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Public Notice

Discussion Paper on Determination of tariff for procurement of power by Distribution Licensees and others from Small Hydro Power Projects in the State of Gujarat, 2026

The Commission has prepared the Discussion Paper on Determination of tariff for procurement of power by Distribution Licensees and others from Small Hydro Power Projects in the State of Gujarat, 2026 in exercise of the powers conferred under Section 181 of the Electricity Act, 2003 (Act 36 of 2003).

The Commission has placed the above Discussion Paper on its website (www.gercin.org) for inviting suggestions / objections from stakeholders.

It is hereby notified that the persons who are interested in filing suggestions/objections may file the same with the Secretary, Gujarat Electricity Regulatory Commission, 6th Floor, GIFT ONE, Road 5-C, Zone-5, GIFT City, Gandhinagar – 382 050 along with supporting documents (if any) in five sets duly supported by an affidavit within 21 days from the date of this notice.

The public hearing on the objections / suggestions of the stakeholders will be held on **18/06/2026** at 11:30 AM at the Commission's Office in Hybrid mode i.e. the stakeholders have option either to appear in person or through Video Conferencing (VC) mode.

Sd/-
Ranjeeth Kumar J., IAS
Secretary, GERC

Place Gandhinagar
Date: 25/05/2026

Discussion Paper

DETERMINATION OF TARIFF FOR PROCUREMENT OF POWER BY DISTRIBUTION LICENSEES AND OTHERS FROM SMALL HYDRO POWER PROJECTS IN THE STATE OF GUJARAT

Order No. ____of 2026

Gujarat Electricity Regulatory Commission

6th Floor, GIFT ONE,
Road 5C, Zone 5, GIFT City,
Gandhinagar - 382355,
Gujarat

Contents

List of Figures

List of Tables

Abbreviations

%	Percentage
ABT	Availability-Based Tariff
AC	Alternating Current
AD	Accelerated Depreciation
AHEC	Alternate Hydro Energy Center, IIT Roorkee
APPC	Average Pooled Purchase Cost
CDM	Clean Development Mechanism
CEA	Central Electricity Authority
CERC	Central Electricity Regulatory Commission
CFA	Central Financial Assistance
CPP	Captive Power Producer
CSERC	Chhattisgarh State Electricity Regulatory Commission
CSS	Cross-Subsidy Surcharge
DPR	Detailed Project Report
E&M	Electro-Mechanical
EA	Electricity Act 2003
FY	Financial Year
GEDA	Gujarat Energy Development Agency
GERC	Gujarat Electricity Regulatory Commission
GETCO	Gujarat Energy Transmission Corporation Ltd.
GOG	Government of Gujarat
GOI	Government of India
IREDA	Indian Renewable Energy Development Agency
KERC	Karnataka Electricity Regulatory Commission
kW	Kilo Watt
kWh	Kilo Watt hours
MAT	Minimum Alternate Tax
MNRE	Ministry of New and Renewable Energy
MW	Mega Watt
MWh	Mega Watt hour
MYT	Multi Year Tariff
NAPCC	National Action Plan for Climate Change
NEP	National Electricity Policy
NTP	National Tariff Policy
NWRWSK	Narmada, Water Resources, Water Supply and Kalpsar Department
O&M	Operation and Maintenance
PDD	Project Design Document
PPA	Power Purchase Agreement
PSERC	Punjab State Electricity Regulatory Commission
PU	Per Unit (kWh)
RBI	Reserve Bank of India

RE	Renewable Energy
REC	Renewable Energy Certificate
ROE	Return on Equity
RPO	Renewable Purchase Obligation
SBI	State Bank of India
SERC	State Electricity Regulatory Commission
SHP	Small Hydro Power Project
SLDC	State Load Dispatch Centre
SSNNL	Sardar Sarovar Narmada Nigam Ltd
STU	State Transmission Utility
T&D	Transmission and Distribution
V	Volt
WACC	Weighted Average Cost of Capital
WDV	Written-down Value
WPI	Wholesale Price Index

1. Introduction

1.1. Background

The Gujarat Electricity Regulatory Commission (GERC or Commission) vide Order No.05 of 2016 dated 14.12.2016 had issued Order on Determination of tariff for procurement of power by Distribution Licensees and others from small, mini and micro hydro power projects and others Commercial issues for the State of Gujarat. The Control period of the Order No. 05 of 2016 was effective from the date of issue of order to 31.03.2019.

The Ministry of Power had notified the Electricity (Promoting Renewable Energy through Green Energy Open Access) Rules, 2022 on 6th June 2022 ("MoP Rules") outlining the policy and regulatory provisions for promotion of renewable sources of energy through Open Access. Further, the MoP Rules are effective from the date of its Notification.

The Commission also notes that the Order No. 05 of 2016 dated 14.12.2016 for small, mini and micro hydro power Project was having control period up to 31.03.2019 and thereafter no extension in control period of said order is granted. Therefore, in order to give effect to the provision of Green Energy Open Access Rules 2022 notified by Ministry of Power under the Electricity Act, 2003 and specifically when there was no tariff order of the Commission after 31.03.2019 with regard to determination of small, mini and micro hydro power Project, the Commission found it more appropriate to adopt the regulatory provisions outlined in MoP Green Energy Open Access Rules, 2022 and defined the Control Period of new tariff order to be made effective from 06.06.2022 i.e. from the date of notification of MoP Green Energy Open Access Rules 2022.

The small, mini and micro hydro power Projects commissioned during the intervening period from 31.03.2019 to 05.06.2022 shall be governed by the provisions of Order No. 05 of 2016 dated 14.12.2016. Accordingly, the Control period of Order No. 05 of 2016 dated 14.12.2016 shall be deemed to be extended up to 05.06.2022.

Accordingly, the Commission intends to provide clarity on the tariff framework for the

next Control Period effective from 05.06.2022 to 31.03.2031, for procurement of power generated from small, mini & micro hydro power Projects in the State of Gujarat by Distribution Licensees, under the powers conferred to it under Sections 61(h), 62(1) (a), and 86(1) (b) & (e) of the Electricity Act, 2003, and National Electricity Policy, 2005, and Tariff Policy, 2016.

The Commission presents this Discussion Paper as part of the regulatory process for Determination of Tariff for Procurement of Power by Distribution licensee and others from small, mini & micro hydro power projects and other commercial issues for the state of Gujarat for next Control Period based on comments received from stakeholders on this Discussion Paper.

The Commission duly considered the various provisions of the Statutory/Policy documents, while preparing the Discussion Paper on the proposed Tariff framework:

1.2. The Electricity Act, 2003

The following provisions of the Act provide the enabling legal framework for promotion of renewable sources of energy by the State Electricity Regulatory Commissions (SERCs):

1.2.1. The Section 62(1)(a) of the Act provides for determination of tariff for supply of electricity by a Generating Company to a distribution licensee as under:

"Supply of electricity by a generating company to a distribution licensee: Provided that the Appropriate Commission may, in case of shortage of supply of electricity, fix the minimum and maximum ceiling of tariff for sale or purchase of electricity in pursuance of an agreement, entered into between a generating company and a licensee or between licensees, for a period not exceeding one year to ensure reasonable prices of electricity;"

1.2.2. Section 61(h) of the Act provides that, while specifying the terms and conditions of determination of tariff, the Commission shall be guided by the objective of promotion of co-generation and generation of electricity from renewable sources of energy.

The Section 86 (1) (b) of the Act provides to regulate the procurement process of electricity by the distribution licensees as under:

"regulate electricity purchase and procurement process of distribution licensees including the price at which electricity shall be procured from the generating companies or licensees or from other sources through agreements for purchase of power for distribution and supply within the State;"

1.2.3. The Section 86 (1) (e) of the Act mandates promotion of co-generation and generation of electricity from renewable sources of energy:

"Promote co-generation and generation of electricity from renewable sources of energy by providing suitable measures for connectivity with the grid and sale of electricity to any person, and also specify, for purchase of electricity from such sources, a percentage of the total consumption of electricity in the area of a distribution licensee."

1.2.4. Section 3 (1) of the Act requires the Central Government to formulate, inter alia, the National Electricity Policy in consultation with the Central Electricity Authority (CEA) and State Governments for inter-alia, development of the renewable sources of energy. The provision is quoted below:

"*The Central Government shall, from time to time, prepare the National Electricity Policy and tariff policy, in consultation with the State Governments and the Authority for development of the power system based on optimal utilization of resources such as coal, natural gas, nuclear substances or materials, hydro and renewable sources of energy.*"

1.3. National Electricity Policy (NEP)

Clause 5.2.20 of the NEP stipulates the need for fully exploiting the feasible potential of non-conventional energy sources, as reproduced below:

*"**5.2.20** Feasible potential of non-conventional energy resources, mainly small hydro, and Solar and bio-mass would also need to be exploited fully to create additional power generation capacity. With a view to increase the overall share of non-conventional energy sources in the electricity mix, efforts will be made to encourage private sector participation through suitable promotional measures."*

Clause 5.6.1 of the Policy stipulates about the need for Technology Development and R&D on non-conventional energy systems, as reproduced below:

"Special efforts would be made for research, development demonstration and commercialization of non-conventional energy systems. Such systems would need to meet international standards, specifications and performance parameters."

Clause 5.12 stipulates several conditions for promotion and harnessing of renewable energy sources. The salient features of the said provisions of NEP are reproduced below.

***5.12.1** : Non-conventional sources of energy being the most environment-friendly, there is an urgent need to promote generation of electricity based on such sources of energy. For this purpose, efforts need to be made to reduce the capital cost of projects based on non-conventional and renewable sources of energy. Cost of energy can also be reduced by promoting competition within such projects. At the same time, adequate promotional measures would also have to be taken for development of technologies and a sustained growth of these sources.*

***5.12.2** : The Electricity Act, 2003, provides that co-generation and generation of electricity from non- conventional sources would be promoted by the SERCs by providing suitable measures for connectivity with the grid and sale of electricity to any person and also by specifying, for purchase of electricity from such sources, a percentage of the total consumption of electricity in the area of a distribution licensee. Such percentage for purchase of power from non-conventional sources should be made applicable for the tariffs to be determined by the SERCs at the earliest. Progressively, the share of electricity from non-conventional sources would need to be increased*

***5.12.3** As prescribed by State Electricity Regulatory Commissions. Such purchase by distribution companies shall be through competitive bidding process. Considering the fact that it will take some time before non-conventional technologies compete, in terms of cost, with conventional sources, the Commission may determine an appropriate differential in prices to promote these technologies.*

1.4. Tariff Policy-2016 (TP)

In compliance with the Section (3) of the Act, the Central Government has notified the revised Tariff Policy on 28 January, 2016. The Tariff Policy elaborates the role of

Regulatory Commissions, the mechanism for promoting renewable energy, the time-frame for implementation, etc. Clause 5.2 of the Tariff Policy provides as under:

"Provided also that the State Government can notify a policy to encourage investment in the State by allowing setting up of generating plants, including from renewable energy sources out of which a maximum of 35% of the installed capacity can be procured by the Distribution Licensees of that State for which the tariff may be determined under Section 62 of the Electricity Act, 2003."

Clause 6.4 of the Tariff Policy states about various aspects associated with promoting and harnessing renewable sources of energy generation including co-generation from renewable energy sources, as reproduced below:

1) "Pursuant to provisions of Section 86(1)(e) of the Act, the Appropriate Commission shall fix a minimum percentage of the total consumption of electricity in the area of a distribution licensee for purchase of energy from renewable energy sources, taking into account availability of such resources and its impact on retail tariffs. Cost of purchase of renewable energy shall be taken into account while determining tariff by SERCs. Long term growth trajectory of Renewable Purchase Obligations (RPOs) will be prescribed by the Ministry of Power in consultation with MNRE.

Provided that cogeneration from sources other than renewable sources shall not be excluded from the applicability of RPOs.

(i) Within the percentage so made applicable, to start with, the SERCs shall also reserve a minimum percentage for purchase of solar energy from the date of notification of this policy which shall be such that it reaches 8% of total consumption of energy, excluding Hydro Power, by March 2022 or as notified by the Central Government from time to time.

(ii) Distribution Licensee(s) shall compulsorily procure 100% power produced from all the Waste-to-Energy plants in the State, in the ratio of their procurement of power from all sources including their own, at the tariff determined by the Appropriate Commission under Section 62 of the Act.

(iii) It is desirable that purchase of energy from renewable sources of energy takes place more or less in the same proportion in different States. To achieve this objective in the current scenario of large availability of such resources only in certain parts of the country, an appropriate mechanism such as Renewable Energy Certificate (REC) would need to be promoted. Through such a mechanism, the renewable energy based generation companies can sell the electricity to local distribution licensee at the rates for conventional power and can recover the balance cost by selling certificates to other distribution companies and obligated entities enabling the latter to meet their renewable power purchase obligations. The REC mechanism should also have a solar specific REC.

(iv) Appropriate Commission may also provide for a suitable regulatory framework for encouraging such other emerging renewable energy technologies by prescribing separate technology based REC multiplier (i.e. granting higher or lower number of RECs to such emerging technologies for the same level of generation). Similarly, considering the change in prices of renewable energy technologies with passage of time, the Appropriate Commission may prescribe vintage based REC multiplier (i.e. granting higher or lower number of RECs for the same level of generation based on year of commissioning of plant).

2) States shall endeavor to procure power from renewable energy sources through competitive bidding to keep the tariff low, except from the waste to energy plants. Procurement of power by Distribution Licensee from renewable energy sources from projects above the notified capacity, shall be done through competitive bidding process, from the date to be notified by the Central Government.

However, till such notification, any such procurement of power from renewable energy sources projects, may be done under Section 62 of the Electricity Act, 2003. While determining the tariff from such sources, the Appropriate Commission shall take into account the solar radiation and Solar intensity which may differ from area to area to ensure that the benefits are passed on to the consumers.

3) The Central Commission should lay down guidelines for pricing intermittent power, especially from renewable energy sources, where such procurement is not through competitive bidding. The tariff stipulated by CERC shall act as a ceiling for that category.

4) In order to incentivize the Distribution Companies to procure power from renewable sources of energy, the Central Government may notify, from time to time, an appropriate bid-based tariff framework for renewable energy, allowing the tariff to be increased progressively in a back-loaded or any other manner in the public interest during the period of PPA, over the life cycle of such a generating plant. Correspondingly, the procurer of such bid-based renewable energy shall comply with the obligations for payment of tariff so determined.

5) In order to promote renewable energy sources, any generating company proposing to establish a coal/lignite based thermal generating station after a specified date shall be required to establish such renewable energy generating capacity or procure and supply renewable energy equivalent to such capacity, as may be prescribed by the Central Government from time to time after due consultation with stakeholders. The renewable energy produced by each generator may be bundled with its thermal generation for the purpose of sale. In case an obligated entity procures this renewable power, then the SERCs will consider the obligated entity to have met the Renewable Purchase Obligation (RPO) to the extent of power bought from such renewable energy generating stations.

6) Provided further that in case any existing coal and lignite based thermal power generating station, with the concurrence of power procurers under the existing Power Purchase Agreements, chooses to set up additional renewable energy generating capacity, the power from such plant shall be allowed to be bundled and tariff of such renewable energy shall be allowed to be pass through by the Appropriate Commission. The Obligated Entities who finally buy such power shall account towards their renewable purchase obligations.

7) Provided also that scheduling and despatch of such conventional and renewable generating plants shall be done separately.

8) In order to further encourage renewable sources of energy, no inter-State transmission charges and losses may be levied till such period as may be notified by the Central Government on transmission of the electricity generated from solar sources of energy through the inter-State transmission system for sale.

9) Appropriate Commission may provide regulatory framework to facilitate generation and sale of electricity from renewable energy sources particularly from roof-top solar system by any entity including local authority, Panchayat Institution, user institution, cooperative society, Non-Governmental Organization, franchisee or by Renewable Energy Service Company. The Appropriate Government may also provide complementary policy support for this purpose."

1.5. Gujarat Small Hydel Policy 2016

Government of Gujarat has notified the 'Small Hydel Policy 2016' on 28th March 2016 for development of small, mini, and micro hydel projects in the State. The operative period of the Gujarat Small Hydel Policy-2016 is extended by Government up to 31st March 2027 or till a new Policy is announced, whichever is earlier vide GR dated 09.04.2025.

Some important provisions of this Policy are listed below:

i. The operative period of this policy is five years from the date of notification of the policy.
ii. The classification of the hydel projects as per the policy is – up to 100 kW is Micro hydel, 100 kW to 2 MW (unit size of up to 1 MW) is Mini hydel and 2-25 MW (unit size up to 5 MW) is Small hydel projects.
iii. Any individual, company or corporate body or association or body of individuals will be eligible for setting up the projects for the purpose of self-consumption (captive use), third parry sale or sale to obligated entities to meet their Renewable Purchase Obligation (RPO).
iv. The developer may select suitable site after consultation of concerned authorities and prepare the Detailed Project Report (DPR) taking into account the detailed study of past record of availability of water from the reservoir / canal and feasibility of the site. Afterwards, he can submit the proposal to the concerned agency for allotment and the allotment will be done as per the relevant provisions of the Gujarat Infrastructure Development Act, 1999.
v. Alternatively, Narmada, Water Resources, Water Supply & Kalpsar Department or such other Government Department may identify suitable sites, prepare DPR and offer the same to the developers through competitive bidding process.

vi. Gujarat Energy Development Agency (GEDA) shall be the nodal agency for implementation of the project. All projects should be registered with GEDA.

vii. Interconnection voltage should be governed by Gujarat Electricity Grid Code-2013 and GERC orders.

viii. The evacuation facility shall be approved by GETCO / DISCOM after conducting the system studies. The developer shall establish the dedicated transmission lines for evacuation up to nearest GETCO substation/ DISCOM network at their own cost. ABT compliant meter is required to be installed at interface points.

ix. Obligated entities may purchase power to fulfil their RPO at the tariff determined by GERC or rate determined through competitive bidding.

x. Upon entering the PPA, the developer shall require to furnish the bank guarantee of Rs 5 lakh per MW or part thereof.

xi. The open access charges have been specified in the policy.

xii. Electricity generated from SHP projects is exempted from payment of Electricity Duty in case of captive and third party sale. Exemption is given from demand cut to the extent of 50% of installed capacity of SHP project in case of captive and third party sale within the state.

xiii. The release of water in canals shall be controlled by Narmada, Water Resources, Water Supply & Kalpsar Department or SSNNL, as the case may be, and the availability of canal water for hydro-electricity generation shall be solely incidental to the requirement of water for drinking, irrigation etc. The developer shall have no right to claim release of water for the purpose of hydel generation

1.6. GERC (Terms and Conditions for Green Energy Open Access) Regulations, 2024.

The Commission has notified the GERC (Terms and Conditions for Green Energy Open Access) Regulations, 2024. While notifying the present tariff framework, the Commission has also considered the provisions of GERC (Terms and Conditions for Green Energy Open Access) Regulations, 2024. The GERC (Terms and Conditions for Green Energy Open Access) Regulations, 2024 stipulates various provisions related to grant of Open Access from Green Energy Generating Projects for consumption of green energy for captive use as well as purchase of green energy from third party

generators including provisions related to energy banking facility, banking charges, energy settlement mechanism, applicability of various open access charges, etc.

1.7. Renewable Purchase Obligation in Gujarat

The Gujarat Electricity Regulatory Commission (Procurement of Energy from Renewable Sources) Regulations, 2025, dated 12 August, 2025 has specified the minimum renewable power purchase by the obligated entities for the financial year (FY) 2024-25 to 2029-30 as shown in Table No. 1.1 below.

Table 1.1 Renewable purchase obligation in Gujarat for FY 2024-25 to 2029-30

Minimum Quantum of Purchase (in %) from Renewable Energy Sources (in terms of energy in kWh) of total consumption					
Year	Wind Renewable Energy	Hydro Renewable Energy	Distributed Renewable Energy	Other Renewable Energy	Total Renewable Energy
2024-25	0.67%	0.38%	1.50%	27.35%	29.91%
2025-26	1.45%	1.22%	2.10%	28.24%	33.01%
2026-27	1.97%	1.34%	2.70%	29.94%	35.95%
2027-28	2.45%	1.42%	3.30%	31.64%	38.81%
2028-29	2.95%	1.42%	3.90%	33.10%	41.36%
2029-30	3.48%	1.33%	4.50%	34.02%	43.33%

As per these regulations, the obligated entities have the obligation to purchase electricity (in kWh) from specified RE sources. The said purchase shall be at a defined minimum percentage of the total consumption of its consumers including T&D losses during a year.

This renewable purchase obligation applies to:

- distribution licensees; and
- any other captive and open-access users consuming electricity (i) generated from conventional captive generating plant having capacity of 5 MW and above for their own use and/or (ii) procured from conventional generation through open access and third-party sale.

Further this Regulations specifies renewable energy consumption targets shall be met either directly or through Certificate in accordance with the Central Electricity Regulatory Commission (Terms and Conditions for Renewable Energy Certificates for Renewable Energy Generation) Regulations, 2022, published in the Gazette of India, Extraordinary, Part III, Section 4, dated 24th May, 2022.

1.8. Small, Mini and Micro Hydro Tariff Order in Other States

The prevailing small, mini and micro hydro power tariffs in different states are tabulated in Table No. 1.2 below. The Central Electricity Regulatory Commission (CERC) in accordance with provisions under its RE Tariff Regulations 2024 has determined SHP Tariff for the second year of the control period (FY 2025-26). CERC in its tariff order dated 09.07.2025 has calculated a single part tariff for two groups of states (first group – hilly and north-eastern states, second group – other states) by considering the geographical locations of the projects. The tariff has been specified by CERC separately for below 5 MW capacity SHP projects and 5-25 MW capacity of SHP projects.

The Madhya Pradesh Electricity Regulatory Commission (MPERC) also provides single part tariff for small, mini and micro hydro power projects set up in the state of Madhya Pradesh. MERC has decided the small hydro power (SHP) project tariff for 1-5 MW capacity of projects and 5-25 MW capacity of projects separately. Similarly, Odissa Electricity Regulatory Commission (OERC) & Chattisgrah State Electricity Regulatory Commission (CSERC) specifies tariff separately for below 5MW capacity of projects and between 5-25 MW capacities of projects.

Table 1.2 Comparison of SHP project tariff

CERC SUO-MOTU RE Tariff Order (09.07.2025)	MPERC SHP Tariff Order (20.02.2025)	OERC SUO-MOTU RE Tariff Order (04.12.2023)	CSERC RE Tariff Order (15.05.2024)	KERC RE Tariff Order (24.07.2024)
1. **Himachal Pradesh, Uttarakhand, West Bengal, Union**	**below 5 MW**: – Rs 5.76/KWh,	**below 5 MW**: – Rs 5.93/ KWh	**below 5 MW**: – Rs 7.05/kWh	

CERC SUO-MOTU RE Tariff Order (09.07.2025)	MPERC SHP Tariff Order (20.02.2025)	OERC SUO-MOTU RE Tariff Order (04.12.2023)	CSERC RE Tariff Order (15.05.2024)	KERC RE Tariff Order (24.07.2024)
territory of Ladakh, Union territory of Jammu and Kashmir and North Eastern States: (**below 5 MW)** – Rs 6.58/ KWh (**5MW-25 MW**) – Rs 5.95/KWh 2. **<u>For Other states</u>: (below 5 MW)** – Rs 7.57/kWh **(5-25 MW)** – Rs 7.42/KWh	**5-25 MW:** Rs 5.63/KWh	**5-25 MW:** Rs 5.82/ KWh	**5-25 MW:** Rs 6.33/KWh	**Up to 25 MW** – Rs 5.25/kWh

1.9. GERC SHP Tariff Order 2016

The GERC, in its Order No. 05/2016 dated 14th December 2016 has determined generic tariff for procurement of power by Distribution Licensees and others from small, mini and micro hydel projects in the state of Gujarat. The tariff for procurement of power by Distribution Licensees and others from small, mini and micro hydel projects in the state of Gujarat was determined in conformity with the provisions under the Electricity Act, 2003, guidelines of the National Electricity Policy, 2005, Tariff Policy, 2016 and Gujarat Small Hydel Policy 2016. The Commission vide Order No. 05/2016 dated 14th December 2016 had specified levelized tariff of Rs 4.32/ KWh for small, mini and micro hydel projects up to 5 MW capacity and a specified levelized tariff of Rs 3.64/ KWh for small, mini and micro hydel projects from 5 to 25 MW capacity.

1.10. Small, Mini and Micro Hydel Project Development in Gujarat

The installed capacity of small, mini and micro hydel power projects in Gujarat is 113.30 MW as on 30 November 2025. The potential and achievement of SHP projects in the State of Gujarat is given in the table below.

Table 1.3 Potential and installed SHP project capacity in Gujarat as on 31 December 2025

Potentials Capacity (MW)	Installed Capacity (MW)
201.97	113.30

(Source: Ministry of New and Renewable Energy (MNRE)

:: End of Chapter 1::

2. SHP Potential in Gujarat

2.1. Geography

Gujarat state is situated on the west coast of India. The state has an area of 1,96,024 sq. km., the seventh largest state in terms of area in India. While the sea encircles the state right from the southern parts to the extreme north in the peninsula, the state mostly consists of plain land interspersed with low hills or small mountains extending from Rajasthan, Madhya Pradesh, and Maharashtra. Aravalli ranges are extended from Rajasthan and in the east there is Satpura hills. Aravalli ranges forms the Pavagadh region, near Baroda and merges itself with the Vindhyas. The state has mainly three geographical regions - the mainland; the peninsular region of Saurashtra and the Kutch region, which has a large area of desert land, known as Rann of Kutch. The mainland has black and fertile soil and alluvial soil. The Saurashtra soils formed of deccan lava and in Kutch we find alluvial sandy soil.

Narmada, Sabarmati, Mahi, Tapi are the main rivers. Sabarmati has its origin in Dhebar Lake in Rajasthan. The state's biggest city Ahmedabad is situated on the bank of this river. It has several tributaries like the Hathmati, Vatrak and Meshwo. Mahi and Narmada originated from Madhya Pradesh. Mahi has several tributaries like Bhadar, Anas, Panam and Meshro and Narmada has only one tributary namely the Karjan. The famous city Surat is located on the bank of river Tapi. Apart from this there are rivers like Hirni, Kapila, Ojhat, the Kamb and Surekh in the Gir forest area, Brahmani, Machchu in Kutch are. The rivers in the Kutch area flowing north disappear into desert and those flowing southwards fall into the sea. The state has a long coastline of over 1,600 km.

Stream flow constitutes the principal source of fresh water in Gujarat. River flows are concentrated in the relatively short monsoon season. There are 17 rivers in Gujarat mainland, 71 in Saurashtra and 97 in Kutch region. Narmada, Tapi and Purna are perennial rivers.

2.2. Water Resources

The main source of water for Gujarat is surface water. The State has 185 river basins and the available quota of water in the State is 55608 million cubic meters, out of which,

38100 million cubic meters is surface water, which is only 2% of the entire quota of surface water of the country. Moreover, the available quota of surface water is also not distributed properly. Gujarat, Saurashtra and Kutch have water resources of 89%, 9% and 2% respectively, against this, the total geographical area of these regions is 45%, 31% and 24% respectively. The underground water resources of State are 17508 million cubic meters.

2.3. Canal Network and Command Area

The canal network in the state of Gujarat can be divided into (a) Canals in Gujarat (b) Canals in Kachchh Region (c) Canals in Saurashtra Region (d) Canals of Sardar Sarovar Narmada River

Table 2.1 Canals in Gujarat

Ukai	Umariya	Aedalwada
Kelia	Khambhda	Kabutri
Kadana	Karjan	Kakdiamba
Guhai	Chopadvav	Juj
Jojwa Wadhvan	Doswada	Damanganga
Dantiwada	Dev	Dharoi
Dholi	Patadungri	Panam
Pigut	Mukteshvar	Waidy
Ver-2	Harnav-1	Harnav-2
Heran	Vasna berej	Baldeva
Bhadar(5)	Machannala -1	Mahi(Vipar)
Mazam	Meshwo	Rami
Pigut	Mukteshvar	Waidy
Ver-2	Harnav-1	Harnav-2
Heran	Vasna berej	Baldeva
Bhadar(5)	Machannala -1	Mahi(Vipar)
Mazam	Meshwo	Rami
Lakhigam	Watrak	Vakleshvar-Bhe
Saraswati berej	Sipu	Sukhi
Hadaf	Hathmati	

Table 2.2 Canals in Kachchh Region

Kalaghogha	Kasawati	Godhatad
Don	Gajod	Jangdiya
Tapar	Niruna	Nara

Fategadh	Berachia	Mathal
Sannadro	Suvi	Miti
Kalaghogha	Kasawati	Godhatad
Don	Gajod	Jangdiya
Tapar	Niruna	Nara

Table 2.3 Canals in Saurashtra Region

Kankavati	Bhadar	Shetrunji
Ambajal	Aji-2	Aji-3
Ishwariya	Und-1	Und-2
Uben(PW)	Uben	Ozat(PW)
Karmal	Kalindri	Kalubhar
Kharo	Khodiyar	Goma
Gondli	Ghelo(Itarya)	Ghelo(PW)
Ghelo(Somnath)	Chaprwadi(Lunivav)	Chaprwadi(Jetpur)
Dai-minsar	Dhatarwadi	Ghi
Dhrafad	Nyari-2	Puna
Fulku	Fulgar-1	Fulgar-2
Phophal-2	Bagad	Brumhani
Bhimdad	Bhogavo-1	Bhogavo-2
Machchu-1	Machchu-2	Machchundri
Machchundri-2	Madhuvanti	Malgadh
Malan	Munjiyasar	Moj
Motisar	Rangmati	Ranghola
Rajaval	Raydi	Raval-2
Raval(pw)	Rojki	Lakhanka
Limbali	Limbdi bhogavo	Vadia
Vartu	Venu-2	Shingoda
Sapda	Sasoi	Sani
Sankroli	Sukhbhadar	Surajwadi
Sonmati	Sorthi	Hamirpra
Hiren-1	Hiren-2	Demi-2
Demi-1		

2.4. SHP Potential in the State

The MNRE official website indicates SHP potential in the Gujarat State as 201.97 MW which includes the SHP schemes identified by the government agencies as well as private developers.

As reported by Sardar Sarovar Narmada Nigam Ltd (SSNNL) the total estimated potential of small, mini and micro hydro power projects on Narmada branch canals, is around 105.71 MW. SSNNL has already installed and commissioned SHP projects of capacity of 85.46 MW on 18 locations of various branch canals. The details of SHP schemes being developed by SSNNL is provided in Table below. Besides these schemes, SSNNL has estimated an additional potential of hydro power development of 6 MW (2X3 MW) at Garudeshwar weir and 4 MW (2X2 MW) at Sabarmati escape hydro project.

Table 2.4 SHP projects identified for development by SSNNL

Sr. No	Name of the Branch Canal	Potential (MW)	Installed / Commissioned capacity (MW)
1.	Miyagam Branch Canal	13.37	12.00
2.	Vadodara Branch Canal	12.00	5.15
3.	Saurashtra Branch Canal	48.34	45.00
4.	Kachchh Branch Canal	20.00	23.31
5.	Mandava	0.33	
6.	Amleshwar	0.38	
7.	Luwara	0.78	
8.	Vehlal	0.44	
9.	Dholka	6.25	
10.	Sanand	0.38	
11.	Goriya	0.35	
12.	Kharaghoda	0.34	
13.	Zinduwada	3.35	
14.	Rajpura	0.40	
	Total	**105.71**	**85.46**

2.5. SHP Technology option (Type of SHP Schemes)

Small Hydro Power Projects can be broadly categorized in two types as: small hydro power projects in the hills, where small streams are exploited for power generation and small hydro projects in the other areas where water regulated for other purpose is utilized. The projects in the hills are mostly medium / high head project with low discharge. The water is diverted by weir/ diversion / barrage and intake is conveyed to the forebay using head race channel / tunnel pipe which has penstock intake. Thereafter

penstock conveys the water to the turbine kept in the powerhouse building to generate electricity. These projects may be further categorized as run-of-river schemes with or without diurnal storage.

Projects in the other regions utilize the water regulated for other purposes like irrigation, drinking water or small dam. These projects are low head project with availability of large discharge. These projects can be further categorized as canal-based projects and dam toe based projects.

2.6. Run-of-River Projects

In run-of-river projects water is diverted from a stream without creating any storage in the river. In these projects power is generated from flowing water and available head defined as difference in elevation from diversion to tailrace. The output of a run-of-river project is subject to the instantaneous flow in the stream.

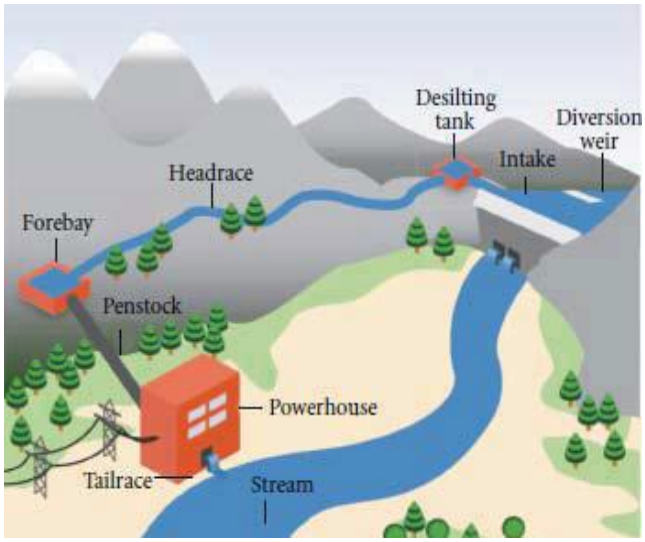

Figure 6.1:Run-of-river scheme

2.7. Canal based Projects

Canal based hydro power project are planned to generate electricity by using the fall available in the canal / barrage and flow in the canal. These schemes can be planned in the canal itself or in the bypass channel.

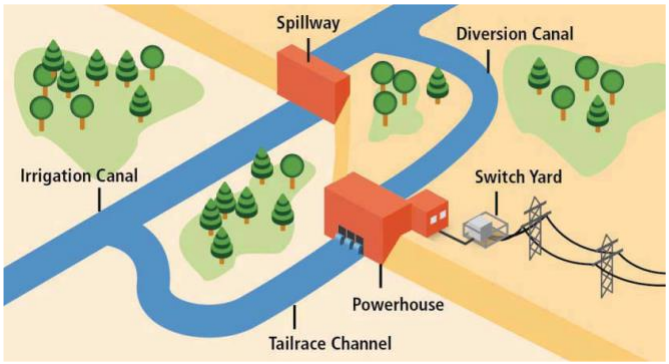

Figure 7.1: Canal based project

2.8. Dam Toe based Project

The dam-based project can be developed by utilizing the water from the dam storage. Water is stored in the river by constructing a dam across the river and power is generated from the controlled water available from the dam. In dam toe project intake system forms the part of the main dam. Water is conveyed to the turbine through penstock installed directly through the body of the dam.

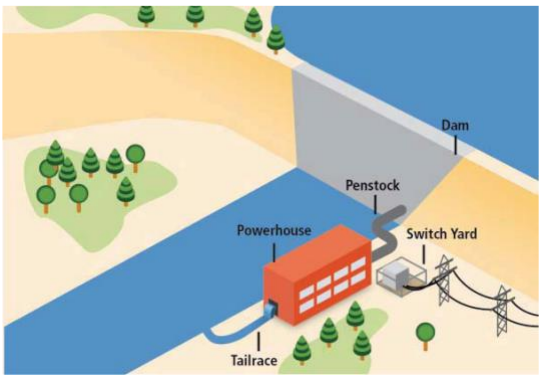

Figure 8.1:Dam toe based project

:: End of Chapter 2 ::

3. Computation of Tariff for Small Hydro Power Projects

3.1. Approach and Methodology

3.1.1 The Commission notes that the revised Tariff Policy notified by the Central Government on 28 January 2016 in pursuance of the Section 3 of the Act has stipulated that the Appropriate Commission may determine preferential tariff for procurement of power by distribution licensees from non-conventional sources of energy till issue of notification for procurement of power from renewable energy sources through competitive bidding by Central Government. The relevant extract of para 6.4 of the Tariff Policy is given below.

"..... (2) States shall endeavor to procure power from renewable energy sources through competitive bidding to keep the tariff low, except from the waste to energy plants. Procurement of power by Distribution Licensee from renewable energy sources from projects above the notified capacity shall be done through competitive bidding process, from the date to be notified by the Central Government.

However, till such notification, any such procurement of power from renewable energy sources projects, may be done under Section 62 of the Electricity Act, 2003. While determining the tariff from such sources, the Appropriate Commission shall take into account the solar radiation and wind intensity which may differ from area to area to ensure that the benefits are passed on to the consumers.

(3) The Central Commission should lay down guidelines for pricing intermittent power, especially from renewable energy sources, where such procurement is not through competitive bidding. The tariff stipulated by CERC shall act as a ceiling for that category."

3.1.2 In view of above, the Commission proposes to determine the tariff for procurement of electricity from Small, Mini & Micro hydro power projects on cost-plus basis.

3.2. General Principles

In this section, the general principles for small hydro power project tariff determination such as control period, tariff period, tariff structure, tariff design, plant life, etc., has been discussed.

3.2.1. Control period: Control period of the tariff order under discussion is proposed to be 06.06.2022 to 31.03.2031

3.2.2. Useful life of plant: The CERC in its RE Tariff Regulations 2024 and all other SERCs have considered project life of 40 years for small hydro power projects. In view of above, it is proposed to consider 40 years as useful life for the small hydro power projects for tariff determination purpose.

3.2.3. Tariff period: The tariff period for the tariff determined by the Commission for procurement of electricity from small hydro power projects by the distribution licensees in the state will be 40 years.

3.2.4. Tariff Design: The tariff for Small, mini and micro hydro power projects shall be a Single Part Tariff consisting of the following fixed cost components:

(a) Capital Cost;

(b) Return on equity;

(c) Interest on loan capital;

(d) Depreciation;

(e) Interest on working capital;

(f) Operation and maintenance expenses

3.2.5. Tariff Structure: The tariff shall be determined on a levelized basis for the Tariff Period of the project. For the purpose of levelized tariff computation, a discount factor equivalent to the post-tax weighted average cost of capital shall be considered.

3.2.6. Eligibility criteria: The small hydro power projects lower than or equal to 25 MW installed capacity (SHP can be further sub-categorised as Micro (up to 100 KW) and Mini (101KW to 2000 KW) hydel project) using new plant and machinery and commissioned during the control period of new tariff order shall

be eligible to sell power to distribution licensees of Gujarat at tariff determined by the Commission in the new tariff order .

3.2.7. Scheduling of power: Small hydro power projects are proposed to be not covered under the ambit of Intra-state ABT order / Regulations notified by the Commission during the next control period. Therefore, no scheduling is required from the small hydro power projects.

3.2.8. Applicability of merit order despatch principle: Small hydro power projects shall be treated as 'MUST RUN' power projects and shall not be subjected to 'merit order despatch' principles.

3.2.9. Metering point and interconnection point: The interconnection point will be at the line isolator on outgoing feeder on HV side of generator transformer and the metering point will be at the interconnection point of the generator bus-bar with the transmission or distribution system concerned, as the case may be.

3.2.10. Subsidy or incentive by the Central/State Government: The Commission while calculating the tariff shall take into account any incentive or subsidy offered by the Central and State Government, including the accelerated depreciation (AD) benefit if availed by the small hydro power projects.

3.3. Benchmarking of Capital Cost and Other Performance Parameters

3.3.1. Benchmarking of the Capital Cost

The capital cost is one of the most important parameters deciding the SHP tariff. The cost of a small hydro projects is site specific and depend on the terrain conditions and layout of SHP scheme (Run of river, dam toe based, canal-based scheme). In a cost-plus approach, the benchmark capital cost fixed for tariff determination needs to be representative of the type of SHP schemes to be developed in future. The study of geography of Gujarat and the type of identified potential SHP sites for development in future reveal that most of the future SHP projects are going to be developed on the irrigation canal utilizing the discharge and gradient of canal. Therefore, the benchmark capital cost to be fixed for generic SHP tariff determination purpose needs to be representative of such type of projects/ scheme.

Major component of Capital Cost in low head SHP scheme

Cost of civil work: The cost of civil work in a SHP project includes cost of intake structure, water conductor system and power house building, machine foundation, and tailrace channel. The cost of civil work associated with the power house station building largely depends on the head. Higher head needs less expensive power house building. For same installed capacity, the physical size of the power house building and cost tends to be on higher side in a low head SHP scheme, when compared to high head SHP scheme.

Cost of Electromechanical work: The cost of E&M equipment is determined by the operating head on the hydraulic plant and selection of turbine type to optimize the generation. As the head falls, not only the size of the runner diameter increases but also cost of generator increases due to reduction in shaft speed. The cost of electro - mechanical equipment includes cost of turbine, generator, valves, control system switchyard, and other accessories but excluding cost of transmission line.

Cost of power evacuation line: The cost of power evacuation line includes the evacuation line cost and evacuation infrastructure up to inter-connection point.

3.3.1.1. Capital Cost under Regulatory Approach

The Commission has examined the approach followed by the CERC and other State Electricity Regulatory Commissions in the Renewable Energy Tariff Regulations / recent tariff orders notified by them. The capital cost of SHP projects approved by CERC and other SERCs under the regulatory approach are presented in the table below:

Table No. 3.1.1. Capital Cost of SHP projects considered by CERC and other SERCs

Name of ERC	FY	Capital cost of SHP (Cr/MW)	
		Below 5 MW	5-25 MW
CERC	2024-25	**8.90**	**10.27**
OERC	2023-24	7.80	9.00
JERC- Goa & Uts	2024-25	8.90	10.27
CSERC	2022-23	9.70	8.82

MPERC	2024-25	8.2	8.01

The Commission noted that the CERC and most of other SERCs have specified separate capital costs for SHP projects below 5MW capacity and 5-25 MW station capacity. The average Capital cost for SHP projects up to 5 MW capacity comes to Rs 8.7 Cr/MW and for SHP projects of 5MW to 25 MW capacity arrive at Rs 9.27 Cr/MW under the Regulatory approach.

3.3.1.2. Capital Cost based on projects set up in Gujarat

Sardar Sarovar Narmada Nigam Ltd (SSNNL) owns SHP projects of total 85.46 MW capacity on various locations of Saurashtra, Kachchh, Miyagam and Vadodara Branch Canals in Gujarat. It has been reported that the energy generated from these SHP projects is being utilized for meeting the captive power requirement of SSNNL pumping schemes on various branch canal. The actual / approved Capital cost data of the SHP projects commissioned during year 2019 to 2025 provided by SSNNL is presented in the following table:

Table 3.1 :Capital Cost of SHP projects considered by SSNNL

Name of Canal	SHP Location	Installed capacity (MW)	Total Project Capacity (MW)	Year of Commissioning	Actual Capital Cost (Rs Cr)	Capital cost/MW (Rs Cr)
Saurashtra Branch Canal	Siyapura	15	3 X 15 = 45	2018	411.14	9.14
	Khavad	15		2019		
	Nani kumud	15		2024		
Kachchh Branch Canal	Beda	3 X 3.33	7 X 3.33 = 23.31	2020	240.42	10.31
	Kilana	2X 3.33		2020		
	Madhutra	2X3.33		2025		
Miyagam Branch canal	Fatna	3X0.75	16X0.75=12	2021	141.99	11.83
	Dormar	2X0.75		2021		
	Bhulvan	2X0.75		2018		
	Fatana	3X0.75		2022		
	Bhulvan	3X0.75		2022		

	Manjrol	3X0.75		2022		
Vadodara Branch Canal	Guntal	1.05	5.15	2019	82.50Cr	16.02
	Sanoli	0.7		2022		
	Raval	0.702		2019		
	Nimeta	0.6		2019		
	Murlipura	1.5		2022		
	Kumetha	0.6		2019		

The actual capital cost data submitted by SSNNL reveal that the Capital cost of the completed SHP projects is inversely proportional to the installed capacity ie the capital cost of SHP project tends to increase as the capacity of project get decrease. The reported capital cost of SHP project up to 1 MW installed capacity is substantially high and cannot be considered as representative case for generic tariff determination. It has been observed that the average capital cost of 3 numbers of SHP projects , each of 15 MW capacity planned on Saurashtra Branch Canal is around Rs 9.14 Cr/MW and that of 7 numbers of SHP projects, each of 3.33 MW Capacity planned on Kachchh Branch is around 10.31 Cr/MW .

3.3.1.3. Escalation of Capital Cost

In order to know the inflation in cost from end of last control period, the Commission has examined the indices like the manufacturing Index, wholesale price index, and infrastructure industry index, over FY 2019-20 to FY 2024-25 . Accordingly, the Commission has computed the escalation factor to be applied on the approved Capital cost in previous tariff order (Order No. 05/2016 dated 14th December 2016). This will help in normalise and compare the regulated capital costs over the specified period.

The tabulated data depicts the growth rates of these indices over FY 2019-20 to FY 2024-25.

Table 3.1 Growth in Indexation for Capital Cost

Parameters	FY 2019-20	FY 2020-21	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	Growth % from 2019-2025
Manufacturing Index	129.6	117.2	131.0	137.1	144.7	150.6	16.20%

Wholesale Price Index	121.8	123.4	139.4	152.5	151.4	154.9	27.18%
Infrastructure Industry Index	129	123.2	136.1	146.7	157.8	164.9	27.83%
Average Escalation Factor					-	-	**23.74%**

Source: National Statistical Office, GoI, Office of the Economic Adviser, Ministry of Commerce, and industry, GoI

Based on the average escalation factor as derived in above table, the Capital cost for SHP projects approved in previous tariff order for control period 2016 to 2019 (order no 05/2016 dated 14th December 2016) is escalated to arrive at capital cost benchmark for FY 2025-26 as given below:

Particulars	**Up to 5 MW**	**5MW-25 MW**
Capital cost (Rs Cr/MW) approved in Tariff order no 05/2016 dated 14th December 2016 for control period of 2016-2019)	8.20	7.28
Capital cost proposed (Rs Cr/MW) for new control period	10.15	9.01

Based on analysis carried out in para 3.3.1.1, 3.3.1.2 & 3.3.1.3, and considering the type of future potential SHP schemes to be developed in the state, the Capital cost for SHP projects arrived through the indexation method considering average growth rate from end of previous control period seems to be appropriate to be considered as a representative cost for the new control period.

Hence the Commission propose to fix the bench mark capital cost of Rs 10.15 Cr/MW for SHP projects up to 5 MW capacity and Rs 9.01 Cr/MW for SHP projects between 5MW-25 MW capacities for tariff determination purpose during the new control period.

3.3.2. Operations and maintenance Expenses

Operations and Maintenance (O&M) cost consists of the statutory charges, spares, employee cost, administrative and general expense, consumables, repairs and maintenance, and insurance expenses, etc. The Commission observed that the CERC / SERCs specify the O&M expenses in terms of Rs lakh/MW or in terms of percentage (%) of Capital cost as given below:

Table 3.2 O&M expenses for SHP projects considered by SERCs

CERC (Other states) July 2025	OERC Dec 2023	JERC of Goa & Other UTs	CSERC May 2024	MPERC Feb 2025
Below 5 MW: 39.66 Rs. Lacs/MW 5-25 MW: 28.72 Rs. Lacs/MW	Below 5 MW: 37.68 Rs. Lacs/MW 5-25 MW: 27.29 Rs. Lacs/MW	Below 5 MW:.39.66 Rs lacs /MW 5-25 MW: 28.72 Rs Lacs/MW	Up to 5 MW – 41.74Rs. Lacs/MW 5-10 MW –35.41 Rs. Lacs/MW , 10-25 MW – 30.23 Rs. Lacs/MW	Below 5 MW: 3% of Capital Cost 5-25 MW: 3% of Capital cost

The Commission in Tariff Order No 05 of 2016 had considered the O&M charges as 3.3 % of capital cost for SHP projects up to 5 MW capacity and 2.5% of capital cost for SHP projects of 5 MW to 25 MW capacity. The O&M charges as fixed above shall be escalated @ 5.72% per annum from second year onwards. The Commission proposes to consider O&M charges as 3.5 % of capital cost for SHP projects up to 5 MW capacity and 2.5% of capital cost for SHP projects of 5 MW to 25 MW capacity with an annual escalation rate of 5.72% for tariff determination purpose during control period of new tariff order.

3.3.3. Capacity Utilization Factor

It is imperative that the Normative Capacity Utilization Factor (CUF) fixed for generic tariff determination shall be representative of the type of SHP schemes going to be developed in the state in the control period of new tariff order.

The Commission observed that there is ample scope for canal-based SHP project development in the state. The canal network in the state of Gujarat mainly constitutes of (a) Canals on West flowing rivers (b) Canals in Kachchh Region (c) Canals in Saurashtra Region (d) Canals of Sardar Sarovar, Narmada River. The Narmada water resource

department, and SSNL are responsible for releasing the water in the canal as per the crop water requirement and demand received from the command area. It has been observed that the water is being released from the dams in canal on seasonal basis to cater the need of Kharif, Rabbi, hot weather crops , and some time perennial crops.

The Commission has examined the actual historical energy generation data of the SHP plants operated by SSNNL which are set up on various canals in the state. It has been noted that some of SHP plant set up on Saurashtra Branch canal have achieved CUF in the range of 34% to 39% during year 2020- 2025.

3.3.3.1. IIT Roorkee Study

Alternate Hydro Energy Centre (AHEC), IIT Roorkee under MNRE sponsored study titled "Benchmark cost for Small and Large Hydropower Projects" has reported that they have collated the data from 76 operating SHP projects in the country wherein the CUF variance is in the range of 17% to 61%. The State –wise CUF achieved as reported in the study report are shown in following table:

Table 3.3 State –wise CUF achieved by SHP Power Projects

Arunachal Pradesh	Chhattisgarh	HP	Kar	MH	Telangana	MP	Punjab	Odisha	AP
61%	20%	48%	31%	51%	38%	41%	52%	47%	30%

3.3.3.2. Under the Regulatory approach, the SERCs of various states have fixed the normative CUF for Tariff determination purpose as given in the following table:

Table 3.4 Normative CUF considered by SERCs for SHP Power Projects

CERC (Other states)	OERC	JERC Goa	CSERC	MPERC
30%	45%	30%	30%	30%

The Commission observed that the CUF of the SHP projects planned in north and north east states are comparatively on higher side due to perennial rivers

Considering all above aspects, it is proposed to fix the normative CUF of 40% for tariff determination purpose.

3.3.4. Auxiliary consumption:

The Commission in Tariff order no 05/2016 dated 14th December 2016 has considered Auxiliary consumption as 1% of the gross generation for tariff determination purpose. CERC as well as most of the SERCs in their tariff orders for small hydro power projects considered Auxiliary consumption as 1% of gross generation.

The Commission proposes to consider auxiliary consumption as 1% of gross energy generation for tariff determination purpose during control period of new tariff order.

3.4. Financial Parameters

3.4.1. Debt-equity ratio

GERC Multi Year Tariff (MYT) Regulations 2024 provide the normative debt-equity ratio of 70:30 for Generating Company/Licensees. The Commission proposes to consider the debt-equity ratio as 70:30 for tariff determination purpose for control period of in new tariff order.

3.4.2. Loan Tenure

The Commission has proposed loan repayment period as 15 years for tariff determination purpose

3.4.3. Interest on term loan:

The Commission has noted that the project financing interest rates are typically indicated by SBI MCLR. A reasonably sound project could avail funding at 200 basis points above the MCLR announced by State Bank of India (SBI). It is proposed to consider the interest rate on term loan as SBI MCLR rate (8.70%) plus 200 basis points which works out to 10.70 % for computation of interest on term loan and loan repayment period as 15 years for tariff determination purpose.

3.4.4. Rate of depreciation

GERC Multi Year Tariff (MYT) Regulations, 2024 notified by the Commission provide that depreciation rate should be calculated based on Straight Line Method. The MYT Regulations further provide that asset is to be depreciated up to 90% of its initial value (considering residual value as 10% of its initial value) over the entire asset life. To facilitate the principal loan repayment, the Commission decides to consider the

depreciation rate as 4.67% per annum during the loan repayment period i.e. first 15 years; and beyond the loan tenure, the depreciation is allowed as per 'Straight Line Method' over the remaining useful life of the plant i.e. depreciation at rate of 0.8% per annum from 16th to 40th year.

In view of this it is proposes to consider depreciation at the rate of 4.67% per annum for the first 15 years, and 0.8% from 16th year to 40th year for tariff determination purpose during the control period of new tariff order.

3.4.5. Working capital

The Commission propose to consider the components of working capital as given below:

1) O&M expenses for one month.
2) Receivables of one-month charges for sale of electricity.

It is proposed to consider the above components as the part of working capital for determination of tariff of small hydro power projects during control period of new tariff order.

3.4.6. Interest on working capital:

GERC MYT Regulations 2024, states that the interest on working capital is to be calculated at 250 basis points above the base rate / MCLR. In view of the above, it is proposed to consider the interest on working capital equal to the SBI MCLR plus 250 basis points, which works out as 11.20 % for tariff determination purpose during control period of new tariff order.

3.4.7. Return on Equity

GERC Multi Year Tariff Regulations, 2024, the Commission follows the principle of allowing 15.5% RoE for generating plants plus the applicable tax payment for conventional and renewable power projects. It is proposed to consider the ROE of 15.5% and the tax payment of MAT @ 17.47 % per annum for first 10 years and corporate tax @ 34.94% (IT Rate 30% + 12% Surcharge + 4% Cess) per annum for the next 30 years for tariff determination purpose during control period of new tariff order.

3.4.8. Discount rate:

The discount rate has been considered by other SERCs as weighted average cost of capital (WACC). The formula for computation of WACC is given below.

WACC = Cost of Debt + Cost of Equity

Cost of Debt =0.70 x (Rate of Interest) x (1- Corporate tax)

Cost of Equity = 0.30 x Return on Equity (i.e., normative 15.5%)

Where,

Cost of Debt (For first 10 Years) =0.70 x (Market Rate of Interest) x (1- MAT)

Cost of Debt (11th Year to 40th Year) =0.70 x (Market Rate of Interest) x (1- Corporate tax)

Cost of Equity = 0.30 x Return on Equity (i.e. 15.5%)

Resulting WACC = {(WACC For first 10 Years X 10) + (WACC 11th Year to 40th Year X 10)}/ (10 + 30)

Cost of Debt (For first 10 Years) = 0.70 x 10.70% x (1- 17.47%) = 6.18%

Cost of Debt (11th Year to 40th Year) = 0.70 x 10.70% x (1- 34.94%) = 4.87%

Cost of Equity = 0.30 x 15.5% = 4.65%

Interest Rate considered for the loan component (i.e., 70% of the capital cost) is 10.70 %. For the equity component (i.e., 30% of the capital cost), the rate of Return on Equity (ROE) is considered at a post-tax rate of 15.5%, as a normative factor. Further, Corporate Tax rate of 34.94% has been considered.

In view of above, the Commission proposes to consider the discount factor as 9.85% for levellized tariff calculation during the control period of new tariff order.

3.4.9. Incentives for small hydro power projects: The incentives available for small hydro power projects are as follows:

3.4.9.1. Accelerated depreciation:

Following principles have been considered for ascertaining the Income Tax benefit on account of accelerated or additional depreciation for the purpose of tariff determination:

i. The assessment of benefit shall be based on normative Capital Cost, accelerated and additional depreciation rate as per the relevant provisions of the Income Tax Act and the Corporate Income Tax rate;

ii. Capitalisation of RE Projects for the full financial year;

iii. Per-unit benefit shall be derived on levelized basis at a discounting factor equivalent to the post-tax weighted average cost of capital.

Presently, small hydro power project owners can avail accelerated depreciation at the rate of 40% in the first year on a written-down value (WDV) basis. In addition to this 40% depreciation, the amendment in the Finance Act has allowed an additional depreciation of 20% to the power projects during first year of project commissioning. With this, the small hydro power projects can avail 60% depreciation in the first year of commissioning. The Commission has considered the above depreciation rate while calculating per unit AD benefit.

3.4.9.2. Central Financial Assistance (CFA)

The Commission generally shall take into consideration any grant / subsidy offered by the Central or State Government or their agencies, particularly Central Financial Assistance (CFA) from MNRE, if availed, while determining the tariff for small hydro power projects.

The Commission noted that at present there is no existing scheme/ program in the MNRE to provide financial support for setting up of new SHP/MHP projects during FY 2025-2026.

In view of above, while determining the present tariff the Commission has not considered availing of any such benefit like grant / subsidy. The State Nodal Agency, GEDA shall inform the distribution utility regarding any such grant /subsidy received by a project developer. Further that such grant /subsidy, if availed by a project developer, shall be deducted by the distribution utility / GUVNL in subsequent bills raised by the particular project developer towards sale of electricity in suitable instalments or within such period as may be stipulated by the Commission.

3.5. Computation of Tariff for Small Hydro Power Projects

Based on the foregoing discussion, the operational and financial parameters considered by the Commission for determination of tariff of SHP projects during the control period of new tariff order are provided in the table below:

Parameters	Proposed for next control period	
	Below 5 MW	5 – 25 MW
Project Cost		

Parameters	Proposed for next control period	
	Below 5 MW	5 – 25 MW
Total Project Cost (Land + Plant & Machinery + Erection Cost + Evacuation Infrastructure Cost up to GETCO Sub-station) (Rs. Lakh/MW)	1015	901
Normative O&M Cost for first year (% of project cost)	3.5 %	2.5%
Escalation in O&M (per annum from 2nd year)	5.72%	5.72%
Performance Parameters		
CUF	40%	40%
Auxiliary Consumption	1%	1%
Project Life in Years	40	40
Financial Parameters		
Debt-Equity ratio	70:30	70:30
Term of Loan in Years	15	15
Interest on Term Loan	10.70%	10.70%
Interest on Working Capital	11.20%	11.20%
Depreciation	4.67% (for first 15 years) 0.80% (from 16 to 40 years)	4.67% (for first 15 years) 0.80% (from 16 to 40 years)
Minimum Alternate Tax	17.47%	17.47%
Corporate Income Tax	34.94%	34.94%
Return on Equity	15.50%	15.50%
Tariff	Gross Tariff – Rs 5.87 / kWh AD benefit – Rs 0.42/ kWh Net Tariff – Rs 5.45 / kWh	Gross Tariff – Rs 4.71 / kWh AD benefit – Rs 0.38/ kWh Net Tariff – Rs 4.33 / kWh

The detailed tariff calculations for small hydro power projects are enclosed in Annexure I and II

:: End of Chapter 3::

4. Other Commercial Issues

4.1. Transmission and Wheeling Charges

Wheeling of Power for Third Party Sale

a. In case of injection of the electricity at 66 KV level or above and drawl of electricity up to 66 KV level, the transmission of energy from the injection point to drawl place shall be allowed by paying transmission charges and losses determined by the Commission from time to time, as applicable to Green Energy Open Access Transaction as per GERC Green Energy Open Access Regulations, 2024 and amendments in it from time to time.

b. In case of injection of energy at 66 KV level or above and drawl of energy below 66 KV voltage level in such case, wheeling of Power for third party sale from SHP Projects shall be allowed on payment of transmission charges, transmission losses and wheeling charges and losses as determined by the Commission from time to time as applicable to green energy open access transaction as per GERC (Green Energy Open Access) Regulations, 2024 and amendments in it from time to time.

c. In case point of injection and drawl at 11 KV or below levels lies within area of same DISCOM, the wheeling of energy from SHP shall be allowed upon payment of Wheeling Charges and Wheeling Losses of energy fed to grid, as applicable to green energy open access transaction as per GERC (Green Energy Open Access) Regulations, 2024 and amendments in it from time to time.

d. The Commission decides to promote the third-party sale /consumption of SHP Energy by allowing 25% concession in the Cross Subsidy Surcharge and Additional Surcharge wherein the RE generator and consumer does not claim RE attribute and allow distribution licensee to avail the same for RPO compliance. No concession in the Cross Subsidy Surcharge shall be allowed to the Wind generator who are selling power under third party sale and utilizing RE attribute for RPO

compliance of the consumer or the projects are registered under REC mechanism. They shall be liable to pay 100% Cross Subsidy Surcharge and Additional Surcharge, if any, as determined by the Commission read with the provisions of GERC Green Energy Open Access Regulations.

e. The provisions related to Cross Subsidy Surcharge and Additional Surcharge shall be governed as per the MOP Rules and GERC (Green Energy Open Access) Regulations, 2024 as amended from time to time.

Wheeling of power for Captive Use

a. In case of injection of the electricity at 66 KV level or above and drawl of electricity up to 66 KV level, the transmission of energy from SHP Projects from the injection point to drawl place shall be allowed for captive use by paying transmission charges and losses determined by the Commission from time to time, as applicable to Green Energy Open Access Transaction as per GERC (Green Energy Open Access) Regulations, 2024 and amendments in it from time to time.

b. In case of injection of energy at 66 KV level or above and drawl of energy below 66 KV voltage level in such case, wheeling of Power for captive from SHP Projects shall be allowed on payment of transmission charges, transmission losses and wheeling charges and losses as determined by the Commission from time to time as applicable to green energy open access transaction as per GERC (Green Energy Open Access) Regulations, 2024 and amendments in it from time to time.

c. In case point of injection and drawl at 11 KV or below levels lies within area of same DISCOM, the wheeling of energy for captive use from SHP Project shall be allowed upon payment of Wheeling Charges and Wheeling Losses of energy fed to grid, as applicable to green energy open access transaction as per GERC (Green Energy Open Access)Regulations, 2024 and amendments in it from time to time.

Provided further that the person consuming energy generated from SHP project set up for captive consumption shall require to provide the details of ownership in the captive generating plant and generation as well as consumption of energy from captive generating plant to the distribution licensee in whose area of supply, the captive consumer is situated, on annual basis, in accordance with the provisions of GERC (Green Energy Open Access) Regulations, 2024 to ensure that the necessary conditions stipulated in Electricity Rules, 2005 read with provisions of GERC (Green Energy Open Access)Regulations, 2024 is fulfilled by such captive generating plant and consumption by captive users. Failure to fulfil the aforesaid conditions, such consumption shall loose the status of captive consumption and it shall be qualified as supply by third party by generator and the benefits granted to captive consumption shall be withdrawn for that Financial Year and it shall attract the applicability of the Cross-Subsidy Surcharge and Additional Surcharge, if any, as applicable to third party green energy open access transaction as per GERC (Green Energy Open Access) Regulations, 2024 and amendments in it from time to time along with delayed payment surcharge thereon.

On receiving of documents/evidence from the captive consumer by the distribution licensee, the distribution licensee shall verify the same in compliance of provisions of Act, Rules and Regulations for captive status of the generator and consumption of energy from such plant and refer the matter to the Commission in case non-compliance of captive status by the generator/captive consumer and also claim the recovery of charges payable by such consumer on account of not fulfilling of captive generating plant status by the generator or captive consumer.

The Commission shall verify the fact and take the final decision regarding continuation of the captive status of the plant and consumption of energy from such plant as captive consumption for the respective financial year.

The various provisions related to Captive Generating Plant (CGP) and consumption of energy from such plant as stipulated in the GERC (Green Energy Open Access) Regulations, 2024 shall be applicable for SHP Project.

Wheeling of power to more than one locations

Small Hydro Power Projects owners, who decide to wheel electricity for captive use / third party sale, to more than one location, shall pay 5 Paisa/kWh on energy fed into the grid to the distribution company concerned in whose area power is consumed in addition to above mentioned transmission charges and losses, as applicable.

4.2. Metering Point & Interconnection Point

The Commission proposes following with regard to Metering arrangement:

- The interconnection point will be at the line isolator on outgoing feeder on HV side of generator transformer and the metering point will be at the interconnection point of the generator bus-bar with the transmission or distribution system concerned, as the case may be. The SHP project shall provide energy metering and communication facility in accordance with the (a) the CEA (Installation and Operation of meters) (Amendment) Regulations 2014 and its subsequent amendments, (b) Gujarat Electricity Grid Code 2013 and its subsequent amendments (c) GERC (Terms and Conditions of Intra-State Open Access) Regulations, 2011 and its subsequent amendments,(d) GERC Distribution Code, 2004 and its subsequent amendments and (e) GERC Green Open Access Regulations, 2024 and its subsequent amendments.

- The SHP project developers shall have to provide four quadrant ABT compliant meters at the interconnection point which shall conform to the Central Electricity Authority (Installation and Operation of Meters) Regulations, 2014, as amended from time to time. GETCO/DISCOM to stipulate necessary specifications in this regard. The ABT meter shall be AMR compatible.

- The electricity generated shall be metered and readings taken jointly by the SHP project developer with the representative of DISCOM and GETCO at the metering point, on monthly basis.

- The SHP project shall install Remote Terminal Unit (RTU) at the sending end sub-station at their own cost for transferring the real time data to SLDC for its monitoring purpose, and in accordance with the GERC Orders from time to time.

- State Load Dispatch Centre shall certify actual injected energy and energy drawn (if any) from local DISCOM.

- Energy metering and communication facility shall be provided by the developer of Small Hydro Power Projects in accordance with the following Regulations/Codes/Orders and their subsequent amendments:

i. Central Electricity Authority (Installation and Operation of meters) Regulations 2014 and its subsequent amendments.
ii. Gujarat Electricity Grid Code 2013 and its subsequent amendments.
iii. GERC (Terms and Conditions of Intra-State Open Access) Regulations, 2011 and its subsequent amendments.
iv. GERC Distribution Code 2004 and its subsequent amendments.
v. GERC (Terms and Conditions for Green Energy Open Access), Regulations 2024.

For the purpose of energy accounting, all SHP generators shall have to provide ABT compliant (four quadrant) meters and if the power is to be wheeled to consumers' premises, then ABT cum Tariff compatible meter is to be installed at the consumers' premises also. While in case of consumer seeking open access below 1 MW, installation of Special Energy Meter capable of energy recording on 15 Minute Time Block basis at consumption end shall be allowed. GEDA, GETCO and DISCOMs shall ensure the energy accounting of Active and Reactive energy from the SHP project consumer/customer. Energy Accounting shall be done by SLDC.

4.3. Renewable Energy Certificates for Third-Party Sale and Captive Use of power generated from Small Hydro Power Projects

The Commission proposes that the small hydro power projects registered in the REC mechanism, shall be governed by the CERC (REC) Regulations and its amendments from time to time to be eligible for availing RECs.

4.4. Pricing of Reactive Power

Reactive Power is required by the SHP project from the grid including during requirement initial start-up and station transformers. Hence, in order to maintain grid stability, it is necessary to limit such reactive power consumption from the grid by installation of suitable compensation devices. In order to restrain the Small Hydro power projects from consuming more reactive power from the grid and to encourage them to install suitable compensation devices to limit such reactive power consumption, the Commission in the previous Order had levied reactive power charges.

The Pricing of Reactive Power for all prospective SHP project shall be same as decided by the Commission in the GETCO Order from time to time read with GERC Grid Code.

4.5. Sharing of Clean Development Mechanism (CDM) Benefits

It is proposed that the sharing of CDM benefits or any other benefit such as carbon credit or any other benefits under Clean Development Mechanism or any other mechanism under any provision from any source providing such benefits to the SHP project for which it shall qualify to receive such benefit on the energy generation from the SHP project shall apply to the concerned authority to avail / receive the benefit for the project. The benefits which shall be receivable or received shall be shared with the procurer of power and / or licensee as under:

1) 100% of the gross proceeds on account of such CDM benefit or any other benefit under Clean Energy Mechanism from any source to be retained by the project Developer in the first year after the date of commercial operation of the generating station.

2) In the second year, the share of the beneficiaries like power procurer/licensee shall be 10% which shall be progressively increased by 10% every year till it

reaches 50%, where after the proceeds shall be shared in equal proportion, by the Generating Company and the Beneficiaries like power procurer/licensee."

3) In case of PPA signed under competitive bidding process, the sharing of benefits received by the SHP project shall be as per terms and conditions of bid documents read with the PPA.

The above approach is proposed to be adopted for all prospective SHP projects

4.6. Banking Facility and Energy Accounting

The provisions related to Banking facility and charges, methodology for settlement of banked energy and treatment for un-utilized banked energy at the end of banking period etc., shall be governed by the MoP's Green Energy Open Access Rules, 2022 and GERC (Terms and Conditions for Green Energy Open Access) Regulations, 2024 and its subsequent amendments from time to time.

The banking facility shall be an optional facility provided to the consumers availing open access from SHP Project as provided under GERC (Terms and Conditions for Green Energy Open Access) Regulations, 2024. In case consumer choose not to avail banking facility, the same shall be permitted on furnishing an undertaking as specified in the GERC (Terms and Conditions for Green Energy Open Access) Regulations, 2024.

Provided that in respect of SHP Project directly connected with ISTS network and supplying power to the consumer in the State either connected with ISTS network or Intra-State network of State, the provisions related to energy banking facility shall be governed as per the applicable CERC Regulations read with MoP Rules.

Provided further that the applicable charges i.e. transmission charges and losses, wheeling charges and losses, Cross Subsidy Surcharge, Additional Surcharge, if any, etc. shall be applicable to the consumer which are availing Open Access by utilization of State Grid as per the provisions of this Order i.e. Transmission and /or Distribution network of the State with or without utilization of ISTS Network. Provided also that Cross Subsidy Surcharge, Additional Surcharge, if any, etc. shall be applicable to the

consumer which are availing Open Access from SHP Project utilizing ISTS Network only.

Energy Accounting

Energy Accounting related provision as provided below, shall be applicable for captive use as well as third party open access transaction for SHP Projects:

Case 1 - SHP Projects which are availing banking facility: The consumption of banked energy shall be permitted on billing cycle basis in a manner stipulated in the GERC (Terms and Conditions for Green Energy Open Access) Regulations, 2024. The banking of energy shall be evaluated for energy accounting on 15-minute time block basis. The difference between the injected energy from SHP Project worked out at the receiving end sub-station of GETCO and available at consumption point and consumer's consumption in same 15-minute time block basis shall be considered as banked energy.

i. The permitted quantum of banked energy for the consumer availing open access from SHP project shall be at least 30% of total consumption of electricity from the distribution licensee by the consumer during the billing period as provided in the MoP Green Energy Open Access Rules, 2022 read with GERC (Terms and Conditions for Green Energy Open Access) Regulations, 2024.
ii. For net import of power, DISCOM shall charge applicable tariff of respective category to the Consumer including fixed/ demand charge, energy charges, peak charge, other charges/ penalty etc. as applicable to other Consumers.
iii. The unutilized surplus banked energy shall be considered as lapsed at the end of billing cycle and entitled to get REC as per the provisions of MoP Green Energy Open Access Rules, 2022.
iv. No carry forward of surplus banked energy, if any, available at the end of billing cycle shall be permitted.
v. The consumer/project developer shall require to pay banking charges as specified in the Green Energy Open Access Rules notified by the Ministry of Power, Government of India read with provisions of GERC (Terms and

Conditions for Green Energy Open Access) Regulations, 2024 and as amended from time to time.

vi. The consumer/project developers not desire to utilize the Green Energy attributes (RE) for fulfilment of its RPO, the distribution licensee shall have considered such energy as fulfilment of different types of RPO of distribution licensee, based on such energy consumed by consumer.

vii. The consumer who utilizes RE (Green Energy) component for fulfilment of its RPO, in such case, consumption of RE (Green Energy) shall be qualified as fulfilment of consumer's RPO.

Case 2: For SHP Projects not availing banking facility

i. The Energy accounting shall be based on a 15-minutes time block-basis and no banking charge shall be applicable. For net import of energy, the DISCOM shall charge applicable tariff of respective category of the consumer including fixed/ demand charge, energy charges, peak charge, time of use charges, other charges/ penalty, etc. as applicable to other Consumers as per tariff orders of the Commission.

ii. Surplus energy from SHP plant, after giving set-off on 15 minutes time block basis, shall be considered as lapsed energy and not entitled for REC.

iii. Once the option for not availing the banking facility is exercised, the same shall not be allowed to change before completion of three years from the date of exercise of such option.

Case 3: Project registered under REC Mechanism

i. SHP Projects availing open access for captive use/third-party sale under REC mechanism shall be governed as per CERC REC Regulations.

ii. Such projects shall be allowed to transmit / wheel the energy on payment of applicable transmission charges & losses, wheeling charges & losses and other charges as applicable to Green Energy Open Access transaction as per GERC (Terms and Conditions for Green Energy Open Access) Regulations, 2024.

iii. The provisions related to banking facility and charges, energy accounting mechanism, treatment for surplus energy etc. shall be governed as per the GERC (Green Energy Open Access)Regulations as amended from time to time.

Cross Subsidy Surcharge and Additional Surcharge, if any, and open access charges shall be applicable as applicable to green energy open access transactions as per GERC (Terms and Conditions for Green Energy Open Access) Regulations, 2024 as amended from time to time

4.7. Security Deposit

The Commission proposes that the Small hydro Power project developers are required to furnish Bank Guarantee of Rs. 10 Lakh/MW as a security deposit after entering into PPA with Distribution Licensees. The Bank Guarantee shall be returned if the developer achieves commercial operation within the time period mentioned in the PPA. The Bank Guarantee shall be encashed if the project is not commissioned within the specified time period as stipulated in the PPA.

Stakeholders may offer their comments on or before XX 2026. Public hearing in this regard will held on XX 2026 at 11:30 AM at GERC office GIFT CITY Gandhinagar. Stakeholder either in person or through their authorized representative may remain present.

Sd/-
RANJEETH KUMAR J., IAS
Secretary
GERC

Place: Gandhinagar

Date: 25/05/2026

:: End of Chapter 4::

Annexure I

Tariff for small hydro power projects (Below 5 MW)

Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Net Energy sold (lakh kWhs)	34.69	34.69	34.69	34.69	34.69	34.69	34.69	34.69	34.69	34.69
Costs (Rs lakh)										
O&M	35.53	37.56	39.71	41.98	44.38	46.92	49.60	52.44	55.44	58.61
Depreciation	47.40	47.40	47.40	47.40	47.40	47.40	47.40	47.40	47.40	47.40
Interest on term loan	73.49	68.42	63.35	58.28	53.22	48.15	43.08	38.01	32.94	27.88
Interest on working capital	2.33	2.32	2.31	2.31	2.31	2.31	2.31	2.32	2.32	2.34
Return on Equity	47.20	47.20	47.20	47.20	47.20	47.20	47.20	47.20	47.20	47.20
Tax on equity	8.25	8.25	8.25	8.25	8.25	8.25	8.25	8.25	8.25	8.25
Fixed cost (Rs lakh)	**214.19**	**211.14**	**208.22**	**205.41**	**202.74**	**200.21**	**197.83**	**195.61**	**193.55**	**191.66**
Tariff										
Tariff (Rs / kWh)	**6.17**	**6.09**	**6.00**	**5.92**	**5.84**	**5.77**	**5.70**	**5.64**	**5.58**	**5.53**

Year	11	12	13	14	15	16	17	18	19	20
Net Energy sold (lakh kWhs)	34.69	34.69	34.69	34.69	34.69	34.69	34.69	34.69	34.69	34.69
Costs (Rs lakh)										
O&M	61.96	65.50	69.25	73.21	77.40	81.83	86.51	91.45	96.69	102.22
Depreciation	47.40	47.40	47.40	47.40	47.40	8.10	8.10	8.10	8.10	8.10
Interest on term loan	22.81	17.74	12.67	7.60	2.53	0.00	0.00	0.00	0.00	0.00
Interest on working capital	2.43	2.45	2.47	2.50	2.53	2.22	2.31	2.40	2.50	2.60
Return on Equity	47.20	47.20	47.20	47.20	47.20	47.20	47.20	47.20	47.20	47.20
Tax on equity	16.49	16.49	16.49	16.49	16.49	16.49	16.49	16.49	16.49	16.49
Fixed cost (Rs lakh)	**198.28**	**196.78**	**195.48**	**194.40**	**193.55**	**155.83**	**160.60**	**165.64**	**170.97**	**176.61**
Tariff										
Tariff (Rs / kWh)	**5.72**	**5.67**	**5.64**	**5.60**	**5.58**	**4.49**	**4.63**	**4.77**	**4.93**	**5.09**

Year	21	22	23	24	25	26	27	28	29	30
Net Energy sold (lakh kWhs)	34.69	34.69	34.69	34.69	34.69	34.69	34.69	34.69	34.69	34.69
Costs (Rs lakh)										
O&M	108.06	114.24	120.78	127.69	134.99	142.71	150.88	159.51	168.63	178.28
Depreciation	8.10	8.10	8.10	8.10	8.10	8.10	8.10	8.10	8.10	8.10
Interest on term loan	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working capital	2.71	2.83	2.95	3.08	3.22	3.37	3.52	3.68	3.85	4.04
Return on Equity	47.20	47.20	47.20	47.20	47.20	47.20	47.20	47.20	47.20	47.20
Tax on equity	16.49	16.49	16.49	16.49	16.49	16.49	16.49	16.49	16.49	16.49
Fixed cost (Rs lakh)	**182.56**	**188.86**	**195.52**	**202.56**	**210.00**	**217.87**	**226.18**	**234.98**	**244.27**	**254.10**
Tariff										
Tariff (Rs / kWh)	**5.26**	**5.44**	**5.64**	**5.84**	**6.05**	**6.28**	**6.52**	**6.77**	**7.04**	**7.32**

Year	31	32	33	34	35	36	37	38	39	40
Net Energy sold (lakh kWhs)	34.69	34.69	34.69	34.69	34.69	34.69	34.69	34.69	34.69	34.69
Costs (Rs lakh)										
O&M	188.47	199.25	210.65	222.70	235.44	248.91	263.14	278.19	294.11	310.93
Depreciation	8.10	8.10	8.10	8.10	8.10	8.10	8.10	8.10	8.10	8.10
Interest on term loan	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working capital	4.23	4.43	4.65	4.87	5.11	5.37	5.63	5.92	6.22	6.54
Return on Equity	47.20	47.20	47.20	47.20	47.20	47.20	47.20	47.20	47.20	47.20
Tax on equity	16.49	16.49	16.49	16.49	16.49	16.49	16.49	16.49	16.49	16.49
Fixed cost (Rs lakh)	**264.49**	**275.47**	**287.08**	**299.36**	**312.34**	**326.06**	**340.57**	**355.90**	**372.11**	**389.25**
Tariff										
Tariff (Rs / kWh)	**7.62**	**7.94**	**8.28**	**8.63**	**9.00**	**9.40**	**9.82**	**10.26**	**10.73**	**11.22**

Tariff:

Levelized Tariff	Tariff in Rs./kWh
Gross tariff (1 to 40 years)	5.87
AD Benefit	0.42
Net tariff (1 to 40 years)	5.45

Annexure II

Tariff for small hydro power projects (5 - 25 MW)

Year	1	2	3	4	5	6	7	8	9	10
Net Energy sold (lakh kWhs)	34.69	34.69	34.69	34.69	34.69	34.69	34.69	34.69	34.69	34.69
Costs (Rs lakh)										
O&M	22.53	23.81	25.18	26.62	28.14	29.75	31.45	33.25	35.15	37.16
Depreciation	42.08	42.08	42.08	42.08	42.08	42.08	42.08	42.08	42.08	42.08
Interest on term loan	65.24	60.74	56.24	51.74	47.24	42.74	38.24	33.74	29.24	24.74
Interest on working capital	1.88	1.86	1.85	1.83	1.82	1.81	1.80	1.79	1.78	1.78
Return on Equity	41.90	41.90	41.90	41.90	41.90	41.90	41.90	41.90	41.90	41.90
Tax on equity	7.32	7.32	7.32	7.32	7.32	7.32	7.32	7.32	7.32	7.32
Fixed cost (Rs lakh)	**180.93**	**177.71**	**174.55**	**171.48**	**168.49**	**165.59**	**162.78**	**160.07**	**157.47**	**154.97**
Tariff										
Tariff (Rs / kWh)	**5.22**	**5.12**	**5.03**	**4.94**	**4.86**	**4.77**	**4.69**	**4.61**	**4.54**	**4.47**

Year	11	12	13	14	15	16	17	18	19	20
Net Energy sold (lakh kWhs)	34.69	34.69	34.69	34.69	34.69	34.69	34.69	34.69	34.69	34.69
Costs (Rs lakh)										
O&M	39.29	41.53	43.91	46.42	49.08	51.88	54.85	57.99	61.30	64.81
Depreciation	42.08	42.08	42.08	42.08	42.08	7.19	7.19	7.19	7.19	7.19
Interest on term loan	20.25	15.75	11.25	6.75	2.25	0.00	0.00	0.00	0.00	0.00
Interest on working capital	1.84	1.84	1.84	1.85	1.86	1.56	1.62	1.68	1.74	1.80
Return on Equity	41.90	41.90	41.90	41.90	41.90	41.90	41.90	41.90	41.90	41.90
Tax on equity	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64
Fixed cost (Rs lakh)	**159.99**	**157.73**	**155.61**	**153.63**	**151.79**	**117.17**	**120.19**	**123.39**	**126.77**	**130.34**
Tariff										
Tariff (Rs / kWh)	**4.61**	**4.55**	**4.49**	**4.43**	**4.38**	**3.38**	**3.46**	**3.56**	**3.65**	**3.76**

Year	21	22	23	24	25	26	27	28	29	30
Net Energy sold (lakh kWhs)	34.69	34.69	34.69	34.69	34.69	34.69	34.69	34.69	34.69	34.69
Costs (Rs lakh)										
O&M	68.52	72.44	76.58	80.96	85.59	90.49	95.66	101.14	106.92	113.04
Depreciation	7.19	7.19	7.19	7.19	7.19	7.19	7.19	7.19	7.19	7.19
Interest on term loan	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working capital	1.87	1.95	2.02	2.11	2.19	2.28	2.38	2.48	2.59	2.70
Return on Equity	41.90	41.90	41.90	41.90	41.90	41.90	41.90	41.90	41.90	41.90
Tax on equity	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64
Fixed cost (Rs lakh)	**134.12**	**138.11**	**142.33**	**146.79**	**151.51**	**156.50**	**161.77**	**167.34**	**173.24**	**179.47**
Tariff										
Tariff (Rs / kWh)	**3.87**	**3.98**	**4.10**	**4.23**	**4.37**	**4.51**	**4.66**	**4.82**	**4.99**	**5.17**

Year	31	32	33	34	35	36	37	38	39	40
Net Energy sold (lakh kWhs)	34.69	34.69	34.69	34.69	34.69	34.69	34.69	34.69	34.69	34.69
Costs (Rs lakh)										
O&M	119.50	126.34	133.57	141.21	149.28	157.82	166.85	176.39	186.48	197.15
Depreciation	7.19	7.19	7.19	7.19	7.19	7.19	7.19	7.19	7.19	7.19
Interest on term loan	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working capital	2.83	2.95	3.09	3.23	3.38	3.54	3.71	3.89	4.08	4.27
Return on Equity	41.90	41.90	41.90	41.90	41.90	41.90	41.90	41.90	41.90	41.90
Tax on equity	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64
Fixed cost (Rs lakh)	**186.05**	**193.02**	**200.38**	**208.16**	**216.39**	**225.09**	**234.28**	**244.00**	**254.28**	**265.15**
Tariff										
Tariff (Rs / kWh)	**5.36**	**5.56**	**5.78**	**6.00**	**6.24**	**6.49**	**6.75**	**7.03**	**7.33**	**7.64**

Tariff:

Levelized Tariff	Tariff in Rs./kWh
Gross tariff (1 to 40 years)	4.71
AD Benefit	0.38
Net tariff (1 to 40 years)	4.33