permission of reuse of excavated material has been given by GoU vide OM No. 66/1/2016- 05/104/ on dated 7.1.2016.
19. Regarding allotment of quarry near Kalsi bridge in Yamuna River by GoU, the GoU had given its approval for quarrying including its mining plan however during the process of execution of lease deed with DM, District mining officer has objected that the quarry area falls within 1.00 Km of kalsi bridge & vide GoU order no 618/VII-1/92 rit/2016, dated 24 May-17, the quarrying within 1.0 km U/S & D/S from the bridge is prohibited. The relaxation was requested from the GoU for relaxing the distance to 500 m in place of 1.00 km in U/s & D/s of the Kalsi bridge. GoU vide order no. 1501/111(2)/18-03(Audit)/2009 dated 07/04/2018 has allowed the quarrying beyond 500 m in the U/s & D/s of Multi-span bridges which will be assessed by a committee under the chairmanship of Former Commissioner (Garhwal/Kumaun) & members comprising of Regional chief Engineer of PWD, Regional Chief Engineer of Irrigation Department, Forest Conservator, Director (Mining). Letter from UJVNL to Secretary (Mining) GoU is being written for the formation of committee.
20. Approval of lifting of deposited material from D/s of Dakpathar barrage & to be used at Vyasi HEP is in process with GoU. A joint inspection report has been conducted by Mining Department, Uttarakhand & Revenue department, Uttarakhand. The District Magistrate, Dehradun has issued a letter to the Principal Secretary, Industrial Development Department for allowing the RBM excavated from D/s of Dakpathar barrage to be placed at Vyasi HEP. The pursuance is in progress.
21. Excavation work of dam site has been completed in 2017 and excavation work of Power house has been completed in December 2016. Concrete work is under progress at Power house and dam site. Approximately 2.16 lacs cum. concrete out of total 3.57 lacs cum. concrete has been laid at the dam site.
22. In both the penstock 100 m excavation has been completed from surge shaft side. In the month of September, 2018.
23. In penstock I, 12m excavation has been done and 34m excavation is still remaining.
24. In penstock II, 19m excavation has been done and 25m excavation is still remaining
25. Total 91.56% overt lining in tunnel has been completed.
26. Total 50.11% invert lining in tunnel has been completed.
27. The construction of the project was commenced in year 2014 and expected completion of the project is December 2019.
28. Financial progress till 1st October, 2018 = 70.35%
29. Physical progress till 1st October, 2018 = 73.90%

Financing of Capital Expenditure

The project will be financed with the Debt:Equity ratio of 70:30. Out of Capex of Rs. 550.14 Crores planned for the control period, debt component will be Rs. 385.10 Crores and equity contribution will be Rs. 165.04 Crores. Equity will be provided by GoU from budgetary support envisaged for UJVN Limited. Year-wise allocation of debt and equity for the control period is provided in the table below:

Table 11: Funding Pattern during the Control Period – Vyasi Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Capital Expenditure	405.18	454.30	95.84	-
Debt (70%)	283.63	318.01	67.09	-
Equity (30%)	121.55	136.29	28.75	-

Capitalization Schedule

As per the Commissioning schedule, Vyasi project will get commissioned in December, 2019. The entire capital expenditure of Rs. 1,553.58 Crores will get capitalized in FY 2020-21. Year-wise capitalization during the control period is provided in the table below:

Table 12: Capitalization during the Control Period – Vyasi Project (Rs. in Crores)

Particulars	FY	Amount
Capitalization	2020-21	1,553.58

Lakhwar Multipurpose Project (300 MW)

Background

Lakhwar Project is a part of multipurpose scheme primarily a peaking power station on river Yamuna in the district of Dehradun in Uttarakhand. The scheme envisages construction of 204m high concrete dam on river Yamuna near Lohari village. The Multipurpose scheme also envisages construction of Vyasi HEP (Hathiari power station) downstream of Lakhwar HEP. The scheme also includes construction of a barrage at Katapathar about 3 Km downstream of Hathiari powerhouse station (Vyasi HEP) on river Yamuna. The inflow and stored water in Lakhwar and Vyasi reservoir after generation of power at Lakhwar underground power house and Hathiari power house will be balanced at Katapathar barrage for downstream use. As a result of regulated flow from the Katapathar barrage, it is also assessed that about 75 MU of additional energy would be generated from the existing downstream projects of Uttarakhand state such as Dhakrani, Dhalipur, Kulhal and Khara. The live storage of Lakhwar reservoir is estimated to be 330.66 MCum.

The project was originally approved by planning commission with estimated cost of Rs. 140.97 crores in Jan, 1976 as multipurpose scheme. Environmental clearance was accorded to the project by MOE&F in Feb, 1987.

The initial work of Lakhwar-Vyasi Project was started in 1979 and three major contracts for construction of main civil works of the project were signed in July, 1987. Some construction works such as abutment stripping for Lakhwar dam, construction of 2 nos. diversion tunnels, part excavation of underground powerhouse, part excavation of tail race tunnel etc. at Lakhwar site and abutment stripping for Vyasi dam, excavation of head race tunnel, diversion channel, part excavation of surge shaft, pressure shaft, surface powerhouse, etc. at Vyasi/Hathiari site have been completed. However, the progress on construction of project works suffered and since the end of 1992 almost all the construction works are stopped. A revised Detailed Project Report (DPR) was also prepared by State Government revising the project cost to Rs 1446 cr. based on 1996 price level and the same was submitted to CEA/ CWC.

Capital Expenditure

- 2.1.1.1. Since the end of 1992 works at project sites of Lakhwar and Vyasi were stopped by the then State Govt. After formation of Uttarakhand these projects were handed over to NHPC for its speedy execution through an MOU signed on 1st Nov, 2003.
- 2.1.1.2. NHPC after taking over the sites reviewed design, quantities, hydrology, geology etc. and prepared a new DPR for Lakhwar-Vyasi combined schemes. During the process of preparation of DPR, additional investigation works relating to construction material survey, drifts (2 nos.) and drill holes (3 nos.) at Lakhwar dam site and river bed on Lakhwar dam axis (1 no.) had been done for further geological investigations.
- 2.1.1.3. The project sites are easily accessible by road and approach road to all work sites. Most of residential and non-residential buildings required for the construction of

the project have been constructed at various sites. These residential quarters being very old and most of them lying unused, major repair work is required to maintain these buildings. Land required for starting the work is available.

2.1.1.4. Forest clearance & environment clearance of this project was accorded in 1986 & 1987 respectively in favour of Irrigation Department. MoEF vide letter F.No. 8-172/1986-FC (pt-1) dated 31.01.2014 accorded the approval of the Central Government for transfer of the lease in favour of UJVN Ltd in respect of 768.1552 hectares of forest land already diverted during 1986 in favour of Irrigation Department, GoU for construction of Lakhwar Project. MOEF has conveyed continuity of Environmental Clearance of Lakhwar Project vide letter no. J-12011/32/2010-IA.I dated 10.01.2011.

Status of the project

2.1.1.5. Lakhwar Multi-Purpose project is a storage scheme (204 m high dam) on river Yamuna in Dehradun district. Project in addition to power generation of 300 MW will provide Irrigation to 33780 ha land and drinking/Industrial water benefits of 78.83 MCM also. Water and irrigation benefits from the Project will be shared by Delhi, Uttar Pradesh, Rajasthan, Uttarakhand and Himachal Pradesh. The Project shall also help in controlling flood in River Yamuna as well as its rejuvenation. Total power generation envisaged from project is 572.54 MUs.

2.1.1.6. The Project was declared as National Project wherein 90% of the cost of water component shall be provided as grant assistance by Gol. 30% of the Project construction stands completed.

2.1.1.7. CWC finalized Project Cost as Rs. 3966.51 Crores, cost of Irrigation component as Rs. 2578.23 Crores (90% financing by Gol) and cost of Power Component as Rs. 1388.28 Crores (financing by GoU/UJVNL). Benefit Cost Ratio for Water Component was finalized as 1.59:1.

2.1.1.8. Lakhwar Project was cleared by the Technical Advisory Committee (TAC) of CWC in its meeting held on 14.12.2012 as conveyed vide MOM through letter no. 16/27/2012-PA(N)/8-32 dated 03.01.2013.

2.1.1.9. The forest and environmental clearance were granted by Deptt. of Env. Forest and Wild Life, Gol in Oct, 1986 and Feb, 1987 respectively. MOEF conveyed continuation of earlier Environmental Clearance of Lakhwar Project in Jan-2011. Approval for change of user agency for balance construction of the Project was granted by FAC MoEF in Jan-2014.

2.1.1.10. MoU for Design and Engineering of civil & HM works for the Project was signed with Central Water Commission in Sep-2013 and for Electro-mechanical works with Central Electricity Authority in Aug-2014.

Clearances

2.1.1.11. Investment Committee of MoWR, RD & GR has recommended the Project for Investment Clearance on 24.02.2016. Subsequently, the Ministry has granted investment clearance on 19.04.2016. Cabinet committee approval for central assistance of the Lakhwar project is awaited.

Tender Process

2.1.1.12. Tender will be invited after Cabinet Clearance by MoWR, RD & GR.

Water Share Contribution from beneficiary States

2.1.1.13. Only Delhi has contributed 50% of its state contribution i.e Rs. 7.79 Crores out of Rs 15.58 Crores on 26.03.2018. Other Beneficiary States are also requested contribute their Share.

2.1.1.14. Agreement amongst the States of Himachal Pradesh, Uttarakhand, Uttarpradesh, Haryana, National Capital Territory of Delhi and Rajasthan on construction of Lakhwar Project in Upper Yamuna Basin under the provision of Clause no. 7(ii) of MoU dated 12.05.1994 signed by Hon'ble CMs of basin states for allocation of surface Yamuna water upto Okhla Barrage on 28.08.2018.

PROJECT COST (P.L. MAY-2012)

Cost	(Rs. in Crores)
Civil & HM works	3575.55
E&M works	390.96
Total	3966.51
Cost apportionment	
Water component (65%)	2578.23
Power component (35%)	1388.28

2.1.1.15. 90% cost of Water Component shall be provided as Grant Assistance by MoWR, GR&RD, Gol and 10% by beneficiary States.

2.1.1.16. The Revised Cost Estimate of Lakhwar MPP (300MW) P.L July 2018 for Rs 6795 Cr is submitted on 02-11-18 to CWC for its Approval.

Power Generation

2.1.1.17. Lakhwar Hydro project is a peaking power station with a proposed installed capacity of 3x100 MW. It shall utilize inflow of Yamuna River for power generation. This project will meet peaking demand of state of Uttarakhand which is facing acute power shortage due to thrust on industrialization of state after its separation from Uttar Pradesh.

2.1.1.18. Since Uttarakhand does not have any proven coal reserves and there is no proposal for nuclear installation in the state, it has therefore to rely essentially on its underdeveloped hydro potential for meeting states power requirement.

2.1.1.19. Lakhwar project is geographically very attractive project as it is only 72 km from state capital and most of the infrastructure work is already in place.

2.1.1.20. The unit cost of energy at Bus Bar, considering return of 14% on the Equity invested based on generation in a 90% dependable year with 95% machine availability as approved by CEA are as follows:

Tariff	As per CERC Norms	As per UERC Norms
First Year	Rs 5.60 per kWh	5.28 per kWh
Levelised	Rs 4.79 per kWh	Rs 4.34 per kWh

2.1.1.21. The Capital expenditure of Rs. 2639.46 Crores is projected to be incurred during the control period. The year wise phasing of the capital expenditure during the control period is shown in the table below:

Table 13: Capital Expenditure – Lakhwar Project (Rs. in Crores)

Sr. No.	Particulars	Up to FY 2017-18 (Actual)	FY 2018-19			FY 2019-20 (Projected)	FY 2020-21 (Projected)	FY 2021-22 (Projected)
			Apr-Sep (Actual)	Oct-Mar (Estimated)	Apr-Mar (Total)			
A	Land	-	-	-	-	92.50	92.50	92.50
B	Building	-	-	-	-	25.00	75.00	54.66
C	Major Civil Works	-	-	-	-	194.95	675.00	850.00
D	Plant & Machinery	-	-	-	-	-	-	-
E	Vehicles	-	-	-	-	2.10	2.10	2.10
F	Furniture & Fixtures	-	-	-	-	1.00	1.00	1.00
G	Office Equipment	-	-	-	-	1.25	1.25	1.25
H	Others	-	-	-	5.00	183.20	145.55	145.55
	Total	-	-	-	5.00	500.00	992.40	1,147.06

Status Update of Capital Expenditure

1. Revised DPR with revised cost estimate based on price level of February, 2010 was submitted to CWC on 16th July, 2010.
2. A copy of revised DPR has been sent to member States of Upper Yamuna River Board (UYRB) in 2010 and again in 2012 for their views/comments regarding sharing of benefits. Rajasthan & Delhi have submitted their acceptance regarding sharing the benefits as per the MoU of 1994. Chairman, UJVN Limited has requested Principal Secretary, Irrigation Department, Haryana and Chief Secretary, U.P. for expediting their replies regarding sharing of benefits in continuation to earlier requests of UJVN Limited.
3. Replies to the comments of all the Directorates of CWC were submitted and clearances have been received.
4. The Project has been cleared by the Technical Advisory Committee of CWC in its meeting held on 14.12.2012.
5. The forest and environmental clearance were granted by Department of Environment Forest and Wild Life, GoI in October, 1986 and February, 1987 respectively.

6. MOEF has conveyed continuation of earlier Environmental Clearance for Lakhwar project with additional conditions as specified by the EAC of MoEF.

Financing of Capital Expenditure

2.1.1.22. Project will be financed with the Debt:Equity ratio of 70:30. Out of Capex of Rs. 2639.46 Crores planned during the control period, debt will be Rs. 1847.62 Crores and equity contribution will be Rs. 791.84 Crores. Equity will be provided by GoU from budgetary support envisaged for UJVN Limited while debt is yet to be tied-up with financial institutions. Year-wise allocation of debt and equity for the control period is provided in the table below:

Table 14: Funding Pattern during the Control Period – Lakhwar Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Capital Expenditure	5.00	500.00	992.40	1,147.06
Debt (70%)	3.50	350.00	694.68	802.94
Equity (30%)	1.50	150.00	297.72	344.12


 (Purushottam Singh)
 Director (Operation)
 UJVN Ltd.
 Dehradun

Kishau Hydro Electric Project (660 MW)

Background

Kishau Dam Project would utilize the water of river Tons which is a major tributary of river Yamuna and forms boundary between Himachal Pradesh and Uttarakhand in most of its reaches in this region. The water stored in the Kishau reservoir shall be utilized for irrigation, power generation and to augment drinking water supply for National Capital Delhi.

The project with a proposed installation of 660 MW (4 x 165 MW) is envisaged to generate an annual energy of 1379 MUs in a 90% dependable year with 95% of Installed Capacity.

Status Update

- 2.1.1.23. Kishau project is a storage scheme on river Tons in Dehradun district, which in addition to power generation of 660 MW will provide Irrigation to 97076 ha and drinking/Industrial water benefits of 617 MCM also. As the project has been declared as National Project, financial assistance would be provided to the extent of 90% of the cost of water component as grant assistance by Govt. Sharing of water and Irrigation benefits among Yamuna Basin States presently is as per MoU of 1994 which is to be finalised by CWC / MOWR.
- 2.1.1.24. Water and irrigation benefits from the Project will be shared by Delhi, Uttar Pradesh, Rajasthan, Uttarakhand and Himachal Pradesh. The Project shall also help in controlling flood in River Yamuna.
- 2.1.1.25. Project cost excluding IDC is Rs 7193.24 crore at June, 2010 PL. Tariff will be worked out after final apportioning of cost between water and power components by MoWR.
- 2.1.1.26. Generation envisaged from Kishau Project is 1851.51 MUs. In addition, there will be additional generation of 472.32 MU from existing downstream projects.
- 2.1.1.27. GoU formally allotted the Project to UJVN Limited on 06.06.2011.
- 2.1.1.28. Revised DPR with revised cost estimate based on PL June, 2010 was submitted to CWC on 15th Oct, 2010. Replies to the comments of 5 Directorates of CWC/CEA were submitted by UJVN Limited.
- 2.1.1.29. GoU decided to execute the project in JV of GoU & GoHP.
- 2.1.1.30. Principal Secretary, PM Office, convened a joint meeting of Secretary, MoWR, Secretary, MoP, Secretary, Planning Commission and Chief Secretaries of Uttarakhand & Himachal Pradesh to expedite implementation of this vital "National Project" on 13.09.14 in New Delhi. In the meeting it was agreed that 90% cost of power component shall also be funded by Govt. of India. The issue

shall be taken up with Gol on formation of Joint Venture by GoU & GoHP & registration of JV.

- 2.1.1.31. Director (IA), MoEF, Gol has been requested for issue of TOR for EIA/EMP studies of the Project on 28.04.2015 but this will be expedited after formation of the company.
- 2.1.1.32. MoU has been signed between Govt. of Himachal Pradesh and Govt. of Uttarakhand for Joint Venture formation on 20.06.2015 in presence of Hon'ble Chief Minister, Uttarakhand.
- 2.1.1.33. A meeting was held on 21.08.2015 at Shimla between MD, HPPCL and MD, UJVNL regarding finalization of modalities for formation of Joint Venture, wherein it was decided to form a company Kishau Multipurpose Project Development Corporation Limited.
- 2.1.1.34. Principal Secretary (Energy), GoU has requested Secretary, MoWR, Gol to forward proposal for approval of funding of 90% cost of Power Component also by Govt. of India.
- 2.1.1.35. Hiring of consultant services for revised DPR preparation.
- 2.1.1.36. Hydrology data is to be collected from CWC to update hydrology in DPR.
- 2.1.1.37. Report on design flood for Kishau is to be updated through IIT, Roorkee.
- 2.1.1.38. Latest data regarding design storm values is to be procured from Indian Meteorological Department.
- 2.1.1.39. Tentative dates for execution of the project are as under:

Start of major works	April, 2020
Month/Year of Commissioning	Dec, 2029

1. Memorandum of Association (MoA) and Article of Association (AoA) were approved by Government of Himachal Pradesh and Government of Uttarakhand in Jun-2016 and Aug-2016 respectively.
2. The Joint Venture Company (Special Purpose Vehicle) for execution of Kishau Multipurpose Project was incorporated on dated 16.01.2017 under the company Act 2013 having CIN U7999UR2017SGC007521 with the registered name "Kishau Corporation Limited" and H.Q. at Dakpathar, Distt. Dehradun.
3. Meeting of 1st Directors of the Kishau Corporation Limited was held on 14.02.2017 in the chamber of Chief Secretary, Uttarakhand at Dehradun.
4. As on date, the cost apportionment of Kishau MPP in similar line as of Lakhwar MPP is under active consideration by CWC.

DPR up gradation works are being taken up from the office of GM (CDH & NP) & Nodal officer, Kishau MPP, UJVNL, Dehradun.

DPR & other project related work can be expedited after signing of MoU by beneficiary states, sufficient seed money for uninterrupted work and deployment of dedicated staff for the project.

Capital Expenditure

The capital expenditure of Rs. 510 Crores is projected to be incurred during the control period. The year wise phasing of the capital expenditure during the control period is shown in the table below:

Table 15: Capital Expenditure during the Control Period – Kishau Project (Rs. in Crores)

Sr. No.	Particulars	Up to FY 2017-18 (Actual)	FY 2018-19			FY 2019-20 (Projected)	FY 2020-21 (Projected)	FY 2021-22 (Projected)
			Apr-Sep (Actual)	Oct-Mar (Estimated)	Apr-Mar (Total)			
A	Land	-	-	-	-	2.50	2.00	0.50
B	Building	-	-	-	-	2.50	10.00	5.00
C	Major Civil Works	-	-	-	-	0.50	175.00	250.00
D	Plant & Machinery	-	-	-	-	0.50	5.00	4.50
E	Vehicles	-	-	-	-	0.50	1.00	1.50
F	Furniture & Fixtures	-	-	-	-	0.25	0.50	30.00
G	Office Equipment	-	-	-	-	0.50	0.50	3.50
H	Others	0.65	-	2.00	2.00	2.75	6.00	5.00
Total		0.65	-	2.00	2.00	10.00	200.00	300.00

Financing of Capital Expenditure

The project will be financed with the Debt:Equity ratio of 70:30. Out of Capex of Rs. 510 Crores planned for the control period, debt component will be Rs. 357 Crores and equity contribution will be Rs. 153 Crores. Year-wise allocation of debt and equity for the control period is provided in the table below:

Table 16: Funding Pattern during the Control Period – Kishau Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Capital Expenditure	2.00	10.00	200.00	300.00
Debt (70%)	1.40	7.00	140.00	210.00
Equity (30%)	0.60	3.00	60.00	90.00


(Purushottam Singh)
Director (Operation)
UJVN Ltd.
Dehradun

Sirkari Bhyol Rupsiabagar Hydroelectric Project (120 MW)

Background

- 2.1.1.40. Sirkari Bhyol Rupsiabagar HEP was allotted to UJVNL by GoU on 9th Dec, 2004.
- 2.1.1.41. Sirkari Bhyol Rupsiabagar Project (4X42 MW) is a run-of-river scheme on river Gori Ganga with 1200 meter of HRT in district Pithroagarh. About 30 Km long pedestrian route is available only for approaching the project site but the road is under construction by Border Roads & is expected to be completed by the time DPR is approved from CEA.
- 2.1.1.42. Total power generation is 662.08 MU. Project cost including IDC is Rs 1233.79 crore at Feb. 2014 Price level and tariff is Rs 4.23. Construction schedule of project is 54 months.
- 2.1.1.43. Work of preparation of DPR was allotted to M/s SMEC International Pty Ltd., Gurgaon. Agreement and work is under progress as per revised scope of work assigned to the firm.
- 2.1.1.44. Due to unprecedented flood occurred in June, 2013, topographical changes at barrage site were observed. These topographical changes lead to further revision of capacity and layout as a result of which project capacity is revised to 168 MW. Layout optimization study was carried out by the consultant and same was got reviewed by UJVNL.
- 2.1.1.45. Hydrology and Power Potential report was prepared and submitted to CEA/CWC in 24/09/2013 & 30/11/2013 respectively. The hydrology chapter was resubmitted on 29/08/2014. Fresh observations have been received in December 2014. Project layout was revised and approval on FRL/TWL of project along with revised capacity of 168 MW has been accorded by GoU vide letter dated 03.12.2014.
- 2.1.1.46. Geotechnical & Geological Investigation work is in progress. Drifting / Drilling Completed – 300 m out of total 650 m / 1000 m out of 1000 m. Later, in compliance to GSI observation in meeting on 24/12/14 and First Consultation meeting on 20/07/2015, the quantity of drilling and drifting was increased. At present, 1600m additional drilling and 310m additional drifting is proposed to be carried out as per direction of GSI/CEA.
- 2.1.1.47. G&D site was washed in June, 2013 flood. Establishment of new G & D site has been completed by Dec. 2014. In view of requirement of additional site details & geographical changes, consultant has requested for re-surveying for which action is being taken.
- 2.1.1.48. First stage clearance was accorded with approval of TOR on 17/08/2009. Distance of Barrage and Powerhouse from boundary of Askot Musk Deer Park is 23.57 km & 21.68 km respectively. Some EIA/EMP studies were conducted by WAPCOS but the same could not be completed.
- 2.1.1.49. Request was submitted to MoEF for issuance of fresh ToR for conduction EIA/EMP studies afresh & to complete balance geo technical works. Presentation

was given in MoEf before EAC on 27-10-2015. The EIA/EMP studies shall be carried out as per requirement of ToR issued by MoEF.

- 2.1.1.50. Work of preparation of DPR by M/s SMEC International Pty Ltd., Gurgaon.
- 2.1.1.51. Hydrology approved by Central Water Commission on 21st Feb, 2017.
- 2.1.1.52. Power Potential with installed capacity 120 MW (3X40) approved by Central Electricity Authority on 21st July 2017.
- 2.1.1.53. General lay out has been submitted for approval.
- 2.1.1.54. Civil design report submitted in HCD Directorate, CWC for examination.
- 2.1.1.55. Site specific seismic design parameter approved in May 2018.
- 2.1.1.56. Fresh ToR issued by MoEF & CC in 2016 with validity upto 2020.
- 2.1.1.57. EIA/EMP studies in progress and 3 field season study completed.
- 2.1.1.58. After conducting Public hearing, the completed EIA/EMP study report shall be submitted to MoEF & CC for environmental clearance of project.
- 2.1.1.59. The report target for submission to MoEF & CC by end of May 2019.

Construction Schedule of the Sirkari Bhyol Rupsiabagar HEP

Award of major works	April, 2019
Month/Year of Commissioning	March, 2025

Capital Expenditure:

The cost of the project is based on Feb 2014 PL price level. The plant is under the investigative and the planning stage. It has been estimated that an amount of Rs. 175 Crores will be spent on the project during the control period. The detailed year wise phasing of the capital expenditure has been given below:

Table 17: Capital Expenditure during the Control Period – Sirkari Bhyol Rupsiabagar Project (Rs. in Crores)

Sr. No.	Particulars	Up to FY 2017-18 (Actual)	FY 2018-19			FY 2019-20 (Projected)	FY-2020-21 (Projected)	FY 2021-22 (Projected)
			Apr-Sep (Actual)	Oct-Mar (Estimated)	Apr-Mar (Total)			
A	Land	-	-	-	-	5.00	0.50	
B	Building	-	-	-	-	3.50	5.00	1.50
C	Major Civil Works	-	-	-	-	5.00	35.00	85.00
D	Plant & Machinery	-	-	-	-	7.50	5.00	2.50
E	Vehicles	-	-	-	-	0.05	2.50	0.05
F	Furniture & Fixtures	-	-	-	-	0.05	0.05	0.05
G	Office Equipment	-	-	-	-	0.15	1.00	1.50
H	Others	15.63	0.92	1.98	2.90	3.75	0.95	9.40
	Total	15.63	0.92	1.98	2.90	25.00	50.00	100.00

Financing of Capital Expenditure

The project will be financed with the Debt:Equity ratio of 70:30. Out of Capex of Rs. 175 Crores planned for the control period, debt component will be Rs. 122.50 Crores and equity contribution will be Rs. 52.50 Crores. Year-wise allocation of debt and equity for the control period is provided in the table below:

Table 18: Financing Plan of the Capital Expenditure during the control period (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Capital Expenditure	2.90	25.00	50.00	100.00
Debt (70%)	2.03	17.50	35.00	70.00
Equity (30%)	0.87	7.50	15.00	30.00


(Purushottam Singh)
Director (Operation)
UJVN Ltd.
Dehradun

Bowala Nand Prayag Hydroelectric Project (300 MW)

Background

- 2.1.1.60. Bowla Nand Prayag Project (4X75 MW) is a run-of-river scheme on river Alaknanda in district Chamoli. Bowala Nandprayag HEP was allotted to UJVNL on 1st July, 2002.
- 2.1.1.61. Total generation envisaged is 1340.06 MU. Project cost including IDC is Rs 2226.56 crore and Levelised tariff is Rs 3.41 at Feb., 2014 PL. Construction schedule of project is 60 months.
- 2.1.1.62. Clearance has been accorded by almost all the directorates of CEA/CWC & final Techno Economic Concurrence (TEC) from CEA is expected by end of Nov-2015.
- 2.1.1.63. TOR for revised project capacity of 300 MW was issued by MoEF on 09.09.2008. Report of EIA/EMP studies conducted by M/s Rites has been submitted by UJVNL to MoEF in April, 2011.
- 2.1.1.64. Public hearing has been successfully re-conducted on 18.10.2014 at Project site in the presence of ADM (Chamoli), officials of State Environment Protection & Pollution Control Board and the minutes have been forwarded by SEP & PCB on 20.11.2014 to MoEF. MoEF has been requested to issue environmental clearance for this project.
- 2.1.1.65. The Forest land case has been prepared in 07 nos. of copies as per requirement. Joint Inspection, Area demarcation and Tree counting has been completed. Total 8.604 Ha. Private land is required and Land case has been prepared & submitted to District Land Acquisition Officer.
- 2.1.1.66. The barrage of project is at 3.5 Km from the boundary of Kedarnath Wild Life Sanctuary (< 10 Km Periphery). Thus, clearance from NWLB is required for which case was submitted to Dy. C. F., Kedarnath Van Prabhag, Gopeshwar. No objection/ clearance from Wild life is awaited.
- 2.1.1.67. As per Forest Right Act 2006, NOC is required from villages of Van Panchayat i.e Bowala 9.282 Ha, Ropa 1.0 Ha., Pursari 13.667 Ha., Dusat 3.97 Ha. Efforts are in progress to get desired NoC from affected villages.
- 2.1.1.68. The approval of GoU was received in Nov-2011 to execute Bowala Nand Prayag & Nand Prayag Langasu Projects in Joint Venture through open bidding process. RFQ cum RFP document, Joint Venture Agreement & Share Holding Agreement have been finalized and submitted to GoU for approval on 18.01.2012. The same are under examination in Finance Department, GoU.
- 2.1.1.69. After discussion with Secretary (Energy), a note regarding implementation of Bowala Nand Prayag and Nand Prayag Langasu Projects through separate Joint Ventures has been forwarded to GoU on 20.12.2014.

- 2.1.1.70. EAC of MoEF & CC for river valley project has recommended for additional EIA / EMP studies in August 2016.
- 2.1.1.71. Fresh ToR has not been issued by MoEF & CC till date.
- 2.1.1.72. Forest land case has been prepared & NOC from affected village is being pursued
- 2.1.1.73. Standing committee of National Board for Wild life in its 43rd meeting held on 27 June 2017 has recommended proposal for consideration.
- 2.1.1.74. A review meeting held on 19.03.2018 in CEA, New Delhi was attended by DGM (I&P and kishau). As per discussions in the meeting and in compliance to letter no. 207/9/2015 /HPA-1/241 dated 20-03-2018.
- 2.1.1.75. The replies regarding longitudinal connectivity and effect on Power Potential due to implementation of e-Flow have been sent to CEA vide letter no. 443/UJVNL/03/D(P)/GM(CNP)/dated 06-04-2018 and subsequently vide letter no. 709/ UJVNL/ 03/Dir(P)/GM(CDH&NP)/BNP dated 25-05-2018.
- 2.1.1.76. A review meeting regarding status of BNP HEP was attended by GM (CDH&NP) and D.G.M (I&P and Kishau) on 09-07-2018 in CEA, New Delhi.
- 2.1.1.77. Effect on Power potential due to e-flow recommended by Expert Body-2 (EB 2) OF MoEF has been sent vide letter no. 1401/UJVNL/03/D(P)/GM(CDH&NP)/dated. 10-09-2018
- 2.1.1.78. Proposal of longitudinal connectivity has been sent vide letter no. 1400/UJVNL/03/D(P) /GM(CDH&NP)/dated. 10-09-2018
- 2.1.1.79. Reply to Observation on DPR regarding CSMRS has been sent vide letter no. 1422/UJVNL/03/D(P)/GM(CDH&NP)/dated. 12-09-2018.
- 2.1.1.80. The proposed construction schedule as approved by CEA is as below:

Construction Schedule of the Bowala Nand Prayag

Start of major works	Oct, 2019
Month/Year of Commissioning	Dec, 2025

Capital Expenditure:

The estimated cost of the project at May 2012 price level is Rs. 3007.24 Crores including IDC of 612.39 Crores and Rs. 290.35 Crores for Financing Charges. It has been estimated that an amount of Rs. 450 Crores will be spent on the project for the control period. The detailed year wise phasing of the capital expenditure has been given below:

Table 19: Capital Expenditure during the Control Period – Bowala Nand Prayag Project (Rs. in Crores)

Sr. No.	Particulars	Up to FY 2017-18 (Actual)	FY 2018-19			FY 2019-20 (Projected)	FY 2020-21 (Projected)	FY 2021-22 (Projected)
			Apr-Sep (Actual)	Oct-Mar (Estimated)	Apr-Mar (Total)			
A	Land	-	-	-	-	2.00	0.50	0.80
B	Building	-	-	-	-	5.00	0.50	0.10
C	Major Civil Works	-	-	-	-	75.00	134.00	180.00
D	Plant & Machinery	-	-	-	-	8.00	10.00	10.50
E	Vehicles	-	-	-	-	0.50	0.10	0.10
F	Furniture & Fixtures	-	-	-	-	0.50	0.50	0.20
G	Office Equipment	-	-	-	-	2.00	1.00	2.50
H	Others	5.53	0.06	0.41	0.47	7.00	3.40	5.80
	Total	5.53	0.06	0.41	0.47	100.00	150.00	200.00

Financing of Capital Expenditure:

The Project will be financed with the Debt:Equity ratio of 70:30. Out of Capex of Rs. 1,300 450 Crores planned during the control period, debt will be Rs. 315 Crores and equity contribution will be Rs. 135 Crores. Equity will be provided from budgetary support of GoU envisaged for UJVN Limited while debt is yet to be tied-up with financial institutions. Equity contribution will be 26% from UJVN Limited and 74% by JV partner. Free equity offered by the probable JV partner over and above 10% threshold equity to UJVN Limited will be the basis of selecting the JV partner, thus UJVN Limited will be required to invest 16% or less of the equity component in the project. The equity contribution by UJVN Limited will be considered as investment in its books of accounts. Year-wise allocation of debt and equity for the control period is provided in the table below:

Table 20: Funding Pattern during the Control Period – Bowla Nand Prayag Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Capital Expenditure	0.47	100.00	150.00	200.00
Debt (70%)	0.33	70.00	105.00	140.00
Equity (30%)	0.14	30.00	45.00	60.00

Capex at various power stations is subject to necessary approval from competent authority.


(Purushottam Singh)
Director (Operation)
UJVN Ltd.
Dehradun

Nand Prayag Langasu Hydroelectric Project (100 MW)

Background

- 2.1.1.81. Nand Prayag Langasu Project (4X25 MW) is a run-of-river scheme on river Alaknanda in district Chamoli. Nand Prayag Langasu HEP was allotted to UJVNL by GoU on 6th Oct, 2005.
- 2.1.1.82. Total power generation is 490.45 MU. Project cost including IDC is Rs 1401.4 crore and tariff is Rs 4.70 on August 2010 PL. Construction schedule of project is 66 months.
- 2.1.1.83. DPR was prepared & submitted to CEA/CWC for TEC in March 2011. Observations of CEA & different directorates were received. Necessary action is in progress.
- 2.1.1.84. GSI observation on Geology has been replied on 05/03/2013 & further Revised work Program for Balance geotechnical activities at project site has been submitted on 01/03/2014. Some geotechnical investigations are balance which can be taken up on extension of ToR by MoEF. G&D site is in running condition and regular discharge measurements are being taken.
- 2.1.1.85. Approvals on the following aspects have been received till date:
1. Hydrology (CWC) on 20/10/2010
 2. International (MOWR) on 07/06/2011
 3. Inter State (CWC) on 20/01/2012
 4. GSI on 25.11.2014
- 2.1.1.86. TOR was issued by MoEF on 21/10/2010 with a validity period of 2 years. MoEF was requested to increase the validity period of ToR of project for upto December 2016.
- 2.1.1.87. The approval for extension of validity of ToR is still awaited.
- 2.1.1.88. GOU has decided to implement the project on JV & documents related to JV formation are under examination in GoU.
- 2.1.1.89. Hydrology of the project is to be updated for which unclassified data has been received from CWC.
- 2.1.1.90. Approval for release of remaining data (classified data) has been granted by CWC in May 2018.
- 2.1.1.91. GSI observation on Geology has been replied. Some geotechnical investigations are balance which can be taken on issuance of fresh ToR by MoEF & CC.

Construction Schedule of Nand Prayag Langasu HEP

Start of major works	Oct, 2020
Month/Year of Commissioning	Dec, 2026

Capital Expenditure:

The estimated cost of the project at August 2010 price level is Rs. 1401.19 Crores including IDC & Financing Charges of 261.00 Crores. Capital expenditure of Rs. 75.40 Crores is projected to be incurred during the control period. The year wise phasing of the capital expenditure during the control period is shown in the table below:

Table 21: Capital Expenditure during the Control Period – Nand Prayag Langasu Project (Rs. in Crores)

Sr. No.	Particulars	Up to FY 2017-18 (Actual)	FY 2018-19			FY 2019-20 (Projected)	FY 2020-21 (Projected)	FY 2021-22 (Projected)
			Apr-Sep (Actual)	Oct-Mar (Estimated)	Apr-Mar (Total)			
A	Land	-	-	-	-		8.00	5.00
B	Building	-	-	-	-		5.00	5.00
C	Major Civil Works	-	-	-	-		5.00	30.00
D	Plant & Machinery	-	-	-	-		2.00	5.00
E	Vehicles	-	-	-	-		0.25	0.05
F	Furniture & Fixtures	-	-	-	-		0.10	0.05
G	Office Equipment	-	-	-	-		0.05	0.05
H	Others	4.56	0.08	0.43	0.51	0.40	4.60	4.85
	Total	4.56	0.08	0.43	0.51	0.40	25.00	50.00

Financing of Capital Expenditure:

The Project will be financed with the Debt:Equity ratio of 70:30. Out of Capex of Rs. 75.40 Crores planned during the control period, debt will be Rs. 245.28 Crores and equity contribution will be Rs. 52.78 Crores. Equity will be provided from budgetary support of GoU envisaged for UJVN Limited while debt is yet to be tied-up with financial institutions. Equity contribution will be 26% from UJVN Limited and 74% by JV partner. Free equity offered by the probable JV partner over and above 10% threshold equity to UJVN Limited will be the basis of selecting the JV partner, thus UJVN Limited will be required to invest 16% or less of the equity component in the project. The equity contribution by UJVN Limited will be considered as investment in its books of accounts. Year-wise allocation of debt and equity for the control period is provided in the table below:

Table 22: Funding Pattern during the Control Period – Nand Prayag Langasu Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Capital Expenditure	0.51	0.40	25.00	50.00
Debt (70%)	0.36	0.28	17.50	35.00
Equity (30%)	0.15	0.12	7.50	15.00

Tamak Lata Hydroelectric Project (190 MW)

Background

- 2.1.1.92. Tamak Lata Project (4X47.5 MW) is a run-of-river scheme on river Dhauli Ganga in district Chamoli and situated in tribal areas. Tamak Lata HEP was allotted by GoU to UJVNL on 6th Oct, 2005.
- 2.1.1.93. Total power generation is 1041.13 MU. Project cost including IDC is Rs 1052.99 crore at Nov-2007 PL. Construction schedule of project is 42 months.
- 2.1.1.94. Hydrology and Power Potential Chapters were submitted to CEA in July,2007. Revised Power Potential chapter shall be resubmitted after finalization of new project layout. Hydrology of the project has been approved in 18/10/2011.
- 2.1.1.95. MoEF raised observations on project layout and directed to leave free riverine stretch as per MoEF guidelines. In compliance project layout was modified and Power House was shifted approximately 2.5 Km u/s from original location. MoEF has approved the location of Dam & Power House of the project with reduced capacity of 190 MW.
- 2.1.1.96. G&D site is in running condition and regular measurements are being taken.
- 2.1.1.97. Geotechnical & Geological investigation works has been completed at new Barrage location. The drawing with locations of Bore holes to be drilled at New Power House has been provided. The Drilling work shall commence after clearance from Supreme Court.
- 2.1.1.98. First stage clearance accorded with approval of TOR on 08/11/2005 which has been expired in 2007.
- 2.1.1.99. Combined Power Potential Studies was carried out by M/s THDC for Malari Jhelam, Jhelam Tamak & Tamak Lata & same was presented before EAC (MoEF) 57th meeting held on 27/04/2012, wherein, Approval has been granted by MoEF. Therefore, Tamak Barrage is at its original location, however, powerhouse is shifted to 2.5 km upstream to ensure free riverine stretch as per MoEF observation.
- 2.1.1.100. Reply to the observations of Expert Appraisal Committee for providing ToR for conducting EIA/EMP studies have been framed and same has been submitted on 16.03.2013 & 08.07.2013.
- 2.1.1.101. The approval of GoU was received in Nov-2011 to execute Tamak Lata Project in Joint Venture through open bidding process. RFQ cum RFP document, Joint Venture Agreement & Share Holding Agreement was finalized and submitted to GoU for approval in Feb-2012. The same are under examination in Finance Department, GoU.
- 2.1.1.102. Project is included in WII list of 24 projects, for which PIL is being reviewed by Hon'ble Supreme Court. Any action on this project can be taken only after decision of Hon'ble Court.

Capital Expenditure:

The estimated cost of the project at November 2007 price level is Rs. 1053.45 Crores excluding IDC & Financing Charges. Capital expenditure of Rs. 53.95 Crores is projected to be incurred during the control period. The year wise phasing of the capital expenditure during the control period is shown in the table below:

Table 23: Capital Expenditure during the Control Period – Tamak Lata Project (Rs. in Crores)

Sr. No.	Particulars	Up to FY 2017-18 (Actual)	FY 2018-19			FY 2019-20 (Projected)	FY 2020-21 (Projected)	FY 2021-22 (Projected)
			Apr-Sep (Actual)	Oct-Mar (Estimated)	Apr-Mar (Total)			
A	Land	-	-	-	-	-	-	20.00
B	Building	-	-	-	-	-	-	5.00
C	Major Civil Works	-	-	-	-	-	-	10.00
D	Plant & Machinery	-	-	-	-	-	-	8.00
E	Vehicles	-	-	-	-	-	-	0.50
F	Furniture & Fixtures	-	-	-	-	-	-	0.05
G	Office Equipment	-	-	-	-	-	-	0.50
H	Others	4.40	-	0.35	0.35	1.95	2.00	5.95
Total		4.40	-	0.35	0.35	1.95	2.00	50.00

Financing of Capital Expenditure:

The Project will be financed with the Debt: Equity ratio of 70:30. Out of Capex of Rs. 53.95 Crores planned during the control period, debt will be Rs. 37.77 Crores and equity contribution will be Rs. 16.19 Crores. Equity will be provided from the budgetary support of GoU envisaged for UJVN Limited while debt is yet to be tied-up with financial institutions. Equity contribution will be 26% from UJVN Limited and 74% by JV partner. Free equity offered by the probable JV partner over and above 10% threshold equity to UJVN Limited will be the basis of selecting the JV partner, thus UJVN Limited will be required to invest 16% or less of the equity component in the project. The equity contribution by UJVN Limited will be considered as investment in its books of accounts. Year-wise allocation of debt and equity for the control period is provided in the table below:

Table 24: Funding Pattern during the Control Period – Tamak Lata Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Capital Expenditure	0.35	1.95	2.00	50.00
Debt (70%)	0.25	1.37	1.40	35.00
Equity (30%)	0.11	0.59	0.60	15.00

Sela Urthing Hydro Electric Project (2X115 MW)

Background

- 2.1.1.103. Sela Urthing Project (2X115 MW) is a run-of-river scheme on river Dhauli Ganga in district Pithoragarh. Sela Urthing HEP was allotted to UJVNL by GoU on 9 Dec, 2004.
- 2.1.1.104. As per PFR Total power generation is 816.73 MU. Project cost including IDC is Rs 696.73 crores and Tariff is Rs 1.22 at June, 2003 PL.
- 2.1.1.105. Order for carrying out EIA/EMP study was awarded to WAPCOS in Oct-2005.
- 2.1.1.106. Project falls within 10 Km buffer zone of Askot Musk Deer Park. For Stage-I clearance from MoEF, Clearance for carrying out survey work was accorded by state wild life board but National Wild Life Board (MOEF) has refused permission in Oct. 2010.
- 2.1.1.107. Case for re-consideration for according approval for carrying out survey & investigation has been submitted to DFO, Pithoragarh in June – 2012, forwarded to Conservator Forest, Almora by DFO in Oct - 2012. Conservator Forest, Almora Forwarded to Principal Conservator of Forest (Wild Life), Dehradun in Feb-2013.
- 2.1.1.108. Principal Conservator of Forest (Wild Life) was requested to take action on the recommended proposal submitted by CF, Almora, vide UJVNL letter dated: 10/09/2013, and dated: 11/09/2014.
- 2.1.1.109. The proposal has been recommended by the State Wild Life Board to submit the proposal to National wild life Board in its meeting dated 15-04-2015. Principal Secretary, Forest, GoU vide letter dated 10-08-2015 has requested for proposal in five sets, the same shall be submitted at the earliest.
- 2.1.1.110. First stage clearance accorded and TOR issued by MoEF & CC on dated 05/05/2016. Local site survey also been completed in March 2018.
- 2.1.1.111. Precise and control survey of the project area has been carried out by Survey of India, completed in July-2017.
- 2.1.1.112. Detailed contour survey has also been completed in March 2018 on the basis of control points established by soi, Dehradun. Contour sheet finalized in June 2018.
- 2.1.1.113. G&D site established by end of April 2017 and data collection in progress from 01 May 2017.
- 2.1.1.114. Initiation for collection of hydrological data from Central Water Commission, Lucknow required for preparation of hydrology chapter of DPR. Request submitted vide letter no 843/UJVNL/03/Dir (P)/GM(C-NP)/SU dated 20.06.2017 for issuance hydrology data required for DPR preparation and matter is being pursued.
- 2.1.1.115. Hydrology chapter shall be taken up after getting data from CWC.
- 2.1.1.116. Consultancy services will be required for preparation of DPR for which bidding process is in progress.

Capital Expenditure:

The estimated cost of the project at June 2003 PL price. Capital expenditure of Rs. 7.23 Crores is projected to be incurred during the control period. The year wise phasing of the capital expenditure during the control period is shown in the table below:

Table 25: Capital Expenditure during the Control Period – Sela Urthing HEP (Rs. in Crores)

Sr. No.	Particulars	Up to FY 2017-18 (Actual)	FY 2018-19			FY 2019-20 (Projected)	FY 2020-21 (Projected)	FY 2021-22 (Projected)
			Apr-Sep (Actual)	Oct-Mar (Estimated)	Apr-Mar (Total)			
A	Land	-	-	-	-	-	-	-
B	Building	-	-	-	-	-	-	-
C	Major Civil Works	-	-	-	-	-	-	-
D	Plant & Machinery	-	-	-	-	-	-	-
E	Vehicles	-	-	-	-	0.10	-	-
F	Furniture & Fixtures	-	-	-	-	-	-	-
G	Office Equipment	-	-	-	-	-	-	-
H	Others	1.52	0.23	0.21	0.44	3.20	1.43	2.50
	Total	1.52	0.23	0.21	0.44	3.30	1.43	2.50

Financing of Capital Expenditure:

The Project will be financed with the Debt: Equity ratio of 70:30. Out of Capex of Rs. 7.23 Crores planned during the control period, debt will be Rs. 5.06 Crores and equity contribution will be Rs. 2.17 Crores. Equity will be provided from the budgetary support of GoU envisaged for UJVN Limited while debt is yet to be tied-up with financial institutions. The equity contribution by UJVN Limited will be considered as investment in its books of accounts. Year-wise allocation of debt and equity for the control period is provided in the table below:

Table 26: Funding Pattern during the Control Period – Sela Urthing HEP (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Capital Expenditure	0.44	3.30	1.43	2.50
Debt (70%)	0.31	2.31	1.00	1.75
Equity (30%)	0.13	0.99	0.43	0.75


 (Purushottam Singh)
 Director (Operation)
 UJVN Ltd.
 Dehradun

Upcoming SHPs

There are many SHPs that are under various stages of the construction with the petitioner.

Table 27: Capital Expenditure during the control period on the upcoming SHPs (Rs. in Crores)

Sr. No.	Name of the Project	FY 2018-19 Apr - Sept (Actual)	FY 2018-19 Oct - March (Projected)	FY 2018-19 (Total) (Estimated)	FY 2019-20 (Projected)	FY 2020-21 (Projected)	FY 2021-22 (Projected)
1	Kaliganga-I	2.59	8.17	10.96	13.45	5.52	-
2	Kaliganga-II	4.60	8.69	13.29	17.06	5.45	-
3	Suringad-II	2.15	4.00	6.15	14.12	2.50	-
4	Madhmaheshwar	23.32	30.74	54.06	57.49	19.63	-
5	Kulagad	-	-	-	1.05	6.05	7.05
6	Guptkashi	-	-	-	0.25	5.25	11.40
7	Purkul	-	-	-	0.25	3.88	9.72
8	Tankul SHP	-	-	-	3.70	27.00	66.00
9	Kanchauti SHP	-	-	-	0.05	0.05	0.05
10	Painagad SHP	-	-	-	0.10	2.10	2.10
11	Jimbagad SHP	-	0.10	0.10	1.10	2.10	7.10
12	Bhilangana II - A	0.50	1.37	1.87	5.80	61.95	127.00
13	Bhilangana II - B	-	1.00	1.00	1.00	3.00	7.00
14	Bhilangana II - C (Pokhar)	-	-	-	-	-	-
15	Tapovan	-	-	-	-	-	-
16	Pilangad II	3.03	3.74	6.77	-	-	-
17	Urgam II	-	-	-	-	-	-
	Total	36.18	57.81	94.19	115.42	144.48	237.42

*Capex at various power stations is subject to necessary approval from competent authority.

The details of the capital Expenditure have been attached in the Annexure – 1 (A) to 1 (Q).


(Purushottam Singh)
 Director (Operation)
 UJVN Ltd.
 Dehradun

3. CAPITAL EXPENDITURE PLAN – EXISTING PROJECTS

Chibro Power Station (240 MW)

Background

- 3.1.1.1. Chibro Power Station is a Run-of-River scheme with an underground Power Station. It was the first underground Power Station in the North India and was commissioned in the year 1975. The Power Station draws water from Ichari dam located on the river Tons, one of the major tributaries of river Yamuna.
- 3.1.1.2. Chibro Power Station is a unique engineering marvel in the country and was the first experience in carrying out tunneling in the Himalayan Thrust Zones, which was a challenge due to varied rock structure and strength. There were unexpected challenges in the tunneling effort. The water from Ichari Dam is fed into the Power Station through a 6.2 km long Head Race Tunnel (HRT). The Power Station comprising of 4 units of 60 MW each with Francis turbines of 62.66 MW output, is housed in a rock cavern with the major challenge of maintaining fresh air and safety measures due to constraint of space. Design head of the project is 110m.

Capital Expenditure

- 3.1.1.3. Expenditure for capital nature major maintenance & other works for the control period is projected at Rs. 54.79 Crores. The work wise details of capital nature major maintenance & other expenses are provided as **Annexure - 2**. The expenditures of the head office have been apportioned among the various 10 LHPs based on the capacity of the LHPs. 85% of the expenses is apportioned to existing 9 LHPs except MB-II, 10% is apportioned to MB-II & 5% is apportioned to SHPs. The apportionment sheet has been attached in the form of **Annexure - 12**. The year wise phasing of the capital expenditure during the control period is shown in the table below:

Table 28: Capital Expenditure for Major Maintenance & Other Works – Chibro Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Land	-	-	-	-
Building	11.17	7.07	9.74	6.89
Major Civil Works	1.24	1.62	1.65	-
Plant & Machinery	11.43	24.30	2.33	1.00
Vehicles	0.00	-	-	-
Furniture & Fixtures	0.01	-	-	-
Office Equipments & Others	4.42	0.18	-	-
Total	28.27	33.17	13.72	7.89

- 3.1.1.4. Expenditure for capital nature works regarding DRIP for the control period is projected at Rs. 13.81 Crores. The expenditures all DRIPs have been submitted in

separate chapter provided subsequently. The work wise details of DRIP expenses are provided as **Annexure – 13 (B)**. The year wise phasing of the capital expenditure during the control period is shown in the table below:

Table 29: Capital Expenditure for DRIP Works – Chibro Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Land	-	-	-	-
Building	-	-	-	-
Major Civil Works	6.33	8.81	0.97	-
Plant & Machinery	0.33	2.70	1.33	-
Vehicles	-	-	-	-
Furniture & Fixtures	0.13	-	-	-
Office Equipments & Others	0.05	-	-	-
Total	6.84	11.51	2.31	-

3.1.1.5. Total Capital Expenditure including DRIP for the control period is projected at Rs. 68.60 Crores. The year wise phasing of the capital expenditure during the control period is shown in the table below:

Table 30: Total Capital Expenditure for the control period – Chibro Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Land	-	-	-	-
Building	11.17	7.07	9.74	6.89
Major Civil Works	7.56	10.43	2.62	-
Plant & Machinery	11.77	27.00	3.67	1.00
Vehicles	0.00	-	-	-
Furniture & Fixtures	0.14	-	-	-
Office Equipments & Others	4.47	0.18	-	-
Total	35.11	44.68	16.03	7.89

Financing of Capital Expenditure:

3.1.1.6. The Project will be financed through a Debt: Equity ratio of 70:30. Out of Capex of Rs. 68.60 Crores planned during the control period, debt will be Rs. 48.02 Crores and equity contribution will be Rs. 20.58 Crores. Equity will be provided from budgetary support of GoU envisaged for UJVN Limited while debt will be provided by financial institutions like PFC, REC, NABARD, IREDA etc. Year-wise allocation of debt and equity for the control period is provided in the table below:


(Purushottam Singh)
 Director (Operation)
 UJVN Ltd.
 Dehradun

Table 31: Funding Pattern during the Control Period – Chibro Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Capital Expenditure	35.11	44.68	16.03	7.89
Debt (70%)	24.58	31.28	11.22	5.52
Equity (30%)	10.53	13.40	4.81	2.37

Capitalization Schedule:

3.1.1.7. Total capital expenditure of Rs. 68.60 Crores will get capitalized during the control period. The year wise capitalization has been done to avoid the tariff shocks.

Year-wise capitalization during the control period is provided in the table below:

Table 32: Capitalization during the Control Period – Chibro Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Land	-	-	-	-
Building	11.17	7.07	9.74	6.89
Major Civil Works	7.56	10.43	2.62	-
Plant & Machinery	11.77	27.00	3.67	1.00
Vehicles	0.00	-	-	-
Furniture & Fixtures	0.14	-	-	-
Office Equipments & Others	4.47	0.18	-	-
Total	35.11	44.68	16.03	7.89


(Purushottam Singh)
Director (Operation)
UJVN Ltd.
Dehradun

Khodri Power Station (120 MW)

Background

- 3.1.1.8. The Power Station is located downstream of the Chibro Power Station and was commissioned in the year 1984. The Power Station draws water through a tunnel 5.6 km long and 7.5 m in diameter, directly from the collection gallery of the Chibro Power Station. The surface Power Station comprising 4 units of 30 MW each with Francis Turbines of 43,600 HP output is located on the banks of Yamuna. The outlet of the water from the Power Station is in river Yamuna, upstream of the Dakpathar Barrage. Design head of the Power Station is 57.9 m.
- 3.1.1.9. The operation of Chibro Power Station and the Khodri Power Station is another engineering marvel. The tandem control scheme between Chibro and Khodri Power Stations is in operation since January, 1984 and is the first of its kind in the country which optimizes the utilization of water for generation besides maintaining the safety of both the stations in case of outages.

Capital Expenditure

- 3.1.1.10. Expenditure for capital nature major maintenance & other works for the control period is projected at Rs. 19.10 Crores. The work wise details of capital nature major maintenance & other expenses are provided as **Annexure - 3**. The expenditures of the head office have been apportioned among the various 10 LHPs based on the capacity of the LHPs. 85% of the expenses is apportioned to existing 9 LHPs except MB-II, 10% is apportioned to MB-II & 5% is apportioned to SHPs. The apportionment sheet has been attached in the form of **Annexure - 12**. The year wise phasing of the capital expenditure during the control period is shown in the table below:

Table 33: Capital Expenditure for Major Maintenance & Other Works – Khodri Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Land	-	-	-	-
Building	5.12	1.76	4.74	2.76
Major Civil Works	0.12	-	-	-
Plant & Machinery	29.88	8.50	1.17	-
Vehicles	0.00	-	-	-
Furniture & Fixtures	0.00	0.09	-	-
Office Equipments & Others	2.20	0.09	-	-
Total	37.31	10.44	5.91	2.76

- 3.1.1.11. Expenditure for capital nature works regarding DRIP for the control period is projected at Rs. 6.91 Crores. The expenditures all DRIPs have been submitted in separate chapter provided subsequently. The work wise details of DRIP expenses are provided as **Annexure – 13 (B)**. The year wise phasing of the capital expenditure during the control period is shown in the table below:

Table 34: Capital Expenditure for DRIP Works – Khodri Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Land	-	-	-	-
Building	-	-	-	-
Major Civil Works	3.16	4.40	0.49	-
Plant & Machinery	0.17	1.35	0.67	-
Vehicles	-	-	-	-
Furniture & Fixtures	0.07	-	-	-
Office Equipments & Others	0.02	-	-	-
Total	3.42	5.75	1.15	-

3.1.1.12. Total Capital Expenditure including DRIP for the control period is projected at Rs. 26.01 Crores. The year wise phasing of the capital expenditure during the control period is shown in the table below:

Table 35: Total Capital Expenditure for the control period – Khodri Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Land	-	-	-	-
Building	5.12	1.76	4.74	2.76
Major Civil Works	3.28	4.40	0.49	-
Plant & Machinery	30.04	9.85	1.83	-
Vehicles	0.00	-	-	-
Furniture & Fixtures	0.07	0.09	-	-
Office Equipments & Others	2.22	0.09	-	-
Total	40.73	16.19	7.06	2.76

Financing of Capital Expenditure:

3.1.1.13. The Project will be financed through a Debt: Equity ratio of 70:30. Out of Capex of Rs. 26.01 Crores planned during the control period, debt will be Rs. 18.20 Crores and equity contribution will be Rs. 7.80 Crores. Equity will be provided from budgetary support of GoU envisaged for UJVN Limited while debt will be provided by financial institutions like PFC, REC, NABARD, IREDA etc. Year-wise allocation of debt and equity for the control period is provided in the table below:

Table 36: Funding Pattern during the Control Period – Khodri Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Capital Expenditure	40.73	16.19	7.06	2.76
Debt (70%)	28.51	11.33	4.94	1.93
Equity (30%)	12.22	4.86	2.12	0.83

Capitalization Schedule:

3.1.1.14. Total capital expenditure of Rs. 26.01 Crores will get capitalized during the control period. The year wise capitalization has been done to avoid the tariff shocks. Year-wise capitalization during the control period is provided in the table below:

Table 37: Capitalization during the Control Period – Khodri Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Land	-	-	-	-
Building	5.12	1.76	4.74	2.76
Major Civil Works	3.28	4.40	0.49	-
Plant & Machinery	30.04	9.85	1.83	-
Vehicles	0.00	-	-	-
Furniture & Fixtures	0.07	0.09	-	-
Office Equipments & Others	2.22	0.09	-	-
Total	40.73	16.19	7.06	2.76


(Purushottam Singh)
 Director (Operation)
 UJVN Ltd.
 Dehradun

Dhakrani Power Station (33.75 MW)

Background

- 3.1.1.15. The Power Station is located on the downstream of the Dakpathar Barrage at a distance of 8 km on the Power Channel which takes off from the Barrage. The Power Station was commissioned in the year 1965.
- 3.1.1.16. The surface Power Station comprises of 3 units of 11.25 MW each with Kaplan Turbines of 14300 HP output. Water from Dhakrani Power Station feeds Dhalipur Power Station on its downstream side through the same Power Channel. Design head of the Power Station is 19.8 m.

Capital Expenditure

- 3.1.1.17. Expenditure for capital nature major maintenance & other works for the control period is projected at Rs. 23.41 Crores. The work wise details of capital nature major maintenance & other expenses are provided as **Annexure - 4**. The expenditures of the head office have been apportioned among the various 10 LHPs based on the capacity of the LHPs. 85% of the expenses is apportioned to existing 9 LHPs except MB-II, 10% is apportioned to MB-II & 5% is apportioned to SHPs. The apportionment sheet has been attached in the form of **Annexure - 12**. The year wise phasing of the capital expenditure during the control period is shown in the table below:

Table 38: Capital Expenditure for Major Maintenance & Other Works – Dhakrani Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Land	-	-	-	-
Building	0.57	4.76	2.09	0.46
Major Civil Works	0.32	6.70	3.80	-
Plant & Machinery	3.34	3.36	2.17	-
Vehicles	0.00	0.06	-	-
Furniture & Fixtures	0.05	-	-	-
Office Equipments & Others	1.29	0.03	-	-
Total	5.57	14.90	8.05	0.46

- 3.1.1.18. Expenditure for capital nature works regarding RMU for the control period is projected at Rs. 64.80 Crores. The work wise details of RMU expenses are provided as **Annexure - 4**. The year wise phasing of the capital expenditure during the control period is shown in the table below:


 (Purushottam Singh)
 Director (Operation)
 UJVN Ltd.
 Dehradun

Table 39: Capital Expenditure for RMU Works – Dhakrani Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Land	-	-	-	-
Building	-	-	-	-
Major Civil Works	-	-	-	-
Plant & Machinery	-	24.00	20.40	20.40
Vehicles	-	-	-	-
Furniture & Fixtures	-	-	-	-
Office Equipments & Others	-	-	-	-
Total	-	24.00	20.40	20.40

3.1.1.19. Expenditure for capital nature works regarding DRIP for the control period is projected at Rs. 2.49 Crores. The expenditures all DRIPs have been submitted in separate chapter provided subsequently. The work wise details of DRIP expenses are provided as **Annexure – 13 (D)**. The year wise phasing of the capital expenditure during the control period is shown in the table below:

Table 40: Capital Expenditure for DRIP Works – Dhakrani Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Land	-	-	-	-
Building	-	-	-	-
Major Civil Works	1.91	2.49	-	-
Plant & Machinery	1.78	-	-	-
Vehicles	-	-	-	-
Furniture & Fixtures	-	-	-	-
Office Equipments & Others	0.03	-	-	-
Total	3.72	2.49	-	-

3.1.1.20. Total Capital Expenditure including RMU & DRIP for the control period is projected at Rs. 90.70 Crores. The year wise phasing of the capital expenditure during the control period is shown in the table below:

Table 41: Total Capital Expenditure for the control period – Dhakrani Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Land	-	-	-	-
Building	0.57	4.76	2.09	0.46
Major Civil Works	2.23	9.19	3.80	-
Plant & Machinery	5.12	27.36	22.57	20.40
Vehicles	0.00	0.06	-	-
Furniture & Fixtures	0.05	-	-	-
Office Equipments & Others	1.32	0.03	-	-
Total	9.29	41.39	28.45	20.86

Financing of Capital Expenditure:

3.1.1.21. The Project will be financed through a Debt: Equity ratio of 70:30. Out of Capex of Rs. 90.70 Crores planned during the control period, debt will be Rs. 63.49 Crores and equity contribution will be Rs. 27.21 Crores. Equity will be provided from budgetary support of GoU envisaged for UJVN Limited while debt will be provided by financial institutions like PFC, REC, NABARD, IREDA etc. Year-wise allocation of debt and equity for the control period is provided in the table below:

Table 42: Funding Pattern during the Control Period – Dhakrani Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Capital Expenditure	9.29	41.39	28.45	20.86
Debt (70%)	6.50	28.97	19.92	14.60
Equity (30%)	2.79	12.42	8.54	6.26

Capitalization Schedule:

3.1.1.22. Total capital expenditure of Rs. 90.70 Crores will get capitalized during the control period. The year wise capitalization has been done to avoid the tariff shocks. Year-wise capitalization during the control period is provided in the table below:

Table 43: Capitalization during the Control Period – Dhakrani Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Land	-	-	-	-
Building	0.57	4.76	2.09	0.46
Major Civil Works	2.23	9.19	3.80	-
Plant & Machinery	5.12	27.36	22.57	20.40
Vehicles	0.00	0.06	-	-
Furniture & Fixtures	0.05	-	-	-
Office Equipments & Others	1.32	0.03	-	-
Total	9.29	41.39	28.45	20.86


 (Purushottam Singh)
 Director (Operation)
 UJVN Ltd.
 Dehradun

Dhalipur Power Station (51 MW)

Background

- 3.1.1.23. The Power Station is located on the downstream of the Dhakrani Power Station at a distance of 4 km on the Power Channel which takes off from the Dakpathar Barrage. The Power Station was commissioned in the year 1965.
- 3.1.1.24. The surface Power Station comprises 3 units of 17 MW each with Francis Turbine of 24,000 HP output. The water from the Tail Race of the Power Station joins Asan River at Asan Barrage. Design head of the Power Station is 30.48 m.

Capital Expenditure

- 3.1.1.25. Expenditure for capital nature major maintenance & other works for the control period is projected at Rs. 31.08 Crores. The work wise details of capital nature major maintenance & other expenses are provided as **Annexure - 5**. The expenditures of the head office have been apportioned among the various 10 LHPs based on the capacity of the LHPs. 85% of the expenses is apportioned to existing 9 LHPs except MB-II, 10% is apportioned to MB-II & 5% is apportioned to SHPs. The apportionment sheet has been attached in the form of **Annexure - 12**. The year wise phasing of the capital expenditure during the control period is shown in the table below:

Table 44: Capital Expenditure for Major Maintenance & Other Works – Dhalipur Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Land	-	-	-	-
Building	1.11	6.06	6.16	0.70
Major Civil Works	1.42	7.35	8.00	-
Plant & Machinery	0.36	0.99	1.68	-
Vehicles	0.00	0.09	-	-
Furniture & Fixtures	0.07	-	-	-
Office Equipments & Others	0.96	0.04	-	-
Total	3.93	14.53	15.85	0.70

- 3.1.1.26. Expenditure for capital nature works regarding RMU for the control period is projected at Rs. 73.73 Crores. The work wise details of RMU expenses are provided as **Annexure - 5**. The year wise phasing of the capital expenditure during the control period is shown in the table below:


 (Purushottam Singh)
 Director (Operation)
 UJVN Ltd.
 Dehradun

Table 45: Capital Expenditure for RMU Works – Dhalipur Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Land	-	-	-	-
Building	-	-	-	-
Major Civil Works	-	-	-	-
Plant & Machinery	10.04	35.90	35.90	1.93
Vehicles	-	-	-	-
Furniture & Fixtures	-	-	-	-
Office Equipments & Others	-	-	-	-
Total	10.04	35.90	35.90	1.93

3.1.1.27. Expenditure for capital nature works regarding DRIP for the control period is projected at Rs. 3.76 Crores. The expenditures all DRIPs have been submitted in separate chapter provided subsequently. The work wise details of DRIP expenses are provided as **Annexure – 13 (D)**. The year wise phasing of the capital expenditure during the control period is shown in the table below:

Table 46: Capital Expenditure for DRIP Works – Dhalipur Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Land	-	-	-	-
Building	-	-	-	-
Major Civil Works	2.89	3.76	-	-
Plant & Machinery	2.70	-	-	-
Vehicles	-	-	-	-
Furniture & Fixtures	-	-	-	-
Office Equipments & Others	0.04	-	-	-
Total	5.63	3.76	-	-

3.1.1.28. Total Capital Expenditure including RMU & DRIP for the control period is projected at Rs. 108.57 Crores. The year wise phasing of the capital expenditure during the control period is shown in the table below:

Table 47: Total Capital Expenditure for the control period – Dhalipur Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Land	-	-	-	-
Building	1.11	6.06	6.16	0.70
Major Civil Works	4.31	11.11	8.00	-
Plant & Machinery	13.10	36.89	37.58	1.93
Vehicles	0.00	0.09	-	-
Furniture & Fixtures	0.07	-	-	-
Office Equipments & Others	1.00	0.04	-	-
Total	19.59	54.19	51.75	2.63

Financing of Capital Expenditure:

3.1.1.29. The Project will be financed through a Debt: Equity ratio of 70:30. Out of Capex of Rs. 108.57 Crores planned during the control period, debt will be Rs. 76.00 Crores and equity contribution will be Rs. 32.57 Crores. Equity will be provided from budgetary support of GoU envisaged for UJVN Limited while debt will be provided by financial institutions like PFC, REC, NABARD, IREDA etc. Year-wise allocation of debt and equity for the control period is provided in the table below:

Table 48: Funding Pattern during the Control Period – Dhalipur Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Capital Expenditure	19.59	54.19	51.75	2.63
Debt (70%)	13.72	37.93	36.22	1.84
Equity (30%)	5.88	16.26	15.52	0.79

Capitalization Schedule:

3.1.1.30. Total capital expenditure of Rs. 108.57 Crores will get capitalized during the control period. The year wise capitalization has been done to avoid the tariff shocks. Year-wise capitalization during the control period is provided in the table below:

Table 49: Capitalization during the Control Period – Dhalipur Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Land	-	-	-	-
Building	1.11	6.06	6.16	0.70
Major Civil Works	4.31	11.11	8.00	-
Plant & Machinery	13.10	36.89	37.58	1.93
Vehicles	0.00	0.09	-	-
Furniture & Fixtures	0.07	-	-	-
Office Equipments & Others	1.00	0.04	-	-
Total	19.59	54.19	51.75	2.63


 (Purushottam Singh)
 Director (Operation)
 UJVN Ltd.
 Dehradun

Kulhal Power Station (30 MW)

Background

- 3.1.1.31. The Power Station is located on the downstream of the Asan Barrage at a distance of 4.5 km on the Power Channel which takes off from the Asan Barrage. The Power Station was commissioned in the year 1975.
- 3.1.1.32. The surface Power Station comprising three units of 10 MW each with Kaplan turbine is located on the Power Channel. The water from the tail race flows towards Khara Power Station in UP. Design Head of the Power Station is 18 m.

Capital Expenditure

- 3.1.1.33. Expenditure for capital nature major maintenance & other works for the control period is projected at Rs. 37.86 Crores. The work wise details of capital nature major maintenance & other expenses are provided as **Annexure - 6**. The expenditures of the head office have been apportioned among the various 10 LHPs based on the capacity of the LHPs. 85% of the expenses is apportioned to existing 9 LHPs except MB-II, 10% is apportioned to MB-II & 5% is apportioned to SHPs. The apportionment sheet has been attached in the form of **Annexure - 12**. The year wise phasing of the capital expenditure during the control period is shown in the table below:

Table 50: Capital Expenditure for Major Maintenance & Other Works – Kulhal Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Land	-	-	-	-
Building	0.51	5.34	0.74	0.41
Major Civil Works	0.66	7.28	1.60	-
Plant & Machinery	2.40	15.46	3.50	3.50
Vehicles	0.00	-	-	-
Furniture & Fixtures	0.00	-	-	-
Office Equipments & Others	0.55	0.02	-	-
Total	4.12	28.11	5.84	3.91

- 3.1.1.34. Expenditure for capital nature works regarding DRIP for the control period is projected at Rs. 32.99 Crores. The expenditures all DRIPs have been submitted in separate chapter provided subsequently. The work wise details of DRIP expenses are provided as **Annexure – 13 (A)**. The year wise phasing of the capital expenditure during the control period is shown in the table below:

Table 51: Capital Expenditure for DRIP Works – Kulhal Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Land	-	-	-	-
Building	0.50	3.47	-	-
Major Civil Works	1.91	7.00	6.00	-
Plant & Machinery	2.44	13.05	1.02	1.95
Vehicles	-	0.40	0.10	-
Furniture & Fixtures	0.25	-	-	-
Office Equipments & Others	0.17	-	-	-
Total	5.27	23.92	7.12	1.95

3.1.1.35. Total Capital Expenditure including DRIP for the control period is projected at Rs. 70.85 Crores. The year wise phasing of the capital expenditure during the control period is shown in the table below:

Table 52: Total Capital Expenditure for the control period – Kulhal Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Land	-	-	-	-
Building	1.01	8.81	0.74	0.41
Major Civil Works	2.57	14.28	7.60	-
Plant & Machinery	4.84	28.51	4.52	5.45
Vehicles	0.00	0.40	0.10	-
Furniture & Fixtures	0.25	-	-	-
Office Equipments & Others	0.72	0.02	-	-
Total	9.39	52.03	12.96	5.86

Financing of Capital Expenditure:

3.1.1.36. The Project will be financed through a Debt: Equity ratio of 70:30. Out of Capex of Rs. 70.85 Crores planned during the control period, debt will be Rs. 49.59 Crores and equity contribution will be Rs. 21.25 Crores. Equity will be provided from budgetary support of GoU envisaged for UJVN Limited while debt will be provided by financial institutions like PFC, REC, NABARD, IREDA etc. Year-wise allocation of debt and equity for the control period is provided in the table below:

Table 53: Funding Pattern during the Control Period – Kulhal Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Capital Expenditure	9.39	52.03	12.96	5.86
Debt (70%)	6.58	36.42	9.07	4.10
Equity (30%)	2.82	15.61	3.89	1.76


(Purushottam Singh)
Director (Operation)
UJVN Ltd.
Dehradun

Capitalization Schedule:

3.1.1.37. Total capital expenditure of Rs. 70.85 Crores will get capitalized during the control period. The year wise capitalization has been done to avoid the tariff shocks. Year-wise capitalization during the control period is provided in the table below:

Table 54: Capitalization during the Control Period – Kulhal Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Land	-	-	-	-
Building	1.01	8.81	0.74	0.41
Major Civil Works	2.57	14.28	7.60	-
Plant & Machinery	4.84	28.51	4.52	5.45
Vehicles	0.00	0.40	0.10	-
Furniture & Fixtures	0.25	-	-	-
Office Equipments & Others	0.72	0.02	-	-
Total	9.39	52.03	12.96	5.86


(Purushottam Singh)
 Director (Operation)
 UJVN Ltd.
 Dehradun

Tiloth Power Station (90 MW)

Background:

- 3.1.1.38. Maneri Bhali Stage-I Project harnesses power potential of river 'Bhagirathi' between Maneri and Tiloth in district Uttarkashi for generation of electrical power. The Power Station was commissioned in the year 1984.
- 3.1.1.39. The Power Station consists of three generating units of 30 MW. Each Unit has vertical shaft, suspension type Hydro-Generator coupled to Francis type hydro turbines supplied by M/s. BHEL. The Hydraulic system of the Power Station consists of a diversion dam at Maneri and about 6.5 Km long, 6 m dia pressure tunnel, surge tank at the end of tunnel and a single penstock controlled by a gate at surge tank, trifurcating into three units penstock near the upstream of Power Station building, each controlled by a spherical valve of 1.8 m dia operating under a head of about 180 m. Each unit is connected to the tail race channel through the draft tube controlled by a draft tube gate. The tail race is a short open channel connecting to river Bhagirathi.

Capital Expenditure

- 3.1.1.40. Expenditure for capital nature major maintenance & other works for the control period is projected at Rs. 80.28 Crores. The work wise details of capital nature major maintenance & other expenses are provided as **Annexure - 7**. The expenditures of the head office have been apportioned among the various 10 LHPs based on the capacity of the LHPs. 85% of the expenses is apportioned to existing 9 LHPs except MB-II, 10% is apportioned to MB-II & 5% is apportioned to SHPs. The apportionment sheet has been attached in the form of **Annexure - 12**. The year wise phasing of the capital expenditure during the control period is shown in the table below:

Table 55: Capital Expenditure for Major Maintenance & Other Works – Tiloth Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Land	-	-	-	-
Building	3.02	14.33	6.23	3.23
Major Civil Works	2.57	13.70	21.50	16.50
Plant & Machinery	2.24	4.64	-	-
Vehicles	0.10	-	-	-
Furniture & Fixtures	0.10	-	-	-
Office Equipments & Others	1.69	0.15	-	-
Total	9.73	32.82	27.73	19.73

3.1.1.41. Expenditure for capital nature works regarding RMU for the control period is projected at Rs. 103.30 Crores. The work wise details of RMU expenses are provided as **Annexure - 7**. The year wise phasing of the capital expenditure during the control period is shown in the table below:

Table 56: Capital Expenditure for RMU Works – Tiloth Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Land	-	-	-	-
Building	-	-	-	-
Major Civil Works	-	-	-	-
Plant & Machinery	40.73	67.17	17.75	18.38
Vehicles	-	-	-	-
Furniture & Fixtures	-	-	-	-
Office Equipments & Others	-	-	-	-
Total	40.73	67.17	17.75	18.38

3.1.1.42. Expenditure for capital nature works regarding DRIP for the control period is projected at Rs. 16.44 Crores. The expenditures all DRIPs have been submitted in separate chapter provided subsequently. The work wise details of DRIP expenses are provided as **Annexure – 13 (E)**. The year wise phasing of the capital expenditure during the control period is shown in the table below:

Table 57: Capital Expenditure for DRIP Works – Tiloth Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Land	-	-	-	-
Building	-	-	-	-
Major Civil Works	8.90	11.41	4.00	-
Plant & Machinery	0.54	1.03	-	-
Vehicles	-	-	-	-
Furniture & Fixtures	-	-	-	-
Office Equipments & Others	-	-	-	-
Total	9.44	12.44	4.00	-

3.1.1.43. Total Capital Expenditure including RMU & DRIP for the control period is projected at Rs. 200.02 Crores. The year wise phasing of the capital expenditure during the control period is shown in the table below:


(Purushottam Singh)
Director (Operation)
UJVN Ltd.
Dehradun

Table 58: Total Capital Expenditure for the control period – Tiloth Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Land	-	-	-	-
Building	3.02	14.33	6.23	3.23
Major Civil Works	11.47	25.11	25.50	16.50
Plant & Machinery	43.51	72.84	17.75	18.38
Vehicles	0.10	-	-	-
Furniture & Fixtures	0.10	-	-	-
Office Equipments & Others	1.69	0.15	-	-
Total	59.90	112.43	49.48	38.11

Financing of Capital Expenditure:

3.1.1.44. The Project will be financed through a Debt: Equity ratio of 70:30. Out of Capex of Rs. 200.02 Crores planned during the control period, debt will be Rs. 140.01 Crores and equity contribution will be Rs. 60.01 Crores. Equity will be provided from budgetary support of GoU envisaged for UJVN Limited while debt will be provided by financial institutions like PFC, REC, NABARD, IREDA etc. Year-wise allocation of debt and equity for the control period is provided in the table below:

Table 59: Funding Pattern during the Control Period – Tiloth Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Capital Expenditure	59.90	112.43	49.48	38.11
Debt (70%)	41.93	78.70	34.63	26.68
Equity (30%)	17.97	33.73	14.84	11.43

Capitalization Schedule:

3.1.1.45. Total capital expenditure of Rs. 200.02 Crores will get capitalized during the control period. The year wise capitalization has been done to avoid the tariff shocks. Year-wise capitalization during the control period is provided in the table below:

Table 60: Capitalization during the Control Period – Tiloth Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Land	-	-	-	-
Building	3.02	14.33	6.23	3.23
Major Civil Works	11.47	25.11	25.50	16.50
Plant & Machinery	43.51	72.84	17.75	18.38
Vehicles	0.10	-	-	-
Furniture & Fixtures	0.10	-	-	-
Office Equipments & Others	1.69	0.15	-	-
Total	59.90	112.43	49.48	38.11

Chilla Power Station (144 MW)

Background:

- 3.1.1.46. The Power Station is a Run-of-River scheme on river Ganga located upstream of the holy city Hardwar and was commissioned in the year 1980.
- 3.1.1.47. The Power Station has four units of 36 MW each. The four Kaplan Vertical Shaft Turbines operate at a head of 32.5 m. Water of River Ganga from Pashulok Barrage is diverted through a Power Channel to feed the turbines of Chilla Power Station.

Capital Expenditure

- 3.1.1.48. Expenditure for capital nature major maintenance & other works for the control period is projected at Rs. 97.70 Crores. The work wise details of capital nature major maintenance & other expenses are provided as **Annexure - 8**. The expenditures of the head office have been apportioned among the various 10 LHPs based on the capacity of the LHPs. 85% of the expenses is apportioned to existing 9 LHPs except MB-II, 10% is apportioned to MB-II & 5% is apportioned to SHPs. The apportionment sheet has been attached in the form of **Annexure - 12**. The year wise phasing of the capital expenditure during the control period is shown in the table below:

Table 61: Capital Expenditure for Major Maintenance & Other Works – Chilla Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Land	-	-	-	-
Building	2.44	0.45	3.56	1.98
Major Civil Works	4.57	13.64	7.58	20.95
Plant & Machinery	12.81	26.22	8.06	15.00
Vehicles	0.01	-	0.16	-
Furniture & Fixtures	0.36	-	-	-
Office Equipments & Others	2.79	0.11	-	-
Total	22.99	40.41	19.36	37.93

- 3.1.1.49. Expenditure for capital nature works regarding RMU for the control period is projected at Rs. 120.00 Crores. The work wise details of RMU expenses are provided as **Annexure - 8**. The year wise phasing of the capital expenditure during the control period is shown in the table below:

Table 62: Capital Expenditure for RMU Works – Chilla Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Land	-	-	-	-
Building	-	-	-	-
Major Civil Works	-	-	-	-
Plant & Machinery	-	30.00	30.00	60.00
Vehicles	-	-	-	-
Furniture & Fixtures	-	-	-	-
Office Equipments & Others	-	-	-	-
Total	-	30.00	30.00	60.00

3.1.1.50. Expenditure for capital nature works regarding DRIP for the control period is projected at Rs. 46.83 Crores. The expenditures all DRIPs have been submitted in separate chapter provided subsequently. The work wise details of DRIP expenses are provided as **Annexure – 13 (C)**. The year wise phasing of the capital expenditure during the control period is shown in the table below:

Table 63: Capital Expenditure for DRIP Works – Chilla Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Land	-	-	-	-
Building	-	-	-	-
Major Civil Works	-	9.69	2.00	2.00
Plant & Machinery	7.59	9.92	8.06	15.00
Vehicles	-	-	0.16	-
Furniture & Fixtures	0.20	-	-	-
Office Equipments & Others	0.10	-	-	-
Total	7.89	19.61	10.22	17.00

3.1.1.51. Total Capital Expenditure including RMU & DRIP for the control period is projected at Rs. 264.53 Crores. The year wise phasing of the capital expenditure during the control period is shown in the table below:

Table 64: Total Capital Expenditure for the control period – Chilla Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Land	-	-	-	-
Building	2.44	0.45	3.56	1.98
Major Civil Works	4.57	23.33	9.58	22.95
Plant & Machinery	20.40	66.14	46.12	90.00
Vehicles	0.01	-	0.32	-
Furniture & Fixtures	0.56	-	-	-
Office Equipments & Others	2.89	0.11	-	-
Total	30.87	90.02	59.58	114.93

Financing of Capital Expenditure:

3.1.1.52. The Project will be financed through a Debt: Equity ratio of 70:30. Out of Capex of Rs. 264.53 Crores planned during the control period, debt will be Rs. 185.17 Crores and equity contribution will be Rs. 79.36 Crores. Equity will be provided from budgetary support of GoU envisaged for UJVN Limited while debt will be provided by financial institutions like PFC, REC, NABARD, IREDA etc. Year-wise allocation of debt and equity for the control period is provided in the table below:

Table 65: Funding Pattern during the Control Period – Chilla Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Capital Expenditure	30.87	90.02	59.58	114.93
Debt (70%)	21.61	63.02	41.71	80.45
Equity (30%)	9.26	27.01	17.88	34.48

Capitalization Schedule:

3.1.1.53. Total capital expenditure of Rs. 264.53 Crores will get capitalized during the control period. The year wise capitalization has been done to avoid the tariff shocks. Year-wise capitalization during the control period is provided in the table below:

Table 66: Capitalization during the Control Period – Chilla Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Land	-	-	-	-
Building	2.44	0.45	3.56	1.98
Major Civil Works	4.57	23.33	9.58	22.95
Plant & Machinery	20.40	66.14	46.12	90.00
Vehicles	0.01	-	0.32	-
Furniture & Fixtures	0.56	-	-	-
Office Equipments & Others	2.89	0.11	-	-
Total	30.87	90.02	59.58	114.93


 (Purushottam Singh)
 Director (Operation)
 UJVN Ltd.
 Dehradun

Khatima Power Station (41.40 MW)

Background:

- 3.1.1.54. The Power Station is located on the downstream of the Banbasa Barrage over River Sharda at a distance of 16 km on the irrigation canal which takes off from the Barrage. The Power Station was commissioned in the year 1955 & 1956. The surface Power Station comprising 3 units of 13.8 MW each with Kaplan turbines of 19200 HP output is located on the unlined irrigation canal. The water is utilized for the irrigation purpose in the command area of the canal. Design Head of the Power Station is 17.98 m.
- 3.1.1.55. The Khatima Power Station is a low head station with a design discharge of 269 cum. The discharge in the canal is regulated by Irrigation Department of Uttar Pradesh depending upon the irrigation requirement in the command area of the Irrigation canal and is also limited to the capacity of the escape channel downstream of the Power Station in case there is no demand.

Capital Expenditure

- 3.1.1.56. Expenditure for capital nature major maintenance & other works for the control period is projected at Rs. 93.55 Crores. The work wise details of capital nature major maintenance & other expenses are provided as **Annexure - 9**. The expenditures of the head office have been apportioned among the various 10 LHPs based on the capacity of the LHPs. 85% of the expenses is apportioned to existing 9 LHPs except MB-II, 10% is apportioned to MB-II & 5% is apportioned to SHPs. The apportionment sheet has been attached in the form of **Annexure - 12**. The year wise phasing of the capital expenditure during the control period is shown in the table below:

Table 67: Capital Expenditure for Major Maintenance & Other Works – Khatima Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Land	-	-	-	-
Building	2.11	6.42	1.02	0.57
Major Civil Works	0.02	5.00	25.00	12.64
Plant & Machinery	2.53	16.07	10.00	16.50
Vehicles	0.00	0.07	0.07	0.07
Furniture & Fixtures	0.06	0.08	-	-
Office Equipments & Others	0.77	0.03	-	-
Total	5.49	27.68	36.09	29.78

- 3.1.1.57. Total Capital Expenditure for the control period is projected at Rs. 93.55 Crores. UJVN Limited has not projected any RMU and DRIP expenditure during the control period. The year wise phasing of the capital expenditure during the control period is shown in the table below:

Table 68: Total Capital Expenditure for the control period – Khatima Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Land	-	-	-	-
Building	2.11	6.42	1.02	0.57
Major Civil Works	0.02	5.00	25.00	12.64
Plant & Machinery	13.97	16.07	10.00	16.50
Vehicles	0.00	0.07	0.07	0.07
Furniture & Fixtures	0.06	0.08	-	-
Office Equipments & Others	0.77	0.03	-	-
Total	16.93	27.68	36.09	29.78

Financing of Capital Expenditure:

3.1.1.58. The Project will be financed through a Debt: Equity ratio of 70:30. Out of Capex of Rs. 93.55 Crores planned during the control period, debt will be Rs. 65.48 Crores and equity contribution will be Rs. 28.06 Crores. Equity will be provided from budgetary support of GoU, envisaged for UJVN Limited while debt will be provided by financial institutions like PFC, REC, NABARD, IREDA etc. Year-wise allocation of debt and equity for the control period is provided in the table below:

Table 69: Funding Pattern during the Control Period – Khatima Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Capital Expenditure	16.93	27.68	36.09	29.78
Debt (70%)	11.85	19.37	25.27	20.84
Equity (30%)	5.08	8.30	10.83	8.93

Capitalization Schedule:

3.1.1.59. Total capital expenditure of Rs. 93.55 Crores will get capitalized during the control period. The year wise capitalization has been done to avoid the tariff shocks. Year-wise capitalization during the control period is provided in the table below:

Table 70: Capitalization during the Control Period – Khatima Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Land	-	-	-	-
Building	2.11	6.42	1.02	0.57
Major Civil Works	0.02	5.00	25.00	12.64
Plant & Machinery	13.97	16.07	10.00	16.50
Vehicles	0.00	0.07	0.07	0.07
Furniture & Fixtures	0.06	0.08	-	-
Office Equipments & Others	0.77	0.03	-	-
Total	16.93	27.68	36.09	29.78

Ramganga Power Station (198 MW)

Background:

- 3.1.1.60. The Power Station is a Reservoir based scheme on river Ramganga located near the famous Jim Corbett Park in district Pauri Garwhal and utilizes the water dammed up for irrigation purpose. The Project was commissioned in the year 1975. The water in the irrigation channel is regulated by Irrigation Department of Uttar Pradesh. The generation from Power Station is dependent on the rains in the catchment area and also on the drawl of water for irrigation purpose in the command area of the canal. The surface Power Station is located at the toe of the dam and houses 3 units of 66 MW each with Francis turbines of 92400 HP. Design Head of the Power Station is 84.4 m.
- 3.1.1.61. The Ramganga Power Station is a medium head scheme with a design discharge of 285 cum. The Project has unique challenges in operation due to restriction imposed on the release of water in the water conductor system by Irrigation Department of Uttar Pradesh which is dependent on the demand of water in the command area of the canal based on the irrigation requirement. The generation in the station takes place after the monsoon season when the demand for irrigation picks up.
- 3.1.1.62. UJVN Limited has done comprehensive study in-house for the modernisation and upgradation of the station.

Capital Expenditure

- 3.1.1.63. Total capital expenditure for the control period is projected at Rs. 48.93 Crores. The work wise details of capital nature major maintenance & other expenses are provided as **Annexure - 10**. The expenditures of the head office have been apportioned among the various 10 LHPs based on the capacity of the LHPs. 85% of the expenses is apportioned to existing 9 LHPs except MB-II, 10% is apportioned to MB-II & 5% is apportioned to SHPs. Total capital expenditure projected by UJVN Limited of Rs. 48.93 Crores regarding expenditure for capital nature major maintenance & other works. UJVN Limited has not projected any RMU and DRIP expenditure during the control period. The apportionment sheet has been attached in the form of **Annexure - 12**. The year wise phasing of the capital expenditure during the control period is shown in the table below:

Table 71: Capital Expenditure for Major Maintenance & Other Works – Ramganga Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Land	-	-	-	-
Building	3.35	0.62	4.90	2.72
Major Civil Works	0.09	-	-	-
Plant & Machinery	29.95	18.20	17.56	4.79
Vehicles	0.02	-	-	-
Furniture & Fixtures	0.08	-	-	-
Office Equipments & Others	3.69	0.15	-	-
Total	37.18	18.97	22.46	7.50

Financing of Capital Expenditure:

3.1.1.64. The Project will be financed through a Debt: Equity ratio of 70:30. Out of Capex of Rs. 48.93 Crores planned during the control period, debt will be Rs. 34.25 Crores and equity contribution will be Rs. 14.68 Crores. Equity will be provided from budgetary support of GoU envisaged for UJVN Limited while debt will be provided by financial institutions like PFC, REC, NABARD, IREDA etc. Year-wise allocation of debt and equity for the control period is provided in the table below:

Table 72: Funding Pattern during the Control Period – Ramganga Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Capital Expenditure	37.18	18.97	22.46	7.50
Debt (70%)	26.03	13.28	15.72	5.25
Equity (30%)	11.15	5.69	6.74	2.25

Capitalization Schedule:

3.1.1.65. Total capital expenditure of Rs. 48.93 Crores will get capitalized during the control period. The year wise capitalization has been done to avoid the tariff shocks. Year-wise capitalization during the control period is provided in the table below:

Table 73: Capitalization during the Control Period – Ramganga Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Land	-	-	-	-
Building	3.35	0.62	4.90	2.72
Major Civil Works	0.09	-	-	-
Plant & Machinery	29.95	18.20	17.56	4.79
Vehicles	0.02	-	-	-
Furniture & Fixtures	0.08	-	-	-
Office Equipments & Others	3.69	0.15	-	-
Total	37.18	18.97	22.46	7.50


(Purushottam Singh)
Director (Operation)
UJVN Ltd.
Dehradun

Maneri Bhali - II Hydroelectric Project (304 MW)

Background:

- 3.1.1.66. Maneri Bhali Stage-II Hydroelectric Project utilizes a 285 m drop available in river Bhagirathi between the tail waters of Tiloth Power Station (Maneri Bhali Stage-I Project) and the head waters of Tehri Dam. The diversion structure is a barrage situated at Joshiyara, Uttarkashi which is about 152 km from Rishikesh, the nearest railhead. Joshiyara Barrage is designed to divert 142 cumecs of water through a 6 m dia. and 16 km long Head Race Tunnel to feed four Francis Turbines of the Power Station at MB-II.
- 3.1.1.67. This project has been commissioned in 2008 and is the second Power Project of UJVN Limited on river Bhagirathi.

Capital Expenditure

- 3.1.1.68. Total capital expenditure for the control period is projected at Rs. 108.94 Crores. The work wise details of capital nature major maintenance & other expenses are provided as **Annexure - 11**. The expenditures of the head office have been apportioned among the various 10 LHPs based on the capacity of the LHPs. 85% of the expenses is apportioned to existing 9 LHPs except MB-II, 10% is apportioned to MB-II & 5% is apportioned to SHPs. Total capital expenditure projected by UJVN Limited of Rs. 108.94 Crores regarding expenditure for capital nature major maintenance & other works. UJVN Limited has not projected any RMU and DRIP expenditure during the control period. The apportionment sheet has been attached in the form of **Annexure - 12**. The year wise phasing of the capital expenditure during the control period is shown in the table below:

Table 74: Capital Expenditure for Major Maintenance & Other Works – MB - II Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Land	-	-	-	-
Building	4.48	11.60	11.01	8.53
Major Civil Works	11.25	8.10	3.80	1.00
Plant & Machinery	11.49	26.11	34.54	3.94
Vehicles	0.00	-	-	-
Furniture & Fixtures	0.10	-	-	-
Office Equipments & Others	5.57	0.31	-	-
Total	32.89	46.12	49.35	13.47

Financing of Capital Expenditure:

- 3.1.1.69. The Project will be financed through a Debt: Equity ratio of 70:30. Out of Capex of Rs. 108.94 Crores planned during the control period, debt will be Rs. 76.26 Crores and equity contribution will be Rs. 32.68 Crores. Equity will be provided from budgetary support of GoU envisaged for UJVN Limited while debt will be provided by financial institutions like PFC, REC, NABARD, IREDA etc. Year-wise

allocation of debt and equity for the control period is provided in the table below:

Table 75: Funding Pattern during the Control Period – MB - II Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Capital Expenditure	32.89	46.12	49.35	13.47
Debt (70%)	23.02	32.28	34.55	9.43
Equity (30%)	9.87	13.84	14.81	4.04

Capitalization Schedule:

3.1.1.70. Total capital expenditure of Rs. 108.94 Crores will get capitalized during the control period. The year wise capitalization has been done to avoid the tariff shocks. Year-wise capitalization during the control period is provided in the table below:

Table 76: Capitalization during the Control Period – MB - II Project (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Land	-	-	-	-
Building	4.48	11.60	11.01	8.53
Major Civil Works	11.25	8.10	3.80	1.00
Plant & Machinery	11.49	26.11	34.54	3.94
Vehicles	0.00	-	-	-
Furniture & Fixtures	0.10	-	-	-
Office Equipments & Others	5.57	0.31	-	-
Total	32.89	46.12	49.35	13.47


(Purushottam Singh)
 Director (Operation)
 UJVN Ltd.
 Dehradun

Refurbishment of Asan Barrage, at Dhalipur (Dehradun)

- 3.1.1.71. Yamuna Hydel Scheme Stage-IV envisages power generation by utilizing the tail race water of the Yamuna Hydel Scheme Stage-I along with flow of Asan River. To use water from river Asan, Asan Barrage is constructed at Dhalipur in District Dehradun along with a power channel to carry water to Kulhal power house of 30 MW installed capacity which has been constructed at the end of the power channel near village Kulhal. The construction of this project was completed in 1975.
- 3.1.1.72. Asan Barrage had been operated & maintained by Irrigation Department-Uttarakhand till 30th April, 2010 and since then it is being run and maintained by UJVN Limited.
- 3.1.1.73. In the last 35 years, no major repair of the Asan barrage and its associated structure has been done. Even it faced many floods. Due to record rainfall in August and September, 2010, heavy floods have damaged treatment works in upstream as well as in downstream of the barrage.
- 3.1.1.74. The Asan Barrage, proposed for refurbishment has spent life of more than 36 years. Since commissioning of the project, it has been continuously under operation for diverting water to generating plants. It underwent heavy floods during monsoon period, every year carrying heavy logs and boulders with it. With the passage of time and continuous operation, a lot of defects in the infrastructure have developed. The sills and other components of Asan Barrage have gone weary. After creation of Uttarakhand state, the government has given a major thrust on the development of Hydro electric projects. A lot of work is being done by Uttarakhand Government towards making Uttarakhand an "Energy state". Under present scenario, apart from implementation of new projects it has become essential that maximum energy be harnessed from existing projects also. To ensure its reliable operation refurbishment of Asan Barrage is essentially required.
- 3.1.1.75. The refurbishment shall prevent the leakage of water from Asan Barrage, during lean season, which shall be utilized for generating more electricity. Further, its refurbishment is essential for its life extension and hassle free operation. Repair of damaged structures/components of Asan Barrage will certainly prevent further deterioration of structures/components so that threat to these structures and any loss of power generation may be averted in future.
- 3.1.1.76. The cost of Refurbishment of Asan Barrage of Rs. 32.99 Crores has projected by UJVNL during the control period of FY 2019-20 to FY 2021-22. The work is to be carried out under World Bank funded DRIP (Dam Rehabilitation and Improvement Project) Scheme. The expenses under this head has been booked under additional capital expenditure head for Kulhal HEP. The workwise DRIP expenses has been attached in the form of Annexure – 13 (A).

Refurbishing of Ichari Dam, at Ichari, Koti (Dehradun)

- 3.1.1.77. Ichari Dam was built under Yamuna Hydro Electric Scheme Stage-II and it has been in operation since 1975. It is a straight Gravity Dam of 59.25 meter height from deepest foundation level with a live storage capacity of 5.11 million cum for diurnal variation. The total length of the dam at top is about 155 m with seven spilling bays each of 9.50 m clear opening. Spillways are provided with 16.50 m high and 9.5 m wide radial gates. The energy dissipation arrangement consists of slotted roller bucket in all spillway bays. Due to poor site conditions, special treatment on left bank of dam in D/S as well as in upstream has been made.
- 3.1.1.78. Ichari Dam was being operated and maintained by Irrigation Department up to 30/04/2010. Since the midnight of 30/04/2010, the dam is being operated and maintained by UJVN Limited.
- 3.1.1.79. For the last 35 years the dam has encountered many floods and no major refurbishment of dam and its associated structures/equipment has been carried out. Heavy floods due to record rainfall in August and September 2010 have further damaged the treatment provided in upstream as well as downstream of the dam.
- 3.1.1.80. The Ichari dam proposed for refurbishing has spent life of more than 35 years. Since commissioning, the dam is continuously under operation for diverting water to generating plants. Every year it encounters heavy floods during monsoon period, carrying heavy logs and boulders with it. With the passage of time and continuous operation a lot of defects in the Hydro-mechanical equipment have developed along with wear & tear. The sills and other components of Ichari Dam have gone weary. After creation of Uttarakhand state, the government has provided a major thrust on the development of Hydroelectric projects. A lot of work is being done by Uttarakhand Government towards making Uttarakhand an "Energy state". Under present scenario, apart from implementation of new projects it has become essential that maximum energy be harnessed from existing projects also.
- 3.1.1.81. Since no major repair works have been carried out on Ichari Dam so far, its refurbishment is essentially required. The refurbishing shall prevent the leakage of water from Ichari Dam during lean season which would be utilized for generating more electricity. Further, its refurbishment is essential in view of its life extension and hassle-free operation. Repair of damaged structures/components of Ichari Dam will certainly prevent further deterioration of structures/components so that threat to these structures and any loss of power generation may be averted in future.

The cost of Refurbishment of Ichari Dam of Rs 20.72 Crores has projected by UJVNL during the control period of FY 2019-20 to FY 2021-22. The work is to be carried out under World Bank funded DRIP Scheme. The expenses of this category have been put under the additional capital expenditure of Chibro and Khodri HEPs on the basis of the capacity of these two plants. The workwise DRIP expenses has been attached in the form of Annexure – 13 (B).

Rehabilitation Work of Virbhadra Barrage, Pashulok, Rishikesh

3.1.1.82. Virbhadra barrage was constructed and commissioned in the year 1980 and during its Thirty years of operation, various components of barrage have gone under heavy wear and tear and are posing troubles during operational activity for passing the flood safely into downstream. After construction of Tehri and Koteshwar Dam, Virbhadra Barrage, Pashulok is playing its important role round the year for consistent power generation. In view of its importance and to ensure reliable operation Virbhadra barrage needs to be rehabilitated. Following are the main components where rehabilitation is required:

- a. All gates of barrage, head regulator and silt ejector.
- b. Piers and apron of barrage
- c. Afflux bund seepage drain of pond.
- d. Service road of afflux bund.
- e. Painting on steel structures of barrage.
- f. Painting on civil structures of barrage.
- g. Electro- mechanical components such as motors and brake shoes.
- h. Luminaries of barrage.
- i. Renovation of Barrage Control Room including improvement of sanitation facility
- j. Installation of Trash Rack Cleaning Machine
- k. Automation of Barrage

3.1.1.83. Closure for special repair of submerged parts of Power channel and hydro mechanical components is necessary as the above said project runs throughout the year without any interruption except in high flood condition. A lot of wear & tear of very serious nature in civil structures as well as hydro-mechanical equipment takes place every year and therefore routine maintenance of submerged parts of structures is not possible. Since the commissioning of this project no regular closure have been taken for inspection and repair works of power channel and hydro-mechanical equipment. Lining and bed of power channel is severely damaged and is required to be repaired. In view of expected extensive damage to the components leading to loss of generation from projects any delay in the repair of power channel is undesirable.

3.1.1.84. The cost of Refurbishment of Virbhadra Barrage of Rs 46.83 Crores has projected by UJVNL during the control period of FY 2019-20 to FY 2021-22. The work is to be carried out under World Bank funded DRIP (Dam Rehabilitation and Improvement Project) Scheme. The expenses of this category have been put under the additional capital expenditure of Chilla HEP. The workwise DRIP expenses has been attached in the form of **Annexure – 13 (C)**.


(Purushottam Singh)
Director (Operation)
UJVN Ltd.
Dehradun

Refurbishment of Dakpathar Barrage, at Dakpathar (Dehradun)

- 3.1.1.86. A Barrage of 543.3m length with head regulator was commissioned in 1965 as a run-of-river scheme across river Yamuna at Dakpathar in Dehradun. From the barrage a flow of 198 cum/sec is diverted and conveyed through a power channel to Dhakrani (33.75MW) Powerhouse and Dhalipur (51 MW) Powerhouse where heads of 19.80 m and 30.50 m respectively are utilized for power generation. After generating power at Dhalipur power house, the diverted water from Dakpathar Barrage meets Asan river/pond behind Asan Barrage.
- 3.1.1.87. Dakpathar Barrage is provided with 6 nos. under sluices and 19 nos. spillway bays to discharge floods of River Yamuna. The head regulator takes off at an angle of 110° towards left bank of barrage. The provision of stop log gates is not available at the barrage. Therefore, a closure of powerhouse is required to carry out the repair work of gates and other submerged components of barrage. No repair work of submerged part has been carried out since 2005. During last seven years several floods have passed through the barrage and especially due to record floods in August and September 2010, the sill beams of gates and other associated structures have got severely damaged. As such restoration works are required to be taken up
- 3.1.1.88. The Dakpathar Barrage proposed for refurbishing has spent life of more than 46 years. Since the commissioning of the project, it is continuously under operation for diverting water to generating plants. Every year it has encountered heavy floods during monsoon period carrying heavy logs and boulders with it. With the passage of time and continuous operation a lot of defects in the installed system have developed. The sills and other components of Dakpathar Barrage have gone weary. After creation of Uttarakhand state, the government has provided a major thrust on the development of Hydroelectric projects. A lot of work is being done by Uttarakhand Government towards making Uttarakhand an "Energy state". Under present scenario, apart from implementation of new projects it has become essential that maximum energy be harnessed from existing projects also.
- 3.1.1.89. Since no major repair works have been carried out on Dakpathar Barrage so far, its refurbishment is essentially required. The refurbishing shall prevent the leakage of water from Dakpathar Barrage during lean season which would be utilized for generating more electricity. Further, its refurbishment is essential in view of its life extension and hassle-free operation. Repair of damaged structures/components of Dakpathar Barrage will certainly prevent further deterioration of structures/components so that threat to these structures and any loss of power generation may be averted in future.
- 3.1.1.90. The cost of Refurbishment of Dakpathar Barrage of Rs 6.25 Crores has projected by UJVNL during the control period of FY 2019-20 to FY 2021-22. The work is to be carried out under World Bank funded DRIP Scheme. The expenses of this category have been put under the additional capital expenditure of Dhakrani and Dhalipur HEPs on the basis of the capacity of these two plants. The workwise DRIP expenses has been attached in the form of **Annexure – 13 (D)**.

Refurbishment of Maneri Dam at Maneri, Uttarakshi

- 3.1.1.91. Maneri Dam is situated across river Bhagirathi at Maneri, 15 Km towards Gangotri from district Uttarkashi. It is a 39 m high concrete gravity dam with 4 nos. ogee spillways having crest elevation at 1280.5 m, each 13 m wide, separated by 4 m wide piers and followed by a roller bucket at an elevation of 1261 m.
- 3.1.1.92. The power intake consists of 4 bays with sill beam level at the elevation of 1283.25 m and is located on left bank of river and designed for a maximum discharge of 99 cumecs. Out of this discharge 70 cumec is carried out through 8.86 Km long head race tunnel for power generation at Tiloth Power House (90 MW) & rest is discharged through flushing tunnel. The capacity of the dam reservoir is 0.6 million cubic meters.
- 3.1.1.93. Maneri Bhali Stage-I (3 x 30 MW) was commissioned in the year 1984 and it was constructed by UP Irrigation Department and financed by UPSEB. Since then Operation & Maintenance was carried out by Irrigation Department but since 19.10.08, the Operation & Maintenance of Maneri Dam has been taken over from Irrigation department by UJVN Ltd.
- 3.1.1.94. During its life, the Maneri Dam has faced several floods including the disastrous flood in August, 1978 and due to this flood, the reservoir got silted fully up to crest and since then, the total sediment load carried by the river has been passing through the spillway. Further, due to heavy floods in August and September, 2010, the sill beam of gates and other associated structures have got damaged severely.
- 3.1.1.95. There is an acute bend just upstream of dam spillway structure with a reverse acute bend about 50 m downstream of spillway structure. In addition to this a protruding rock cliff exists on the left bank downstream of spillway/dam axis. The above topographical features combined with floods induce the asymmetrical flow of water in the dam structure in the Upstream as well as Downstream sides. Moreover, the rolling down boulders along with heavy sediment load pass through the spillway, which often damages the surface of spillway and roller bracket.
- 3.1.1.96. The refurbishment shall prevent the leakage of water from Maneri Dam, during lean season, which shall be utilized for generating more electricity. Further, its refurbishment is essential in view of its life extension and hassle-free operation. Repair of damaged structures/components of Maneri Dam will certainly prevent further deterioration of structures/components so that threat to these structures and any loss of power generation may be averted in future.
- 3.1.1.97. The cost of Refurbishment of Maneri Dam of Rs 16.44 Crores has projected by UJVNL during the control period of FY 2019-20 to FY 2021-22. The work is to be carried out under World Bank funded DRIP (Dam Rehabilitation and Improvement Project) Scheme. The expenses of this category have been put under the additional capital expenditure of Tioth HEP. The workwise DRIP expenses has been attached in the form of Annexure – 13 (E).

Table 77: Summary of expenses proposed under DRIP Schemes (Rs. in Crores)

Particulars	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Maneri Dam	9.44	12.44	4.00	-
Ichari Dam	10.26	17.26	3.46	-
Asan Baarage	5.27	23.92	7.12	1.95
Dakpathar Barrage	9.35	6.25	-	-
Virbhadra / Pasulok Barrage	7.89	19.61	10.22	17.00
Total	42.21	79.48	24.80	18.95

Capex at various power stations is subject to necessary approval from competent authority


(Purushottam Singh)
 Director (Operation)
 UJVN Ltd.
 Dehradun

MAJOR SHUTDOWN PLAN OF POWER STATIONS

Major Shutdown Plan of Power Stations

3.1.1.98. Availability of a generating unit is dependent on the outages taken for the unit, both forced and planned. While the forced outages are minimized by having a robust maintenance plan, the planned outages are necessary for the smooth functioning of the unit. Either or all the following is included in an outage:

- a. Schedule Preventive Measures
- b. Audit History based Maintenance
- c. Overall Operational Constraints
- d. Technological Upgradation
- e. Performance Improvement Measures
- f. Statutory Compliances
- g. Life Sustenance, Extension, Enhancement Actions

3.1.1.99. For enhancing the life of the plant and to get generation on sustained basis from the power station, timely maintenance of the power station and replacement of old equipment is essential. Most of the Power Stations of UJVN Limited are quite old and their units, auxiliaries and associated systems need major repair/renovation, modernization and uprating for enhancing the Generation output, Plant Availability and to cope-up with the technological changes taking place from time to time. Identifying the need and importance of RMU of Old Power Stations, UJVN Limited is proactively taking up RMU of its different Power Stations.

3.1.1.100. Considering the present power requirement of Uttarakhand state, UJVN Ltd. has staggered the RMU of its Power Stations and the RMU is being done in phases. The outages of various units during routine annual maintenance are staggered and planned based on expected generation from various units and criticality of the outage requirement. The outage plan may change based on the exigencies of the business. The proposed outage plan for the various generating units of UJVN Limited during the control period is shown in the table below:



(Purushottam Singh)
Director (Operation)
UJVN Ltd.
Dehradun

Table 78: Outage Plan of UJVN Limited for FY 2018-19

Outage Plan for the FY 2018-19						
Sr. No.	Name of Power Station	Unit No.	Date of Start	Date of Completion	No of Days	Remarks
1	Chibro (4x60)	Unit 1	10-12-2018	04-03-2019	84	CM
		Unit 2	11-03-2019	31-03-2019	20	AM
		Unit 3	-	-	-	-
		Unit 4	15-11-2018	05-12-2018	20	AM
2	Khodri (4x30)	Unit 1	-	-	-	-
		Unit 2	15-11-2018	14-12-2018	29	AM
		Unit 3	15-12-2018	31-03-2019	106	CM
		Unit 4	15-12-2018	31-03-2019	106	CM
3	Dhakrani (3x11.25)	Unit 1	30-01-2019	31-03-2019	60	CM
		Unit 2	23-12-2018	26-01-2019	34	AM
		Unit 3	15-11-2018	19-12-2018	34	AM
4	Dhalipur (3x17)	Unit 1	25-11-2018	30-12-2018	35	AM
		Unit 2	09-12-2018	31-03-2019	112	RMU
		Unit 3	01-01-2019	14-02-2019	44	AM
5	Kulhal (3x10)	Unit 1	-	-	-	-
		Unit 2	05-01-2019	04-02-2019	30	AM
		Unit 3	01-12-2018	31-03-2019	120	CM
6	Tiloth (3x30)	Unit 1	26-03-2018	29-04-2018	34	AM
			22-07-2018	30-08-2018	39	AM
			13-12-2018	31-03-2019	108	RMU
		Unit 2	22-07-2018	27-08-2018	36	AM
			15-01-2019	26-02-2019	42	AM
		Unit 3	22-07-2018	26-08-2018	35	AM
15-01-2019	03-02-2019	19	AM			
7	MB - II (4x76)	Unit 1	10-11-2018	13-01-2019	64	AM
		Unit 2	15-11-2018	18-01-2019	64	AM
		Unit 3	20-01-2019	25-03-2019	64	AM
		Unit 4	25-01-2019	30-03-2019	64	AM
8	Chilla (4x36)	Unit 1	10-12-2018	29-01-2019	50	AM
		Unit 2	24-03-2019	31-03-2019	7	AM
		Unit 3	01-02-2019	22-03-2019	49	AM
		Unit 4	15-11-2018	31-03-2019	136	Restoration Works
9	Ramganga (3x66)	Unit 1	23-09-2018	02-11-2018	40	AM
		Unit 2	22-08-2018	03-10-2018	42	AM
		Unit 3	01-02-2019	31-03-2019	58	CM & Other Works
10	Khatima (3x13.8)	Unit 1	22-02-2019	28-03-2019	34	AM
		Unit 2	10-01-2019	13-02-2019	34	AM
		Unit 3	22-11-2018	31-12-2018	39	AM

Table 79: Outage Plan of UJVN Limited for FY 2019-20

Outage Plan for the FY 2019-20						
Sr. No.	Name of Power Station	Unit No.	Date of Start	Date of Completion	No of Days	Remarks
1	Chibro (4x60)	Unit 1	15-11-2019	05-12-2019	20	AM
		Unit 2	11-12-2019	31-12-2019	20	AM
		Unit 3	08-04-2019	28-04-2019	20	AM
			08-01-2020	28-01-2020	20	AM
		Unit 4	05-02-2020	25-02-2020	20	AM
2	Khodri (4x30)	Unit 1	15-11-2019	05-12-2019	20	AM
		Unit 2	11-12-2019	31-12-2019	20	AM
		Unit 3	01-04-2019	02-05-2019	31	CM
		Unit 4	01-04-2019	02-04-2019	1	CM
3	Dhakrani (3x11.25)	Unit 1	01-04-2019	29-05-2019	58	CM
			30-01-2020	04-03-2020	34	AM
		Unit 2	23-12-2019	26-01-2020	34	AM
		Unit 3	15-11-2019	19-12-2019	34	AM
4	Dhalipur (3x17)	Unit 1	09-12-2019	31-03-2020	113	RMU
		Unit 2	01-04-2019	08-07-2019	98	RMU
		Unit 3	01-01-2020	14-02-2020	44	AM
5	Kulhal (3x10)	Unit 1	01-04-2019	30-04-2019	29	AM
		Unit 2	15-11-2019	14-03-2020	120	CM
		Unit 3	-	-	-	-
6	Tiloth (3x30)	Unit 1	01-04-2019	12-12-2019	255	RMU
		Unit 2	15-07-2019	04-08-2019	20	AM
			15-01-2020	14-02-2020	30	AM
		Unit 3	15-07-2019	14-08-2019	30	AM
			13-12-2019	31-03-2020	109	RMU
7	MB - II (4x76)	Unit 1	25-10-2019	29-12-2019	65	AM
		Unit 2	15-11-2019	18-01-2020	64	AM
		Unit 3	05-01-2020	10-03-2020	65	AM
		Unit 4	25-01-2020	30-03-2020	65	AM
8	Chilla (4x36)	Unit 1	01-12-2019	31-03-2020	121	RMU
		Unit 2	01-04-2019	12-05-2019	41	AM
			01-12-2019	04-01-2020	34	AM
		Unit 3	07-02-2020	13-03-2020	35	AM
9	Ramganga (3x66)	Unit 4	01-04-2019	30-11-2019	243	Restoration Works
		Unit 1	15-06-2019	09-02-2020	239	CM
		Unit 2	20-07-2019	23-08-2019	34	AM
		Unit 3	01-04-2019	28-09-2019	180	CM & Other Works
10	Khatima (3x13.8)	Unit 1	22-02-2020	28-03-2020	35	AM
		Unit 2	10-01-2020	13-02-2020	34	AM
		Unit 3	22-11-2019	31-12-2019	39	AM

Table 80: Outage Plan of UJVN Limited for FY 2020-21

Outage Plan for the FY 2020-21						
Sr. No.	Name of Power Station	Unit No.	Date of Start	Date of Completion	No of Days	Remarks
1	Chibro (4x60)	Unit 1	15-11-2020	05-12-2020	20	AM
		Unit 2	15-12-2020	04-01-2021	20	AM
		Unit 3	15-01-2021	04-02-2021	20	AM
		Unit 4	15-01-2021	07-02-2021	23	AM
2	Khodri (4x30)	Unit 1	15-11-2020	05-12-2020	20	AM
		Unit 2	15-12-2020	04-01-2021	20	AM
		Unit 3	15-01-2021	04-02-2021	20	AM
		Unit 4	15-01-2021	07-02-2021	23	AM
3	Dhakrani (3x11.25)	Unit 1	01-11-2020	31-03-2021	150	RMU
		Unit 2	23-12-2020	26-01-2021	34	AM
		Unit 3	30-01-2021	05-03-2021	34	AM
4	Dhalipur (3x17)	Unit 1	01-04-2020	08-07-2020	98	RMU
		Unit 2	01-01-2021	14-02-2021	44	AM
		Unit 3	09-12-2020	31-03-2021	112	RMU
5	Kulhal (3x10)	Unit 1	15-11-2020	30-12-2020	45	AM
		Unit 2	01-01-2021	14-02-2021	44	AM
		Unit 3	15-02-2021	31-03-2021	44	AM
6	Tiloth (3x30)	Unit 1	15-07-2020	14-08-2020	30	AM
			15-01-2021	31-01-2021	16	AM
		Unit 2	15-07-2020	14-08-2020	30	AM
			13-12-2020	31-03-2021	108	RMU
Unit 3	01-04-2020	12-12-2020	255	RMU		
7	MB - II (4x76)	Unit 1	25-10-2020	29-12-2020	65	AM
		Unit 2	15-11-2020	18-01-2021	64	AM
		Unit 3	05-01-2021	10-03-2021	64	AM
		Unit 4	25-01-2021	30-03-2021	64	AM
8	Chilla (4x 36)	Unit 1	01-04-2020	30-11-2020	243	RMU
		Unit 2	01-12-2020	31-03-2021	120	RMU
		Unit 3	07-01-2021	13-02-2021	37	AM
		Unit 4	01-12-2020	04-01-2021	34	AM
9	Ramganga (3x66)	Unit 1	-	-	-	-
		Unit 2	15-06-2020	09-02-2021	239	CM
		Unit 3	15-06-2020	19-07-2020	34	AM
10	Khatima (3x13.8)	Unit 1	22-02-2021	18-03-2021	24	AM
		Unit 2	10-01-2021	13-02-2021	34	AM
		Unit 3	22-11-2020	31-12-2020	39	AM

Table 81: Outage Plan of UJVN Limited for FY 2021-22

Outage Plan for the FY 2021-22						
Sr. No.	Name of Power Station	Unit No.	Date of Start	Date of Completion	No of Days	Remarks
1	Chibro (4x60)	Unit 1	15-11-2021	05-12-2021	20	AM
		Unit 2	15-12-2021	04-01-2022	20	AM
		Unit 3	15-01-2022	04-02-2022	20	AM
		Unit 4	15-02-2022	07-03-2022	20	AM
2	Khodri (4x30)	Unit 1	15-11-2021	05-12-2021	20	AM
		Unit 2	15-12-2021	04-01-2022	20	AM
		Unit 3	15-01-2022	04-02-2022	20	AM
		Unit 4	15-02-2022	07-03-2022	20	AM
3	Dhakrani (3x11.25)	Unit 1	01-04-2021	31-05-2021	60	RMU
		Unit 2	01-11-2021	31-03-2022	150	RMU
		Unit 3	30-01-2022	05-03-2022	34	AM
4	Dhalipur (3x17)	Unit 1	01-01-2022	14-02-2022	44	AM
		Unit 2	15-02-2022	21-03-2022	34	AM
		Unit 3	01-04-2021	08-07-2021	98	RMU
5	Kulhal (3x10)	Unit 1	15-11-2021	30-12-2021	45	AM
		Unit 2	01-01-2022	14-02-2022	44	AM
		Unit 3	15-02-2022	31-03-2022	44	AM
6	Tiloth (3x30)	Unit 1	15-07-2021	14-08-2021	30	AM
			15-01-2022	15-02-2022	31	AM
		Unit 2	01-04-2021	12-12-2021	255	RMU
		Unit 3	15-07-2021	14-08-2021	30	AM
16-02-2022	03-03-2022		15	AM		
7	MB - II (4x76)	Unit 1	25-10-2021	29-12-2021	65	AM
		Unit 2	15-11-2021	18-01-2022	64	AM
		Unit 3	05-01-2022	10-03-2022	64	AM
		Unit 4	25-01-2022	30-03-2022	64	AM
8	Chilla (4x36)	Unit 1	-	-	-	-
		Unit 2	01-04-2021	30-11-2021	243	RMU
		Unit 3	01-12-2021	31-03-2022	120	RMU
		Unit 4	01-12-2021	31-03-2022	120	RMU
9	Ramganga (3x66)	Unit 1	20-07-2021	23-08-2021	34	AM
		Unit 2	-	-	-	-
		Unit 3	15-06-2021	19-07-2021	34	AM
10	Khatima (3x13.8)	Unit 1	22-02-2022	28-03-2022	34	AM
		Unit 2	10-01-2022	13-02-2022	34	AM
		Unit 3	22-11-2021	13-12-2021	21	AM

AM: Annual Maintenance, CM: Capital maintenance, RMU: Renovation & Modernization

4. Trajectory of performance parameters

Gross Generation and Design Energy

Table 82: Gross Generation and Design Energy (In MUs)

Sr. No.	Power Station	Design Energy	FY 2017-18	FY 2018-19 (Apr-Sep)	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
1	Chibro	750.00	784.87	497.92	806.50	780.00	780.00	780.00
2	Khodri	345.00	355.73	221.25	361.10	350.00	350.00	350.00
3	Dhakrani	156.88	129.68	83.20	131.40	143.00	143.00	143.00
4	Dhalipur	192.00	186.79	124.26	202.00	180.00	180.00	180.00
5	Kulhal	153.91	124.21	79.44	134.80	138.00	140.00	140.00
6	Tiloth	395.00	394.77	248.91	420.00	275.00	291.00	331.00
7	Dharasu	1566.10	1276.66	959.50	1262.30	1268.00	1272.00	1276.00
8	Chilla	671.29	812.11	312.58	790.00	550.00	650.00	650.00
9	Ramganga	311.00	249.82	47.06	192.00	205.00	210.00	215.00
10	Khatima	194.05	212.54	136.29	201.50	235.00	235.00	235.00
11	Vyasi	375.24	NA	NA	NA	NA	375.24	375.24
Total LHPs		5110.47	4527.18	2710.40	4501.60	4124.00	4626.24	4675.24

Power Stations except MB-I, MB-II, Chibro, Khodri & Ramganga are run of the river stations and thus are highly dependent on water availability and monsoon for electricity generation.

Currently, UJVNL has a total existing operating capacity of 1292.10 MW. The total installed capacity consists of 1252.15 MW of LHPs and 39.95 MW of SHPs (namely Pathri, Mohammadpur, Galogi, Dunao, Pilangad and Urgam). UJVNL plans to commission the Vyasi HEP having capacity of 120 MW during the control period.


(Purushottam Singh)
 Director (Operation)
 UJVN Ltd.
 Dehradun

NAPAF

Table 83: NAPAF and PAF from FY 2016-17 to FY 2018-19

Sr. No.	Name of the Project	NAPAF Approved by			PAF		
		2016-17	2017-18	2018-19	2016-17 (Actual)	2017-18 (Actual)	2018-19 (Projected)
1	Chibro	65.06%			66.75%	64.95%	63.44%
2	Khodri	57.23%			58.96%	57.84%	57.13%
3	Chilla	74.00%			73.83%	72.80%	53.04%
4	Tiloth	79.00%			59.72%	63.64%	68.92%
5	Ramganga	19.00%			10.81%	15.29%	15.29%
6	MB - II	61.51%	82.00%	82.00%	65.15%	65.17%	64.11%
7	Dhakrani	61.04%	66.17%	60.94%	54.88%	59.70%	59.19%
8	Dhalipur	57.26%	61.07%	58.62%	55.02%	59.64%	60.42%
9	Kulhal	65.00%	65.00%	67.14%	71.61%	71.64%	74.02%
10	Khatima	47.21%	69.30%	69.30%	55.73%	64.37%	67.21%

PAF Trajectory during the control period

The plant availability during the control period considering maintenance schedule given above and forced outages expected is shown below:

Table 84: PAF trajectory during the control period, FY 2019-20 to FY 2021-22

Sr. No.	Name of the Project	FY 2019-20	FY 2020-21	FY 2021-22
1	Chibro	63.00%	63.00%	63.00%
2	Khodri	55.00%	55.00%	55.00%
3	Chilla	56.00%	56.00%	44.00%
4	Tiloth	52.00%	53.00%	57.00%
5	Kalagarh	15.00%	15.00%	15.00%
6	MB - II	66.00%	66.00%	66.00%
7	Dhakrani	60.00%	50.00%	40.00%
8	Dhalipur	40.00%	40.00%	50.00%
9	Kulhal	65.00%	65.00%	65.00%
10	Khatima	65.00%	65.00%	65.00%

**On the basis of historical trends*

It is submitted that the UJVN has been making all endeavor to achieve the NAPAF target set by the Hon'ble Commission, however, due to reasons beyond the control and proposed RMU works, UJVN has not been able to achieve the target. UJVN requests the Hon'ble Commission to kindly consider & reduce the NAPAF of projects to achievable levels.

Revision of Design/Saleable energy on account of Order of Hon'ble NGT

Hon'ble National Green Tribunal (N.G.T.) has issued an order on date 09.08.2017 regarding release of minimum discharge in to the rivers. In compliance of the Order of Hon'ble NGT, the Government of Uttarakhand has issued order no 708 dated 05.06.2018 to UJVN Ltd for maintaining the minimum 15% of the average lean season flow in the rivers from the Dams/Barrages situated in the state of Uttarakhand. In the meantime the Gazette notification has also been issued by Govt. of India on 09.10.2018 in this regard (Photo Copy enclosed at **Annexure - 14**).

In view of aforesaid orders of NGT and GoU, in order to maintain the minimum of 15% of the average lean season flow, the available water discharge shall be reduced in the tunnels/power channels of the power stations of UJVN Ltd. Consequent upon the reduction in the discharge available for power generation, the quantum of power generation as well as the declared capacity of the power plants shall to be reduced accordingly.

It is therefore requested to the Hon'ble UERC to kindly consider the impact of this order for FY 2018-19 to FY 2021-22. The total impact of lesser discharge is estimated to be 200 MUs, therefore the Hon'ble UERC is requested to consider total design energy of 10 LHPs of UJVNL as 4576.77 MUs in place of 4776.77 MUs.


(Purushottam Singh)
Director (Operation)
UJVN Ltd.
Dehradun

Auxiliary Consumption and Transformation Losses

Table 85: Auxiliary Consumption for FY 2016-17 to FY 2018-19

Power Station	FY2016-17			FY2017-18			FY2018-19			AUX Norms fix by Hrbble UFC (in%)
	Gross Generation (InMUs)	Auxiliary Consumption (MUs)+Transformation Loss (MU)	(Auxiliary Consumption +Transformation Loss) (in%)	Gross Generation (InMUs)	Auxiliary Consumption (MUs)+Transformation Loss (MU)	(Auxiliary Consumption +Transformation Loss) (in%)	Gross Generation (InMUs)	Auxiliary Consumption (MUs)+Transformation Loss (MU)	(Auxiliary Consumption +Transformation Loss) (in%)	
Chitro	71400	693	0.97	78487	586	0.75	80650	525	1.05	1.20
Krothi	33328	268	0.81	35573	267	0.75	36110	197	0.89	1.00
Chakari	12020	0.80	0.65	12968	1.11	0.85	13140	0.60	0.72	0.70
Chalipur	18040	1.47	0.81	18679	1.68	0.90	20200	0.76	0.61	0.70
Kulhal	12227	3.19	2.61	12421	1.83	1.47	13480	2.86	2.92	0.70
Tilath(MB-I)	34972	7.49	2.14	39477	6.60	1.67	42000	2.75	1.10	0.70
Dharasu(MB-II)	125185	854	0.68	127666	1131	0.89	126230	636	0.66	1.00
Chilla	76899	1309	1.70	81211	1410	1.74	79000	483	1.55	1.00
Panganga	18098	1.90	1.05	24982	1.19	0.47	19200	0.51	1.08	0.70
Khatina	18032	253	1.40	21254	267	1.26	20150	222	1.63	1.00
Patni	11896	1.78	1.50	13548	2.15	1.58	12400	1.23	1.83	1.00
Mhd Pur	5235	0.87	1.67	5646	1.06	1.87	5400	0.57	1.98	
Galog	657	0.09	1.40	699	0.08	1.12	617	0.09	1.50	
Dureo	NA	NA	NA	233	0.02	1.00	231	0.02	1.00	
Pilangad	NA	NA	NA	0.72	0.01	1.00	5.60	0.06	1.00	
Ugam	NA	NA	NA	1.34	0.01	1.00	6.32	0.06	1.00	


 (Purushottam Singh)
 Director (Operation)
 UJVN Ltd.
 Dehradun

Table 86: Auxiliary Consumption for the control period, FY 2019-20 to FY 2021-22

Power Station	FY 2019-20			FY 2020-21			FY 2021-22		
	Gross Generation (In MUs)	Auxiliary Consumption (MU)+Transformation Loss (MU)	(Auxiliary Consumption +Transformation Loss) (in %)	Gross Generation (In MUs)	Auxiliary Consumption (MU)+Transformation Loss (MU)	(Auxiliary Consumption +Transformation Loss) (in %)	Gross Generation (In MUs)	Auxiliary Consumption (MU)+Transformation Loss (MU)	(Auxiliary Consumption +Transformation Loss) (in %)
Chibro	780.00	9.36	1.20	780.00	9.36	1.20	780.00	9.36	1.20
Khodhi	350.00	3.50	1.00	350.00	3.50	1.00	350.00	3.50	1.00
Dhakrani	143.00	2.66	1.86	143.00	2.66	1.86	143.00	2.66	1.86
Dhalipur	180.00	0.13	0.85	180.00	0.13	0.85	180.00	0.24	0.90
Kulhal	138.00	3.92	2.84	140.00	3.95	2.82	140.00	3.96	2.79
Tiloth (MB-I)	275.00	3.03	1.10	291.00	2.91	1.00	331.00	3.31	1.00
Dharasu (MB-II)	1268.00	9.96	0.76	1272.00	9.98	0.78	1276.00	10.00	0.78
Chilla	550.00	7.50	1.33	650.00	7.00	1.20	650.00	6.00	1.20
Ranganga	205.00	0.85	0.43	210.00	0.87	0.43	215.00	0.88	0.42
Khatima	235.00	2.22	1.06	235.00	2.49	1.16	235.00	2.78	1.29
Vyasi	NA	NA	NA	375.24	3.75	1.00	375.24	3.75	1.00
Pathri	120.44	1.60	1.32	120.44	1.60	1.32	120.44	1.60	1.32
Mohd Pur	55.00	0.70	1.27	55.00	0.70	1.27	55.00	0.70	1.27
Galogj	6.17	0.06	1.50	6.17	0.06	1.50	6.17	0.06	1.50
Dunao	2.31	0.02	1.00	2.31	0.02	1.00	2.31	0.02	1.00
Pilangad	5.60	0.06	1.00	5.60	0.06	1.00	5.60	0.06	1.00
Urgan	6.32	0.06	1.00	6.32	0.06	1.00	6.32	0.06	1.00


 (Purushottam Singh)
 Director (Operation)
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5. ANNEXURES



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(Purushottam Singh)
Director (Operation)
UJVN Ltd.
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