MINUTES OF THE 57TH MEETING OF THE FOIR GOVERNING BODY

Venue: India Habitat Centre
Lodhi Road
New Delhi

Date/Day: Tuesday, 23rd July 2024

List of participants: **Annexure 1**

1. At the outset, Hony Vice-Chairperson of FOIR and Chairperson, CERC, Shri Jishnu Barua, welcomed the Governing Body Members to the 57th Governing Body Meeting. He informed the members about the agenda at hand, which prominently included the Report of the FOIR Working Group on Inter-Regulator Cooperation, headed by Shri Arun Goyal, Hony Secretary, FOIR / Member, CERC. He also thanked Shri Goyal and Chairperson, TNERC, who were attending their last meeting in official capacity before their superannuation, for their contributions to the Forum and wished them all the best for their future.

2. In his opening remarks, Hony Chairperson, FOIR and Chairperson, IBBI, Shri Ravi Mital, welcomed all the members to the meeting. Amongst the agenda items, he spelled special emphasis to the presentation by the Inter-Regulator Working Group on the Comparative Study on Tariff Determination Principles. Concluding his remarks, he requested the FOIR Secretariat to proceed with the agenda items.

AGENDA ITEM 1 - CONFIRMATION OF MINUTES OF 56TH GOVERNING BODY MEETING

3. Members were updated on actions taken based on the minutes of the 56th GBM. After discussion, the GB members approved the minutes.

AGENDA ITEM 2: CHANGE OF ADDRESS OF FORUM OF INDIAN REGULATORS

4. Joint Chief (Regulatory Affairs), CERC briefed the GB about the change of address of CERC from its Janpath address to the World Trade Centre at Nauroji Nagar. Consequently, the resolution presenting the change of address for FOIR was put forward for approval.

5. The GBM approved the resolution.

AGENDA ITEM 3: FOIR WORKING GROUP REPORT ON INTER-REGULATOR COOPERATION

6. Shri Arun Goyal, Chairperson of Inter-Regulator Cooperation & Hony Secretary, FOIR & Member, CERC, made a presentation (**Annexure 2**) on the Working Group's Report (**Annexure 3**). At the beginning of the presentation, he broadly outlined the flow of the presentation:
    - Part A: Compilation of Best Practices
    - Part B: Comparative Study of Tariff Setting Principles
    - Part C: Scope of Inter-Regulator Cooperation

7. At the outset, Shri Goyal briefed the GBM on the genesis of the Working Group (WG), including its Formation, Members, Terms of Reference, and the meetings conducted.

8. Shri Goyal highlighted that the WG had undertaken the task of compiling the best practices of member regulators (Reference Part A of the Report). Responses to this request were received from UPERC, TAMP, AERA, CERC, IBBI, PNGRB, TRAI, CCI, TNERC, WBERC, and MERC. Among the notable practices highlighted were the Unified Tariff for Natural Gas Pipelines – One Nation, One Grid, One Tariff (PNGRB), the TRAI apps MySpeed and MyCall (TRAI), and the E-Court System (CERC & MERC). It was emphasized that certain best practices, such as the Periodic Organizational/Institutional Evaluation by IBBI, the Light Touch Regulatory Approach by AERA, and the E-Court System at CERC, could be effectively adopted by all regulators.

9. Shri Goyal mentioned that, for the comparison of tariff-setting principles (Reference Part B of the Report), four regulators were identified: CERC, AERA, PNGRB, and TAMP (before 2021). Comparison of the following tariff components, was undertaken:
    - Return on Equity (RoE) / Capital Employed (RoCE)
    - Cost of debt
    - Depreciation (including project life and method used)
    - Interest on Working Capital (WC)
    - Operations & Maintenance (O&M) Expenditure (major components; inflation indexation)

10. Following that, Mr. Goyal proceeded to present Part C, addressing the Scope of Inter-Regulator Cooperation. The submissions on this made by UPERC, TAMP, AERA, CERC, PNGRB, TRAI, and TNERC were compiled and presented. Notably, during the WG meetings, multiple regulators highlighted their ongoing cooperation with NHAI, prompting an invitation for NHAI to present their perspective. Subsequently, NHAI joined the 3rd Meeting of the Working Group, offering valuable input on the extent and potential of such collaborations. Mr. Goyal concluded the presentation by outlining the Way Forward.

11. In the discussion that followed, Shri Sudhaker Shukla, Hony. Member FOIR & Member, IBBI, suggested conducting more analysis, including a review of the Tariff Study, focusing on its pros and cons.

12. Shri S.K.G. Rahate, Hony Vice-Chairperson of FOIR and Chairperson of AERA, praised the efforts put forth by the group and noted that through this activity, AERA has identified various avenues for cooperation. Chairperson, CERC endorsed the report and emphasized the importance of Regulatory Impact Assessment, suggesting that CERC is seriously considering this approach. Shri Anoop Singh, Professor at IIT Kanpur, also voiced his views on such aspects.

13. Shri Ravi Mital, Hony Chairperson of FOIR & IBBI, commended the WG for their efforts and recommended presenting the report to all the officials and staff of FOIR members in an online mode Additionally, he suggested that each regulator be requested to provide a note on issues of collaboration and cooperation with other sectoral regulators after which the Governing Body can meet again to discuss such issues.

14. The Governing Body of FOIR thereafter endorsed the report and decided that going forward, Members of the Organisations in FOIR can continue to meet at regular intervals to take forward the mutual collaborative endeavours in order to adapt and adopt the best practices in each organization thus adding value to the platform of FOIR.

AGENDA ITEM 4: MEMBERSHIP FOR NHAI

15. Shri Pawan Kumar, CGM-NHAI, joining on behalf of NHAI highlighted various areas where NHAI sought collaboration from FOIR member regulators. Given the value that FOIR as a platform had to offer, he confirmed NHAI's decision to join the Forum of Indian Regulators.

16. The GBM appreciated the decision and further requested the FOIR Secretariat to complete the formalities with respect to NHAI’s membership.

AGENDA ITEM 5: STATUS UPDATE BY FOIR TECHNICAL WORKING GROUP TO ASSESS AND FACILITATE ADOPTION OF 5G COMMUNICATION AND INFORMATION TECHNOLOGIES ACROSS VARIOUS INDUSTRY VERTICALS.

17. Shri A.K. Tiwari, Chairperson of the Technical Working Group (TWG) & Member PNGRB, briefed the GBM on the progress of the meetings of the WG and informed that three sectors- viz., Electricity, Oil & Gas, and Sea Ports- have been identified for studying use-cases and conducting technical and commercial analyses of fast communication technology. Moving forward, the WG plans to facilitate interactions between industry operators in these sectors and communication service providers to gather more insights.

18. The GBM acknowledged and noted the update.

19. At the conclusion of the meeting, Shri Harpreet Singh Pruthi, Executive Secretary of FOIR & Secretary, CERC, in his Vote of Thanks expressed his gratitude to all the members for their participation and commended the efforts of Shri Arun Goyal, Chairperson of the Inter-Regulator Working Group, as well as the members of the WG and the FOIR Secretariat team for producing a comprehensive report on inter-regulator cooperation. He also thanked NHAI for conveying their consent to join the Forum.

20. The meeting ended with Vote of thanks to the Chair.

****

ANNEXURE – 1

LIST OF PARTICIPANTS

S. No.	Name	Designation & Organisation
01.	Shri Ravi Mital	Chairperson, IBBI & Hony. Chairperson, FOIR
02.	Shri Jishnu Barua	Chairperson, CERC & Hony. Vice- Chairperson, FOIR
03.	Shri Anil Kumar Lahoti	Chairperson, TRAI & Hony. Vice- Chairperson, FOIR
04.	Shri S.K.G. Rahate	Chairperson, AERA & Hony. Vice- Chairperson, FOIR
05.	Shri M. Chandrasekhar	Chairperson, TNERC & Hony. Vice- Chairperson, FOIR
06.	Shri T. Sriranga Rao	Chairperson, TSERC & Hony. Vice- Chairperson, FOIR
07.	Shri Arun Goyal	Member, CERC & Hony. Secretary, FOIR
08.	Shri V. Ramesh Babu	Member, CERC & Hony. Treasurer, FOIR
09.	Shri M.D. Manohar Raju	Member, TSERC & Hony. Member, FOIR
10.	Shri Bandaru Krishnaiah	Member, TSERC & Hony. Member, FOIR
11.	Shri Sudhaker Shukla	Member, IBBI & Hony. Member, FOIR
12.	Shri Rafi Andrabi	Member, JERC for UTs of J&K and Ladakh & Hony. Member, FOIR
13.	Shri Paramjeet Singh	Member, PSERC & Hony. Member, FOIR
14.	Shri Harpreet Singh Pruthi	Secretary, CERC & Executive Secretary, FOIR
15.	Dr. Sushanta K. Chatterjee	Chief (Regulatory Affairs) CERC
SPECIAL INVITEES		
16	Shri A.K. Tiwari	Member , PNGRB
17	Shri D.K. Kamra	Member, AERA
18	Shri Inder Pal Singh Bindra	Secretary , CCI
19	Dr. (Prof.) Anoop Singh	IIT,Kanpur

20	Shri Anil Mehta	Director , FSSAI
21	Shri Pawan Kumar	Chief General Manager, NHAI
FOIR SECRETARIAT & OTHERS		
22	Ms. Rashmi Somasekharan Nair	Joint Chief (Regulatory Affairs) CERC
23	Dr. (Prof.) Naveen Sirohi	Director, IICA
24	Dr. Ajay Garg	Joint Director, FSSAI
25	Shri Hari Singh	Deputy General Manager, NHAI
26	Shri Puneet Arora	Deputy Chief (Finance), CERC
27	Shri Pankaj Rana	Executive Treasurer, FOIR
28	Shri Sushil Kumar Arora	Administrative Officer, FOIR
29	Shri Aman Raj	Research Associate, FOIR
30	Shri Davinder Kumar	Technical Officer (IT), FOIR
31	Shri Avanish R. Srivastava	Consultant, IICA

Annexure 1

Report of the Working Group on Inter-Regulator Co-operation

Presentation at

57th Governing Body Meeting of FOIR

July 23, 2024 | Tuesday

Contents of Report

- Introduction: Outlines the need for regulatory convergence
- Part A - Compilation of Best Practices
- Part B - Tariff Determination Principles
- Part C - Scope of Inter-Sectoral Collaboration
- A separate Volume of Inputs received at FOIR website

Working Group on Inter-Regulator Co-opeartion

- Proposal for formation of WG in the 53rd Governing Body Meeting (GBM) of FOIR
- Constitution of the Working Group on "Inter-Regulator Cooperation" on October 11, 2023
- Working group consisted of:
  - Shri Arun Goyal, Member – **CERC** (Chairperson)
  - Shri T S Balasubramanian, Member - **TAMP**
  - Shri D K Kamra, Member - **AERA**
  - Shri Anjani Kumar Tiwari, Member- **PNGRB**
  - Shri K Venkatesan, Member - **TNERC**
  - Shri Dr Sanjay Kumar Singh, Member - **UPERC**
  - Shri V Raghunandan, Secretary - **TRAI**
  - Dr Naveen Sirohi, **IICA**, Member Convenor
- NHAI as a Special Invitee
- Useful contributions from Dr S. K Chatterjee, Chief (RA), Mr. Rajeev Pushkarna, chief (Finance) of CERC; Ms. Ankita Tiwari, Research Fellow, IICA and many others

Functioning of the Working Group

- Terms of Reference:
  a. Compile best practices of different infrastructure regulators.
  b. Identify scopes for inter-sectoral learning.
  c. Suggest areas of cooperation amongst infrastructure regulators

- Responses received from various regulatory bodies including UPERC, TAMP, AERA, CERC, IBBI, PNGRB, TRAI, CCI, NHAI, TNERC, WBERC and MERC

- Four in-person deliberations to discuss the outline of the final report (including the present meeting) - January 31, 2024/April 30, 2024/May 21, 2024/July 16, 2024

Part A - Compilation of Best Practices

- Compilation of best practices shared by different regulators and a tabulation of common-themed best practices.
- Regulatory best practices shared by UPERC, TAMP, AERA, CERC, IBBI, PNGRB, TRAI, CCI, TNERC, WBERC, and MERC
- Identified the 5 common themed best practices
  a. Stakeholder Engagement (PMGRB, IBBI, TAMP, AERA & CERC)
  b. Consumer Grievance Redressal (PNGRB, UPERC, MERC, WBERC & TNERC)
  c. Regulatory Oversight (IBBI, AERA, UPERC & PNGRB)
  d. Energy Transition/ Green Energy (AERA, PNGRB & UPERC)
  e. E-Court System (CERC & MERC)

Some Notable Best Practices

- Periodic Organizational / Institutional Evaluation (IBBI)
- Light Touch Regulatory Approach (AERA)
- Unified Tariff for Natural Gas Pipelines – One Nation, One Grid and One Tariff (PNGRB)
- TRAI Apps - MySpeed and MyCall (TRAI)
- Pre-filing Consultations (PFC) for Mergers and Acquisitions (CCI)
- Power Market Regulations (CERC)
- Promoting Distributed RE – Net Metering, Group Metering and Virtual Net metering (MERC)
- Block Chain Based Peer-to-Peer (P2P) Energy Trading (UPERC)

Part B –Study of Tariff Determination Principles

- Tariff regulation ensures fair pricing and equitable access to essential services in **sectors with limited competition**

- **Balance the interests of consumers, service providers, and other stakeholders**

- Regulatory Bodies Covered for comparative Study of Tariff Determination Principles
  - Central Electricity Regulatory Commission (CERC)
  - Airports Economic Regulatory Authority of India (AERA)
  - Petroleum and Natural Gas Regulatory Board (PNGRB)
  - Tariff Authority for Major Ports (TAMP)

Variables Identified

Periodicity of Tariff Fixation
Approach Used
Broad Principles of Return
Capital Structure
Regulatory Asset Base (RAB)
Additional Capital Expenditure (Capex)

Return on Equity (RoE) /Capital Employed (RoCE)
Cost of debt
Depreciation
Interest on Working Capital (WC)
Operations & Maintenance (O&M) Expenditure

Capital Cost / Regulated Asset Base

S. No.	Parameter	**CERC**	**AERA**	**PNGRB**	**TAMP**
1.	Periodicity of Fixation	5 years	5 years	5 years (May be less based on the change in certain parameters as per Regulations)	3 years
2.	Approach Used	**Cost of Service (Hybrid: some of the Tariff components are normative)**	Cost of Service	Discounted Cash Flow	Cost of Service
3.	Broad Principles of Return	**ROE Approach**	ROCE Approach	ROCE Approach	ROCE Approach

Capital Cost / Regulated Asset Base (2)

S. No.	Parameter	CERC	AERA	PNGRB	TAMP
4.	Capital Structure (mix of debt and equity financing)	Normative Capital structure (Debt: Equity): **70:30**	Normative Capital structure (Debt: Equity): **48:52**	**Authorized Entity (AE) free to set capital structure**	Normative Capital structure (Debt: Equity): **50:50**
5.	Rate Base: Determination of the capital cost/Asset base	Cost of Land, Cost of Plant & machinery, ROW Cost and other infrastructure such as water, road and R&R plus IDC and IEDC	All the fixed asset i.e. aeronautical assets for aeronautical services at the airport.	Total Capital Employed (TCE): Gross Fixed Assets* - Accumulated Depreciation (on date of coming pipeline under PNGRB's purview;) + **Normative Working Capital**	Total Capital Employed (TCE) = Gross Fixed Assets (Build-Operate-Transfer) + Capital Work-in-Progress + **Working Capital**

Tariff Components

S. No.	Parameter	CERC	AERA	PNGRB	TAMP
1.	Return on Equity (RoE) /Capital Employed (RoCE)	Post Tax Return on Equity (RoE): i) **Transmission-15.00%** **ii) Thermal-15.50%** **iii) Hydro with storage- 17.00%** Equity component: maximum 30% of capital or actual whichever is lower	Return on Capital Employed: Fair Rate of Return (FRoR) on RAB = (g X Rd) + (1-g) X Re g: gearing ratio (debt/Total cost); Rd: pre-tax cost of debt; Re: post-tax cost of equity **Benchmark rate of 15.18% for equity**	Return on Capital Employed: **12% post-tax on Total Capital Employed**	Return on Capital Employed: **16% pre-tax on Total Capital Employed**

Tariff Components (2)

S. No.	Parameter	CERC	AERA	PNGRB	TAMP
2.	Cost of debt	Interest on loan allowed on normative debt based on **WAROI of actual/allocated loan portfolio**;	While computing FROR pre-tax Debt cost forecast submitted by Airport Operators are allowed after a **review with capping of 9%**	**Interest on loans not considered separately** (RoCE factors in cost of Debt)	Interest on loans not considered separately (RoCE factors in cost of Debt)

WARoI: Weighted average rate of interest

Tariff Components (3)

S. No.	Parameter		CERC	AERA	PNGRB	TAMP
3.	Depreciation	Life of Project	**Thermal: 25 years** **Hydro: 40 years** **Small Hydro Project: 25 to 30 years**	Useful life for aeronautical assets **specified through regulatory Orders**. For other assets as per the Companies Act, 1956	**30 years (Natural gas Pipeline)** or authorized extension	As per Companies Act
		Method used	Straight Line Method Depreciation rates specified in such a way to ensure repayment of a normative loan **corresponding to 70% of the fixed asset in 12 or 15 years** Salvage Value: 10%	Straight Line Method Residual asset value: 10%; Depreciation rates based on regulatory order or Companies Act, 1956	Discounted Cash flow used as such **Depreciation is not allowed separately** Residual asset Value: i) Pipelines: 5% (life 30 years) ii) Other Assets: As per Companies Act, 1956	Written Down Value (Concessionaire) / Straight Line Method (Major Ports)

Tariff Components (4)

S. No.	Parameter	CERC	AERA	PNGRB	TAMP
4.	Interest on Working Capital (WC)	• Cost of input stock (10-20 days); • Advance payment towards input stock (30 days); • Receivables equivalent to 45 days • Maintenance spares (% of O&M Expenses); • O&M expenses – (1month) **Interest Rate: *SBI MCLR + 325 basis point***	Quantum of **Working Capital as per actual** Interest rate: As per **actual subject to limit of 9%**	Normative WC equal to 30 days of operating costs (excluding depreciation) and 18 days of tariff receivables	• Inventory (capital spares for 1 year and other inventory for 6 months); • Sundry debtors; one month cash expenses)

Tariff Components (5)

S. No.	Parameter	CERC	AERA	PNGRB	TAMP
5	Operations & Maintenance (O&M) Expenditure	**Normative O&M** expenses specified for different projects (thermal, hydro, transmission)	• **Claimed O&M costs reviewed** and admitted considering actual costs in last audited accounts; • Also includes Statutory and compliance costs	**O&M costs part of cash outflows** and computed by AE on actual basis or assessed on normative basis by PNGRB (whichever is lower).	Exclusions include royalty/revenue share paid to the port, interest on loans, provision for bad/doubtful debts and slow moving inventory

Tariff Components (6)

S. No.	Parameter	CERC	AERA	PNGRB	TAMP
6	Operations & Maintenance (O&M) Expenditure- **Major Components**	• Manpower; • repairs and maintenance spares; • consumables; • Insurance and overheads; • Other spares up to Rs 10 lakhs; • **ACE of individual asset costing less than Rs 20 lakhs;**	• Employee Cost; • Administration & General Expenditure; • Repairs & Maintenance; Utilities & Outsourcing; Interest on WC loans <1 year; • Other outflows	• Consumables; • utilities; • salaries and wage; repairs and maintenance; • insurance premia on assets; • administrative overheads	O&M cost components (including depreciation) as per **audited annual accounts** admitted after review;
	O&M Expenditure- **Inflation Indexation**	**5.25% - 5.47%** annual escalation during the Control period	**Reserve Bank of India's Wholesale Price Index (WPI) forecast** used as reference	**4.5% annual escalation** on operating costs allowed for future. Trued up based on actuals	Ceiling ARR indexed by **100% of WPI**; Ceiling Scale of Rates indexed by up to 60% variation in WPI

Sharing of Non-Tariff Income

CERC

- Sharing of gains on account of **Non-Tariff Income**, i.e. from rent of land or buildings, eco-tourism, sale of scrap and advertisements in ratio of **1:1** between the generating company or the transmission licensee and the beneficiaries or the long term customers
- Sharing of **gains on account of Operational Parameter**, shared in the ratio of **50:50** between generating station and beneficiaries once in a financial year

AERA

- 30% of Revenue from Service other than aeronautical services is excluded while determining ARR

PNGRB

- Shared in case the return on capital employed **goes above 12% post tax return**

Part C - Scope of Inter-Sectoral Collaboration

- Possible areas of cooperation among various regulatory bodies
- UPERC, TAMP, AERA, CERC, PNGRB, TRAI, TNERC and NHAI shared their perspectives on the scope of collaboration
- Success of collaboration between TRAI and Electricity Regulators in launch of 5G
- NHAI and TRAI for OFC support infrastructure – Utilty Corridors for OFC ducts

AERA

- With CERC on formalization of performance standards related to the quality, continuity, and reliability of services at airports, as well as monitoring of these performance standards.
- With Electricity Regulators on Net Metering of Green Energy
- With PNGRB on ATF Pipeline Development

TAMP

- With Electricity Regulators for Green Shipping Initiative and for Berth Emission Reduction
- With PNGRB for Pipeline Expertise and LNG Bunkering
- With CCI on Competition Issues
- With AERA for Cruise & Ferry Terminals
- With AERA for Coastal Shipping and Inland Waterways
- With AERA for Digital Transformation

NHAI

- With PNGRB for Pipeline Infrastructure
- With TAMP for Port Connectivity Roads
- With TAMP, State Government and Railways for implementing Multimodal Logistics Park Projects (MLPP)

Electricity Regulators

- With TRAI on Utilization of Existing Electrical Assets, Smart Metering Infrastructure and Demand Response Programs
- With Inland Waterways Authority of India (IWAI) for Floating Solar Power Plants
- With NHAI for EV Charging Infrastructure and Solar Corridors
- With TRAI and CCI for Aerial Fiber and Small Cells Deployment
- With Real Estate Regulators for Green Energy Initiatives

Way Forward

- ✓ Make FOIR a vibrant Forum
- ✓ Learn from each others' best practices and adopt them
- ✓ Joint Training Programs and knowledge sharing platforms
- ✓ Bi-annual meetings (once every six months) for Members from all member bodies of FOIR for knowledge sharing on tariff matters.
- ✓ Need based Bilateral meetings between regulators on tariff matters.
- ✓ NHAI be requested to become member of FOIR
- ✓ Small focused Working Groups on few identified areas of Inter-Regulator Cooperation
- ✓ FOIR Annual Conference – Regulatory Challenges in dealing with private players

Thank You

Annexure 2

REPORT OF FOIR WORKING GROUP

INTER-REGULATOR COOPERATION

2024

DISCLAIMER

This report is based on responses from regulatory bodies regarding best practices, scopes of cooperation, and tariff determination principles, as well as insights from four in-person deliberations featuring presentations on these topics. Every effort has been made to ensure the accuracy of the data and information used. Forum of Indian Regulators (FOIR), Indian Institute of Corporate Affairs (IICA) or any other regulatory body mentioned in the report do not accept legal liability for the accuracy or any conclusions drawn from the material contained herein nor for any consequences arising from its use.

SUBMISSION OF REPORT

Date: July 20, 2024

To
The Chairperson,
Forum of Indian Regulators (FOIR)
8th Floor, Tower-B, World Trade Centre,
Nauroji Nagar, New Delhi - 110029.

Dear Sir,

On behalf of the Working Group on Inter-Regulator Cooperation, We are honoured to present this comprehensive report of the Working Group, which was formed following the discussions at the 53rd Governing Body Meeting (GBM) of the Forum of Indian Regulators (FOIR). This report encapsulates collective efforts and insights, all aimed at promoting a collaborative regulatory environment across various regulatory bodies.

In an era characterised by rapid technological advancements and evolving regulatory landscapes, cross-sectoral collaboration has become imperative. Our Working Group has focused on three areas within the regulatory landscape: compiling best practices of various regulators, identifying opportunities for inter-regulatory cooperation among regulators, and conducting a comparative study on Tariff Determination Principles.

Cross-sectoral collaboration is crucial for addressing complex issues, driving innovation, and streamlining regulations to foster sustainable growth. Our collaborative efforts aim to optimise resources, tackle challenges of digital transformation, and align with international standards to enhance competitiveness.

The Working Group held four in-person deliberations to compile a compendium of regulatory best practices, identify specific areas of cooperation among member bodies, and study tariff determination principles. This final report is based on inputs and responses received from various regulatory bodies on best practices, areas of cooperation, and tariff determination principles, presentations made during the meetings of the Working Group and web-based secondary research.

We hope that this report provides valuable perspectives on regulatory convergence, ensuring that our regulatory frameworks are robust, adaptive, and capable of fostering sustainable development of our nation.

Yours sincerely,

Arun Goyal
Chairperson

T S Balasubramanian
Member

D K Kamra
Member

Anjani Kumar Tiwari
Member

K Venkatesan
Member

Dr Sanjay Kumar Singh
Member

V Raghunandan
Member

Dr Naveen Sirohi
Member Convenor

Table of Contents

List of Members

Arun Goyal
Member, CERC
Chairperson, Working Group

D K Kamra
Member, AERA

Anjani Kumar Tiwari
Member, PNGRB

T S Balasubramanian
Member, TAMP

K Venkatesan
Member, TNERC

Dr Sanjay Kumar Singh
Member, UPERC

V Raghunandan
Secretary, TRAI

Dr Naveen Sirohi
Member Convenor, IICA

Special Invitees

1. **Shri Sunil Yadav**
   General Manager,
   National Highways Authority of India (NHAI)

2. **Shri Sharad Singh**
   Assistant Vice President,
   National Highways Logistics Management Limited (NHLML)

Abbreviations and Acronyms

ACE - Additional Capital Expenditure
AE - Authorized Entity
AERA - Airports Economic Regulatory Authority
AFC - Annual Fixed Cost
AFC - Annual Fixed Cost
AO - Airport Operator
APRA - Australian Prudential Regulation Authority
APTEL - Appellate Tribunal of Electricity
ARR - Annual Revenue Requirement
ASIC - Australian Securities and Investments Commission
ATF - Aviation Turbine Fuel
AUCC - Airport Users Consultative Committees
BME - Bridge Mounted Equipment
C&I - commercial and industrial
CAPEX - Capital Expenditure
CCI - Competition Commission of India
CERC - Central Electricity Regulatory Commission
CGRF - Consumer Grievance Redressal Forums
CNG - Compressed natural gas
COD - Commercial Date of Operation
CPI - Consumer Price Index
DSM - Deviation Settlement Mechanism
ERC - Electricity Regulatory Commissions
ESG - Environment, Social, and Governance
EU - European Union
EV - Electric Vehicles
FAQ - Frequently Asked Questions
FBSM - Final Balancing and Settlement Mechanism
FSLRC - Financial Sector Legislative Reforms Commission
GCV - Gross Calorific Value
IBBI - Insolvency and Bankruptcy Board of India
ICAO - International Civil Aviation Organization
IDC - Interest during Construction
IEDC - Incidental Expenditure during Construction
IOSCO - International Organization of Securities Commissions
ISMS - Information Security Management Systems
ISO - International Organization for Standardization
IWAI - Inland Waterways Authority of India

kWh - Kilowatt-hour
LNG - Liquefied natural gas
M&A - Mergers & Acquisitions
MCLR - Marginal Cost of Lending Rate
MERC - Maharashtra Electricity Regulatory Commission
MMBTU - Metric Million British Thermal Unit
MW - Megawatt
MYT - Multi-Year Tariff
NAPAF - Normative Annual Plant Availability Factor
NAPLF - Normative Annual Plant Load Factor
NATAF - Normative Annual Transmission System Availability Factor
NCAER - National Council of Applied Economic Research
O&M - Operations and Maintenance
OECD - Organization for Economic Cooperation and Development
P2P - Peer to Peer
PFC - Pre-filing Consultations mechanism
PIF - Project Investment Files
PMUY - Pradhan Mantri Ujjwala Yojana
PNG - Piped Natural Gas
PNGRB - Petroleum and Natural Gas Regulatory Board
PPP - Public-Private Partnership
QMS - Quality Management Systems
RAB - Regulatory Asset Base
RCD - Residual Current Devices
RE - Renewable Energy
RoCE - Return on Capital Employed
RPO - Renewable Purchase Obligation
SBI - State Bank of India
SLM - Straight Line Method
TAMP - Tariff Authority For Major Ports
TCE - Total Capital Employed
TGS - Thermal Generating Stations
TNERC - Tamil Nadu Electricity Regulatory Commission
TR - Tariff Regulation
TRAI - Telecom Regulatory Authority of India
UPERC - Uttar Pradesh Electricity Regulatory Commission
VAT - Value Added Tax
WBERC - West Bengal Electricity Regulatory Commission
WC - Working Capital
WPI - Wholesale Price Index

PREFACE

In the era of globalization, regulatory cooperation has become essential for governments to ensure transparency, efficiency, and consumer protection. Regulatory cooperation can vary from informal information exchanges and mutual understanding of good regulatory practices to more formal arrangements such as legislative harmonisation, mutual recognition agreements, and equivalency arrangements. These advanced forms of cooperation, where regulations are either uniform or aimed at similar policy goals and outcomes, offer greater potential benefits compared to informal exchanges.

When regulatory bodies across sectors come together, they benefit from a broader range of experiences, expertise, and resources. This collaboration allows them to expand their pool of evidence and best practices, making it easier to address policy choices by tilting decision making towards choices that have proven successful on ground. As a result, the overall costs associated with effective regulation are reduced. Additionally, coordinated efforts in implementing regulations ensure consistency and help prevent regulatory arbitrage.

To facilitate this cooperation, the Forum of Indian Regulators established the Inter-Regulatory Working Group. This group aims to enhance coordination and partnership among various sector-specific regulators. The core members of the working group included representatives from CERC, AERA, TAMP, PNGRB, TRAI, UPERC, and TNERC.

The Working Group has greatly benefitted from the valuable inputs, information, and suggestions provided by working group members and other regulatory bodies including CCI, IBBI, WBERC, MERC and NHAI. This collaborative effort has significantly contributed to the insights detailed in this report.

Arun Goyal
Chairperson
FOIR Working Group on Inter-Regulator Cooperation

Acknowledgement

This report represents an effort to identify areas of cooperation among regulatory bodies, compile best regulatory practices and study tariff determination principles of some infrastructure regulators in India. I extend my gratitude to Shri Arun Goyal, Member, Central Electricity Regulatory Commission, Chairperson of the Working Group for his leadership and invaluable guidance. I also thank members of the working group for their significant contributions, time, and suggestions. Special thanks go to the Chairpersons of NHAI and TRAI for their encouragement and for nominating senior officers of their organisations for participation in the Working Group deliberations.

The successful completion of the Working Group's deliberations and this report within approximately six months was made possible through the active participation and wholehearted support of all the members. I express my sincere appreciation to Shri Jishnu Barua, Chairperson; Shri Harpreet Singh Pruthi, Secretary; Dr S. K Chatterjee, Chief of Regulatory Affairs; Ms Rashmi Nair, Joint Chief of Regulatory Affairs; Mr Debasish Roy, Assistant Chief of Regulatory Affairs at CERC; and Mr Pankaj Rana, Executive Treasurer of FOIR as well as the staff of FOIR Secretariat for their encouragement and institutional support. I also wish to compliment Shri Rajeev Pushkarna, Chief, Finance Division; and Shri Puneet Arora, Deputy Chief, Finance Division at CERC for their unstinted support in the Tariff Determination part of Report.

Recognising the contributions of skilled professionals during this research assignment is essential, as this work would not have been possible without their support and inputs. I am grateful to all those who assisted in collecting primary data (feedback and responses) upon which this report is based. I also acknowledge the support and efforts of the IICA research team, comprising Ms Ankita Tiwari, Research Fellow and Ms Akanksha Chaudhri, Research Associate of IICA, for their work in collecting, collating, and analysing the data. Further thanks go to Mr Avanish Ranjan Srivastav, Consultant of IICA for coordination support.

Finally, I am indebted to Dr Ajay Bhushan Pandey, DG & CEO, IICA and Shri Praveen Kumar, Former DG & CEO, IICA for their support and encouragement during the course of this work.

Prof (Dr) Naveen Sirohi
Director, FOIR Centre, IICA
Member Convenor

Executive Summary

Aiming to enhance coordination and partnerships among diverse sector-specific regulators, the Forum of Indian Regulators (FOIR) constituted Working Group on "Inter-Regulator Cooperation" with the following Terms of Reference:

1. Compile best practices of different infrastructure regulators.
2. Identify scopes for inter-sectoral learning.
3. Suggest areas of cooperation amongst infrastructure regulators.

The final report is based on responses from regulatory bodies regarding best practices, scopes of cooperation, and tariff determination principles, insights from four in-person deliberations which included presentations on the aforementioned areas. At the outset, the report outlines the need for regulatory convergence. It is structured into three distinct sections covering the following areas:

Part A has compilation of best practices shared by different regulators along with tabulation of common themed best practices. It has the best practices shared by UPERC, TAMP, AERA, CERC, IBBI, PNGRB, TRAI, CCI, TNERC, WBERC, and MERC, showcasing their commitment to transparency, accountability, and efficiency. Five common themes of best practices (Stakeholder Engagement; Consumer Grievance Redressal Mechanism; Regulatory Oversight Initiatives; Energy Transition/ Green Energy and E-Court System) have been identified and the common themed best practices have been tabulated for easy reference and adoption by other regulators.

Part B provides a comprehensive picture of tariff determination principles among CERC, AERA, PNGRB, and TAMP, with the purpose of finding commonalities and differences regarding their tariff setting principles. This part comprises of detailed factual analysis of the financial parameters pertinent for tariff, giving an account of the treatment and consideration of parameters by each regulator. Some of the major parameters covered include capital base, return on capital, expenses during construction phase of the project, treatment of working capital and operations & maintenance expenditure. The sector-wise analysis is followed by a comparative table highlighting treatment given to different tariff determination variables by different regulators.

Part C explores the scope of Inter-Sectoral Collaboration (ISC) through enumeration of specific areas where the collaboration can take place. Effective ISC is crucial for addressing contemporary global challenges, enhancing regulatory capacity and fostering efficient governance. Some of the possible areas of

collaboration amongst different regulators suggested in the report include AERA and the Electricity Regulators on Net Metering for Green Energy; AERA & CERC on the formalization & monitoring of performance standards & on setting up Operation and Maintenance (O&M) Normative Cost Guidelines; AERA and PNGRB on Aviation Turbine Fuel Pipeline Development; TAMP with AERA for Cruise and Ferry Terminals, Digital Transformation, Amrit Kaal Vision 2047, Coastal Shipping and Inland Waterways; TAMP with PNGRB for LNG bunkering and pipeline expertise; TAMP with the Electricity Regulators for Berth Emission reduction and Green Shipping initiative; TAMP and CCI on Competition issues; the Electricity Regulators with TRAI on utilization of existing assets, smart metering infrastructure, demand response programs; the Electricity Regulators and IWAI for Floating Solar power plants; the Electricity Regulators and NHAI for EV Charging infrastructure and Solar corridors; TRAI with various authorities to identify and catalogue physical assets, streamline Right of Way (RoW), implementation of standardized fees and charges, developing effective dispute resolution mechanisms; NHAI with PNGRB for pipeline infrastructure; NHAI with TAMP for Port Connectivity Roads; NHAI with TAMP, the State Governments and Railways for implementing Multimodal Logistics Park projects. The section also highlights collaboration amongst all FOIR members for joint training programs and knowledge sharing platforms. It also recommends that FOIR Secretariat should request NHAI to become member of FOIR.

A **separate Volume of Inputs** is prepared consolidating all the inputs received from various regulatory bodies - both from the members of the Working Group i.e. CERC, AERA, PNGRB, TAMP, TRAI, UPERC and TNERC and others like CCI, NHAI, IBBI, WBERC and MERC. The same is available at FOIR website for reference.

Regulatory Convergence - An Introduction

1.1 The current regulatory framework in India can be traced back to the transformative actions of liberalization, privatization, and globalization that were initiated in 1991. These changes were influenced by earlier, more limited domestic reforms in the 1980s. Prior to 1991, the emphasis was on ensuring public interest through direct control, which mandated government approval for various commercial decisions. However, the landscape shifted after 1991. In most sectors of the economy, public interest is safeguarded through laws that oversee competition and through regulatory systems established for sectors with natural monopolies.

1.2 The rapid flow of goods, services, people and finance across borders is testing the effectiveness and the capacity of domestic regulatory frameworks. As a result, the global landscape in which policymakers and regulators operate has shifted dramatically. New opportunities and changes brought by globalisation and an increasingly interconnected world present contemporary policymakers and regulators with newer challenges.

1.3 The OECD 2012 guidelines mandates that "where appropriate, promote regulatory coherence through coordination mechanisms between the supranational, the national and sub-national levels of government, identify cross-cutting regulatory issues at all levels of government, to promote coherence between regulatory approaches and avoid duplication or conflict of regulations". In addition, Principle 10 (OECD 2012) provides for evolving areas of cooperation among the regulators for effective regulatory compliance.[1]

1.4 Collaborative efforts with other regulatory bodies are crucial in maintaining market integrity. When different regulatory bodies work together, they can share knowledge and expertise, streamline processes, and ensure that no gaps exist in the regulatory framework.[2]

1.5 The session on interactions between Competition Authorities and Sector Regulators in India organized by OECD highlighted the need to eliminate uncertainties in regulatory frameworks and procedures. This is pivotal for efficient resource utilization and to provide clarity for businesses, particularly for promoting ease of doing business. Collaborations between sectoral regulators and the Competition Commission of India (CCI) were seen as a strategy to optimize regulatory resources and maintain a balanced approach, preventing undue regulatory capture.[3]

1.6 The Financial Sector Legislative Reforms Commission (FSLRC) submitted a report in 2013 that advocated for regulatory convergence as a means to synchronize markets and leverage economies of scale and scope. A notable recommendation was the merger of various financial regulatory bodies such as the Securities and Exchange Board of India (SEBI), Forward Markets Commission (FMC), Insurance Regulatory and Development Authority of India (IRDAI), and Pension Fund Regulatory and Development Authority (PFRDA) into a Unified Financial Agency (UFA) to streamline oversight.[4] Further to cite an example, In Australia, the Australian Securities and Investments Commission (ASIC) collaborates with other regulatory bodies, such as the Australian Prudential Regulation Authority (APRA), to ensure that financial markets operate fairly and transparently. ASIC and APRA have signed a Memorandum of Understanding to facilitate information-sharing and coordination.

1.7 Targeted launch of 5G technology led to a new era of regulatory cooperation between the telecommunications and electricity sectors in India . A Working Group was established by Forum of Indian Regulators (FOIR) to present recommendations on "Cross Sector Collaborative Regulations between Telecom Regulatory Authority of India (TRAI) and Electricity Regulators." The group put forth its suggestions concerning cross-sector collaboration for aerial/underground fiber deployment, 5G small cells deployment, smart metering, smart grid monitoring, and issues related to the rapid establishment of infrastructure for expeditious 5G service rollout. The effective collaboration between the Central Electricity Regulatory Commission (CERC), State Electricity Regulatory Commissions (SERCs), and the TRAI facilitated the prompt and efficient rollout of 5G technology in India. Joint efforts with state authorities and distribution companies in providing essential infrastructure to telecom operators resulted in a significant milestone, with 150 million subscribers now enjoying 5G services in India, positioning the country at the forefront of global 5G implementation.[5]

1.8 The Niti Aayog's Thematic Report (2022) underlines the importance of Multi-Sectoral Collaboration (MSC) as a convergence approach, where diverse stakeholders and sectors collaboratively pursue common goals. The absence of effective coordination mechanisms can lead to decisions being made on the basis of inaccurate, biased or incomplete information. It may generate needless waste and duplication of effort among agencies.[6] Aditya Bhattacharjee and Oindrila De highlight deficiencies in regulatory design and alignment, underscoring the need for concerted efforts to align goals across different levels of government and address contradictions in statutes.[7]

1.9 India's regulatory landscape, which has evolved since the reforms initiated in 1991, is characterised by regulatory institutions that differ across sectors. Lalita Som and Faisal Naru emphasise the significance of a harmonised regulatory culture that reconciles conflicting objectives in response to evolving challenges.

Hindrances to regulatory governance, such as the dominance of state-owned enterprises, intricate multi-level government structures, and the independence of regulatory agencies, necessitate the identification of areas of cooperation to enhance regulatory practices.[8]

1.10 As recognized by the OECD 2012 guidelines, the effectiveness of regulations heavily relies on well-crafted rules and structures. However, the evolving nature of time necessitates continuous enhancement of regulatory designs. Governments are responding by seeking strategies to enhance clarity in regulatory frameworks. The scope of regulatory functions extends beyond their core mandates, encompassing responsibilities for industrial development and consumer protection. Despite their independent operational procedures, a deeper examination of their practices reveals shared areas of concern. Consequently, achieving effective obligation delivery requires a balanced approach to instil public confidence.

1.11 Therefore, considering the intricacies of regulatory alignment and the imperative for efficient collaboration in an ever-evolving regulatory landscape, the existing pieces of literature unravel the scope of cooperation among diverse regulatory bodies in India.

PART-A
Compilation of Regulatory Best Practices

Background & Scope

2.1 In response to the call for collaboration initiated by the FOIR Working Group on Inter-Regulator Cooperation, regulatory authorities from various sectors enthusiastically contributed their best practices. The aim was to compile a comprehensive resource highlighting exemplary regulatory approaches across diverse domains.

2.2 Contributions were received from various regulatory bodies including UPERC, TAMP, AERA, CERC, IBBI, PNGRB, TRAI, CCI, NHAI, TNERC, WBERC and MERC. These submissions represent a wealth of knowledge and expertise accumulated through years of regulatory practice and innovation.

2.3 The compilation is organised to facilitate easy reference and exploration of best practices across key areas of regulatory governance. From mechanisms for consultation and stakeholder engagement to methods for evaluating regulatory performance, each section offers insights from real-world experiences and successes.

2.4 By sharing these best practices, this section aims to foster a culture of learning and continuous improvement within the regulatory community. It serves as a testament to the collective commitment of regulators to uphold principles of transparency, accountability, and efficiency in the service of the public interest.

2.5 As regulators navigate the complexities of governance in an ever-evolving landscape, this compendium stands as a valuable resource for various regulatory bodies to learn from the best practices of each other. It is our hope that the insights contained herein will inspire further innovation and collaboration, ultimately contributing to the advancement of regulatory excellence across India.

Best Practices shared by Various Regulators

Airports Economic Regulatory Authority (AERA)

2.6 Airports Economic Regulatory Authority of India (AERA) was established under the AERA Act, 2008. It operates as an independent economic regulator for major Airport Operators (regulated entities) and Independent Service Providers (ISPs), providing regulated services at the major airports, relating to Cargo Facility, Ground Handling & Supply of Fuel to the aircraft. AERA's regulatory framework encompasses key regulatory principles advocated by International Civil Aviation Organization (ICAO) for economic oversight of airports & fixation of Airport User Charges viz., Transparency, Cost Relatedness, Non-Discrimination and Consultation with Users. Some of the robust regulatory practices followed by AERA are:

2.6.1 **Light Touch Regulatory Approach:** For non-material (if the value/quantity of services provided at the given airport relative to the aggregate of such services provided across all major airports is below the threshold level as specified in the Authority's guidelines), or competitive (2 or more ISPs are offering the same service at the given airport) services like cargo handling and fuel supply, AERA adopts a light touch regulatory approach. This approach allows for minimal regulatory scrutiny, with tariffs closer to market rates, promoting competition and negotiation between service providers and users. Under this approach the prices of regulated services are closer to market rates, resulting in minimal price distortion.

2.6.2 **Transparency & Stakeholders' Consultation:** For airport tariff, AERA adopts a cost plus/price caps mechanism. AERA ensures transparency by conducting stakeholder consultations throughout the tariff determination process. Consultation papers are made public, inviting feedback from stakeholders and airport users. Airport Operators are required to form Airport Users Consultative Committees (AUCC) to gather input on proposed capital expenditure (CAPEX) and tariff rates. During the consultation meetings with AUCC, pertinent details of 'Major Capital Projects' are discussed & necessary details of the project, including its need, benefits for airport users & its financial implication etc., are shared with the airport users.

2.6.3 **Benchmarking of Construction Costs:** To assess the reasonability of capital costs, AERA adopts normative rates for construction costs associated with key airport assets like terminal buildings, runways, PTTs & Aprons, etc. These benchmark costs are revised annually to reflect inflationary increases.

2.6.4 **True-up Mechanism:** A unique true-up mechanism ensures that tariff determinations are based on actual financial figures and traffic volumes achieved, rather than estimates. Any under or over-recovery from the previous period is adjusted in subsequent tariff cycles, ensuring fairness to both airport operators and users.

2.6.5 **Support for Green Initiatives:** AERA encourages investments in environmentally friendly initiatives at airports, such as renewable energy adoption, transition to electric vehicles, and water conservation measures. These initiatives are considered in tariff determinations, promoting sustainability and reducing carbon emissions in the aviation sector.

Central Electricity Regulatory Commission (CERC)

2.7 The Central Electricity Regulatory Commission (CERC) was established in 1998 under the provisions of the Electricity Regulatory Commissions (ERC) Act, 1998 with the objective to distance tariff regulation from the Government. The functions of the Commission were widened under the Electricity Act, 2003 which replaced the ERC Act, 1998. Apart from tariff fixation, CERC is vested with responsibilities of licensing, development of market, introduction of open access, specifying grid code, adjudication of disputes, setting performance standards, ensuring their compliance etc. Some of the robust regulatory practices followed by CERC are:

2.7.1 **Finalising the Tariff Regulations after Extensive Stakeholder Consultation:** The Central Regulatory Commission issues the Tariff Regulations every five years after detailed consultative process. To begin with Approach Paper is issued by to solicit comments of stakeholders on various options for regulatory framework to be considered while framing the Tariff Regulations for the new Control Period. The Approach Paper aims at soliciting preliminary views of the stakeholders on different aspects of tariff setting during the new Control Period. The comments are received from various stakeholders such as State Governments, State Electricity Regulatory Commissions (SERCs), Central Sector Utilities, State Sector Utilities, Private Sector Utilities, Consumer Representative Groups, Financial and Other Organizations, and Individual Experts. The meeting of the Central Advisory Committee is also held before preparation of the draft Tariff Regulations. The Draft Tariff Regulations are drafted after taking into consideration a) issues raised in the Approach Paper and comments thereon; b) issues otherwise raised by the stakeholders; c) the last five to ten years of performance of the central sector generating stations, other interstate generating stations and inter-state transmission systems; d) the existing economic environment of the power sector in the country; e) future needs of the power sector based on the anticipated generation mix and f) fostering energy security by promoting sustainable investments. Based on comments received on the draft Tariff Regulations, extensive consultations with all the stakeholders and the recommendations of the Central Electricity Authority, the Commission finalizes the Tariff Regulations for the control period. While finalizing the Multi- Year Tariff Regulations, the focus of the Commission is on regulatory certainty, simplification of the tariff determination process; preserving and augmenting existing capacities incentivising life extension and renovation & modernisation, providing the necessary push to investments through assured returns and mitigation of risk, and incentivising efficient plant operations and sustainable development.

2.7.2 **Open Access in the Transmission System:** In 2004, CERC established regulations for open access in inter-state transmission, allowing eligible entities to buy and sell electricity across India. This move enhanced efficiency, promoted competition, and encouraged investment in the sector, leading to a more dynamic marketplace.

2.7.3 **Power Market Regulations:** To address the challenge of visibility between sellers and buyers in the power market, CERC introduced guidelines for setting up power exchanges in 2007. This paved the way for the establishment of two power exchanges and the development of power market regulations in 2010. These regulations were aimed at fostering competition, ensuring robust surveillance, facilitating transactions and contracting in power markets.

2.7.4 **E-Court System:** Recognizing the need for a streamlined dispute resolution process, CERC launched the E-court initiative to adjudicate disputes efficiently. This initiative has significantly improved the speed and transparency of dispute resolution, aligning with principles of natural justice and enhancing overall effectiveness.

2.7.5 **Staffing Practice:** The CERC, in compliance with the Electricity Act 2003, manages its extensive qualitative and quantitative operations through a diverse staffing approach. This includes permanent recruitment, deputation from other organizations, absorption based on suitability, and engagement of corporate consultants. The CERC (Recruitment, Control, and Service Conditions of Staff) Regulations, 2007 (amended periodically), govern these appointments, ensuring stability of knowledge resources. Additionally, the Commission utilizes its Staff Consultants Regulations for contractual engagements, offering opportunities to both experienced professionals and freshers based on specific expertise needed. Regular updates to these regulations align with market standards, continuous capacity-building initiatives, including seminars and webinars, further enhance the skills and knowledge of its personnel.

2.7.6 **Other Initiatives:** In addition to these key regulations, CERC has introduced other important measures such as Grid Code, General Network Access Regulations, and Sharing of Transmission Charges and Losses. These initiatives underscore CERC's commitment to transparency, stakeholder interests, and investment-friendly policies.

Tariff Authority for Major Ports (TAMP)

2.8 TAMP was established in April 1997 under the Major Ports Trust Act of 1963, following the Port Law (Amendment) Act of 1997. The Authority strives to enhance the competitiveness of Indian ports by transitioning towards competitive pricing models. Its overarching goal is to elevate the performance of Indian ports to internationally competitive levels.

TAMP is committed to expeditiously disposing of tariff cases in accordance with applicable tariff guidelines, ensuring 100% compliance with prescribed timeframes. Some of the robust regulatory practices followed by TAMP are:

2.8.1 **Stakeholder Engagement:** TAMP has demonstrated its commitment to transparency and stakeholder engagement in its tariff-setting process. By adhering to government guidelines and conducting consultative hearings at the port level, TAMP ensures that all stakeholders have a voice in tariff decisions. Additionally, TAMP's orders are well-reasoned and transparent, providing clarity on tariff determinations.

2.8.2 **Simplification of Tariff Guidelines:** Over the years, TAMP has evolved its tariff guidelines to align with changes in the port sector, moving from a strict cost-plus regime to a norm-based tariff regime and eventually to a simplified Annual Revenue Requirement (ARR) model. Key initiatives, such as uniformity in port dues and berth hire rates, rationalisation of scale rates, and user-friendly provisions in the Scale of Rates, contribute to a more efficient and competitive port environment.

2.8.3 **Dispute Resolution:** With the enactment of the Major Port Authorities Act, 2021, major ports have gained more autonomy in tariff fixation, enabling them to adjust pricing strategies based on market dynamics. TAMP's role has shifted to that of an adjudicatory board, resolving disputes between ports, Public-Private Partnership (PPP) concessionaires, and users until the new Adjudicatory Board is constituted. TAMP's decisions in this capacity demonstrate a commitment to fairness and uniformity in tariff matters.

2.8.4 **Quality and Security Standards:** In terms of International Organisation for Standardisation (ISO) implementation, TAMP has adopted ISO 9001 and ISO 27001 standards for Quality Management Systems (QMS) and Information Security Management Systems (ISMS) respectively. This ensures streamlined processes, document standardisation, and continuous improvement in efficiency and security measures. Despite challenges such as the COVID-19 pandemic, TAMP's adherence to ISO standards has facilitated seamless operations and crisis management, including productive remote work arrangements.

Insolvency and Bankruptcy Board of India (IBBI)

2.9 The Insolvency and Bankruptcy Board of India (IBBI) was founded on October 1, 2016, under the Insolvency and Bankruptcy Code, 2016 (the Code). As a cornerstone of the ecosystem tasked with enforcing the Code, IBBI oversees the reorganisation and insolvency resolution of corporate entities, partnership firms, and individuals within specified time frames to maximise asset value. Its mandate includes fostering entrepreneurship, facilitating credit availability, and safeguarding the interests of all stakeholders. Some of the robust regulatory practices followed by IBBI are:

2.9.1 **Stakeholder Consultation:** The Insolvency and Bankruptcy Board of India (IBBI) has established a thorough consultative process for issuing regulations, ensuring transparency and stakeholder involvement. This process includes public consultation, dissemination of information, advice from advisory committees, and final approval by the Governing Board. Additionally, the IBBI engages stakeholders continuously through roundtable discussions, monthly meetings with regulated entities, and electronic platforms for feedback. This engagement helps inform regulatory decisions and fosters confidence in the insolvency framework.

2.9.2 **Periodic Organisational/Institutional Evaluation:** To evaluate its regulatory performance, the IBBI undergoes both external and internal assessments. An external evaluation conducted by the National Council of Applied Economic Research assesses governance, statutory functions, resource availability, and stakeholders' perception. Internally, the Governing Board evaluates its performance annually using a self-evaluation questionnaire covering board composition, meetings, and functions. These evaluation mechanisms ensure that the IBBI remains accountable, efficient, and responsive to the evolving needs of stakeholders and the regulatory landscape.

Telecom Regulatory Authority of India (TRAI)

2.10. The Telecom Regulatory Authority of India (TRAI) was, thus, established under the Telecom Regulatory Authority of India Act, 1997, to regulate telecom services, including fixation/revision of tariffs for telecom services across the country. Some of the robust regulatory practices followed by TRAI are:

2.10.1 **Transparent and Inclusive Consultation Process:** TRAI has been following a very transparent and open consultation process for arriving at a decision in the form of recommendations, regulation etc. There is a well established practice of our consultation process through issue of Consultation paper which is placed in public domain inviting comments and counter comments from stakeholders. All the comments and counter comments are also placed in public domain on TRAI website. After receipt of comments and counter comments, Open House Discussion (OHD) is conducted in which all stakeholders can participate. Since 2020, the OHDs are being conducted online which facilitates wider participation from across the world. Based on the deliberations and inputs of stakeholders, TRAI formulates its recommendations or regulations and the same are also displayed in Public domain.

2.10.2 **Monitoring and Implementation:** TRAI closely monitors the implementation and compliance of its regulations by the telecom service providers. For monitoring the performance of service providers, TRAI collects Performance Monitoring Report (PMR) from service providers on quarterly basis and publishes the Reports on TRAI Website. TRAI also does field audit to verify PMRs and assessment of quality of services in the field.

2.10.3 **Protection of Consumer Interest:** To protect the interest of telecom consumers, TRAI has laid down the framework for Redressal of grievances of telecom consumers by service providers through theTelecom Consumer Complaint Redressal Regulations, 2012. As per this framework, Telecom Service Providers are required to establish a two-tier complaint/grievance redressal mechanism for handling consumer complaints. In terms of this mechanism, aconsumer can lodge service-related complaints at the complaint centre of their Telecom Service Providers (TSPs). In case the complaint is not redressed satisfactorily by the service provider at the complaint centre, an appeal can be registered with AppellateAuthority of the TSPs.

2.10.4 **Regulatory Approach as Regards Tariffs:** As regards the scheme of regulation of telecom tariffs, TRAI has primarily followed a policy of "forbearance" in matters of determination of tariffs with active regulation being restricted to only a few telecom services. The TRAI believes that forbearance regime has led to introduction of new and innovative tariff products in the market designed to provide telecom services at affordable and competitive price to the consumers. Further, while on one side, TRAI, through its tariff regulation, has enlarged the scope of forbearance regime, on the other side, it has continuously endeavoured to provide adequate safeguards required to protect and promote consumer interests. The 'forbearance' is subject to requirement of reporting all tariffs launched by TSPs with the Authority ("Reporting Requirements") and adherence by TSPs to specified principles of tariff assessments, namely, (a) transparency; (b) non-discrimination; and (c) non predation, in the matters related to tariff.

2.10.5 **Ensuring Quality of Service:** TRAI collects periodical reports from all the service providers for monitoring the performance against set QoS parameters. Show Cause Notices (SCN) are issued to respective service provider for non-compliance of prescribed QoS benchmarks. The reply submitted by the service provider is considered by the Authority before taking a decision on imposition of Financial Disincentives (FD) for non-compliance of prescribed QoS benchmarks. TRAI also conducts periodical Drive Tests through engagement of Agencies as well through operator assisted drive tests (OADT) with the help of the operators onregular basis to monitor the Quality of Service provided by Service providers. The periodical reports are published on TRAI Website.

2.10.6 **TRAI Apps:** For assessment of Quality of Service, TRAI has taken some initiatives by developing mobile applications which facilitate interaction with consumers. Periodical upgradation of Apps is being done as per feedback and changing requirements due to technological advancements etc. **TRAI MySpeed App** collects millions of data points on daily basis which are spread geographically across the country and measured over different points of time in a day. These data points are used to assess wireless data Speed of the network. TRAI Analytical Portal

presents data speed of the networks in a particular area to the visitors in an interactive manner. It compares speed for different TSPs which empowers customers to take informed choice for choosing the network. **TRAI MyCall App** collects ratings of the voice call quality from several thousand customers on daily basis from different pockets of the networks.

Competition Commission of India (CCI)

2.11 The Competition Commission of India (CCI), established under the Competition Act of 2002, is mandated to eliminate practices that negatively impact competition, promote and sustain competitive markets, safeguard consumer interests, and ensure the freedom of trade across India. Additionally, the CCI is tasked with providing opinions on competition-related matters referred by statutory authorities established under any law. Furthermore, the CCI undertakes competition advocacy, raises public awareness, and provides training on competition issues to enhance understanding and compliance with competition laws. In its pursuit of enhancing competition law enforcement and fostering a more competitive business landscape, the Competition Commission of India (CCI) has instituted several noteworthy initiatives. Some of the robust regulatory practices followed by CCI are:

2.11.1 **Issuance of Frequently Asked Questions (FAQs):** Recognizing the importance of regulatory clarity, the CCI regularly publishes FAQs on various aspects of competition law. These FAQs serve multiple purposes: they provide clear explanations of complex legal provisions, helping stakeholders understand their responsibilities and the scope of the law; they enhance transparency in regulatory enforcement; and they promote consistency by being regularly updated to align with legal precedents, policy changes, and market dynamics. Developed in response to stakeholder queries and feedback, these FAQs offer relevant and practical guidance.

2.11.2 **Pre-filing Consultations (PFC) for Mergers & Acquisitions (M&As)**: To streamline the review of M&A transactions, the CCI has introduced the Pre-filing Consultations (PFC) mechanism, addressing the complexities involved in such deals. This mechanism promotes early engagement, encouraging parties to initiate dialogue and collaboration with the CCI before making formal filings. It provides guidance on submission requirements and procedural details, helping stakeholders better understand the regulatory process. By proactively addressing requirements and potential issues, the PFC mechanism enhances time efficiency and expedites the formal review process.

Petroleum and Natural Gas Regulatory Board (PNGRB)

2.12 The Petroleum and Natural Gas Regulatory Board (PNGRB) was constituted under The Petroleum and Natural Gas Regulatory Board Act, 2006 (NO. 19 OF 2006) notified via Gazette Notification dated 31st March, 2006. The Act provide for the establishment of Petroleum and Natural Gas Regulatory Board to protect the interests of consumers and entities engaged in specified activities relating to petroleum, petroleum products and natural gas and to promote competitive markets and for matters connected therewith or incidental thereto. Further as enshrined in the act, the board has also been mandated to regulate the refining, processing, storage, transportation, distribution, marketing and sale of petroleum, petroleum products and natural gas excluding production of crude oil and natural gas so as and to ensure uninterrupted and adequate supply of petroleum, petroleum products and natural gas in all parts of the country.

2.12.1 **Finalizing the Regulations after Extensive Stakeholder Consultation:** PNGRB issues the Public Consultation on draft Regulations based on the necessity for change/ requirement of Regulations. The Public Consultation aims at soliciting preliminary views of the stakeholders on different aspects of amendments. The comments are received from various stakeholders such as transporters, consumers, shippers, traders, terminal operators, etc. Subsequently, Draft Regulations are redrafted after taking into consideration many issues including issues raised in the Public Consultation and comments thereon and even issues otherwise raised by the stakeholders. The PNGRB based on comments received on the draft Regulations, extensive consultations with all the stakeholders finalizes the Regulations. Further, PNGRB also issues Public Consultation while determining tariff of each individual pipeline and follows the same approach as above.

2.12.2 **Unified Tariff:** PNGRB has amended PNGRB (Determination of Natural Gas Pipeline Tariff) Regulations to incorporate the regulations pertaining to Unified Tariff for natural gas pipelines with a mission of “One Nation, One Grid and One tariff”. The same has been made applicable effective from 1st April 2023. The reform will specially benefit the consumers located in the far-flung areas where earlier the additive tariff was applicable and facilitate development of gas markets and vision of government to increase the gas utilization in the country.

2.12.3 **Gas Exchange Regulations:** PNGRB notified Gas Exchange Regulations in 2020 and authorised 1st Gas Exchange in the country in December, 2020. Development of gas trading hub is a key step towards the direction of gas based economy, i.e. by creating a platform to facilitate development of gas market in a transparent and non-discriminatory environment. As evidenced in major gas markets, hub-based pricing mechanism can help to bring the required transparency in pricing of gas, attract gas supplies by addressing price distortions. From a strategic perspective for India to move to gas-based economy, hub provides most optimal solution for producers, importers, transporters, consumers and Government.

2.12.4 **Other Initiatives**:

- 100% coverage of country's area (except islands) for the development of City Gas Distribution (CGD) network, PNGRB along with City Gas Distribution entities launched a campaign from January 26th to March 31st, 2024 aimed to promote the adoption of PNG among households and to expand PNG consumer base across a broader segment of the population.
- PNGRB took an initiative for organizing a conference of International Oil and Natural Gas Regulators in GOA. The inaugural edition of the International Conference of Petroleum and Natural Gas Regulators was held under the aegis of the Petroleum and Natural Gas Regulatory Board (PNGRB) between 5-8th February 2024 during the India Energy Week 2024.
- PNGRB as a facilitator has been holding meetings with various state government officials for rationalizing the state taxes and other issues pertaining to the development of the gas infrastructure in the State.

Uttar Pradesh Electricity Regulatory Commission (UPERC)

2.13 UPERC, established under the Uttar Pradesh Electricity Reform Act 1999, serves as an autonomous corporate body tasked with regulating the power sector in Uttar Pradesh. Its primary objectives include ensuring fair and efficient electricity distribution, promoting competition, protecting consumer interests, and fostering the sustainable development of the state's power infrastructure. UPERC operates independently to enforce regulatory measures, set tariffs, resolve disputes, and oversee compliance within the electricity sector of Uttar Pradesh. Some of the robust regulatory practices followed by UPERC are:

2.13.1 **Promoting Sustainable Energy:** The comprehensive initiatives have been taken by UPERC to promote sustainable energy, particularly through innovative approaches like blockchain-based Peer-to-peer energy (P2P) energy trading and mini-grid regulations. These efforts encourage clean energy adoption and foster local economic development and job creation. The introduction of guidelines for P2P trading of solar energy on a blockchain-based platform is ground-breaking, potentially leading to a new era of local clean energy communities. The pilot study's success in facilitating energy trading demonstrates the feasibility and benefits of such a system. Additionally, the regulations for mini/micro grids contribute to decentralised renewable energy generation, ensuring access to electricity in remote areas while reducing transmission losses. The focus on rooftop solar promotion, net metering expansion, and green energy tariffs align with national goals and consumer preferences.

2.13.2 **Consumer-Centric Measures:** The UPERC has been focusing to enhance consumer protection, ensure efficiency, promote transparency, and encourage competition in the electricity sector. Measures like establishing consumer grievance

redressal forums and setting performance standards for utilities have been taken to ensure accountability and service quality. Electric vehicles (EVs) has been recognized as a separate tariff category and provisions have been made for EV charging at residences to accommodate evolving energy needs.

West Bengal Electricity Regulatory Commission (WBERC)

2.14 The WBERC is a statutory body established under the Electricity Regulatory Commission Act, 1998. Its primary responsibility is to determine electricity tariffs for generation, supply, transmission, and wheeling within the state of West Bengal. WBERC regulates both wholesale and retail electricity markets to ensure fair pricing, promote efficiency, and protect consumer interests. Additionally, WBERC addresses issues related to electricity distribution, transmission, and compliance with regulatory guidelines in West Bengal's electricity sector. Some of the robust regulatory practices followed by WBERC are:

2.14.1 **Regulation Development Process:** The regulation development process aims to enhance operational efficiency and address market externalities through a systematic approach. It begins with internal presentations to the Commission, highlighting sector-specific best practices and how proposed regulations address sector constraints. After approval, draft regulations and explanatory memoranda are published on the Commission's website and in widely circulated newspapers, inviting suggestions, objections, and comments from stakeholders and the public. All feedback is thoroughly analysed, and the Commission is briefed with a detailed Statement of Reasons (SOR) outlining observations and decisions based on the feedback. The finalized regulations, along with the SOR, are then presented to the Commission for approval. Upon approval, the regulations are notified through the Gazette and uploaded on the Commission's website, and subsequently submitted to the State Legislature for further acknowledgement and compliance.

2.14.2 **Grievance Redressal Mechanism:** To address consumer grievances effectively, a two-tiered grievance redressal mechanism has been established under Section 42 of the Electricity Act 2003. The first tier consists of Grievance Redressal Forums (GRFs) set up by each distribution licensee at various administrative levels, with at least one Central Grievance Redressal Officer at the corporate headquarters. The second tier involves Ombudsmen appointed by the Commission to adjudicate consumer grievances not satisfactorily resolved by the GRFs. Consumers initially approach the GRFs, and if dissatisfied with the resolution, they can escalate the grievance to the Ombudsman. Detailed procedures for the functioning of GRFs and Ombudsmen are outlined in regulations, with information about grievance redressal officers and Ombudsmen prominently displayed at bill payment centres and distribution licensee offices. The Ombudsman submits regular reports to the Commission, detailing the nature of grievances and their resolution status, on a monthly, quarterly, half-yearly, and annual basis.

Tamil Nadu Electricity Regulatory Commission (TNERC)

2.15 Consequent to the enactment of the Electricity Regulatory Commissions (ERC) Act 1998 the Government of Tamil Nadu constituted the Tamil Nadu Electricity Regulatory Commission (TNERC). It is vested with powers to determine the electricity tariff, regulate electricity purchase and procurement process, issuing licences, facilitate intra-state transmission and wheeling, specify State Grid Code, specify or enforce standards of performance and adjudicate upon disputes.

2.15.1 **Ensuring Consumer Safety:** To prevent indoor electrical accidents and ensure public safety, the TNE Regulations mandate the provision of Residual Current Devices (RCD) in every consumer installation.

2.15.2 **Effective Consumer Grievance Redressal:** To facilitate timely and efficient resolution of consumer grievances, various avenues have been established, including consumer complaints centres, online portals, and a WhatsApp complaints mechanism. Additionally, 44 Consumer Grievance Redressal Forums (CGRFs) have been established across all distribution circles in the state. These forums serve as the primary platform for addressing consumer complaints. In cases where consumers are dissatisfied with the CGRF's decision, an Ombudsman has been appointed as an appellate authority to settle grievances.

Maharashtra Electricity Regulatory Commission (MERC)

2.16 The MERC established on August 5, 1999, under the Electricity Regulatory Commission Act, 1998, and operational since August 12, 1999, was later recognized as the State Commission under the Electricity Act, 2003. MERC's key functions include determining tariffs for electricity generation, supply, transmission, and wheeling within the state, regulating electricity purchase and procurement for distribution licensees, facilitating intra-state transmission and wheeling, issuing licenses for transmission, distribution, and trading, promoting co-generation and renewable energy, adjudicating disputes between licensees and generating companies, levying fees, specifying and enforcing the State Grid Code, setting standards for service quality and reliability, fixing trading margins for intra-state trading, and performing additional functions as assigned under the Act. Some of the robust regulatory practices shared by MERC are:

2.16.1 **E-Hearing:** To address lockdown restrictions during the COVID-19 pandemic, MERC initiated its first e-hearing on May 14, 2020. Over 1000 e-hearings, including public hearings on tariff matters, have since been conducted. A test run for participants a day or two before the scheduled e-hearing ensures smooth operation, saving time and resources for all stakeholders.

These e-hearings are live-streamed on the MERC website, enabling remote attendance. Recognising the benefits, MERC's 2022 Transaction of Business Regulations made e-hearings the default option, with physical hearings available upon request.

2.16.2 **E-Filing:** The e-filing portal was launched on August 15, 2021 following stakeholder mock trials. With 721 registered users, the portal enables digital filing and access to documents. Initially, digital filings were parallel with physical copies, but positive feedback led to digital-only filings as mandated by the 2022 regulations. This transition enhances resource efficiency and transparency, facilitating broader consumer participation.

2.16.3 **Multi Year Tariff (MYT) Regime**: The Multi Year Tariff (MYT) Regulations 2019, effective from FY 2020-21 to FY 2024-25, introduce several significant provisions. These include a structured Return on Equity (RoE) framework, where a base RoE is complemented by additional RoE based on performance metrics. Cost recovery mechanisms now incorporate monthly fixed costs, varying between peak and off-peak hours and different demand seasons. Annual fuel utilization plans are mandated to enhance cost-effective generation practices. Adoption of operational expenditure (Opex) service models is encouraged to integrate technological advancements and improve operational efficiency. Furthermore, there is a mandatory allocation of 20% of expenditures towards repairs and maintenance, alongside the requirement for submitting cost audit reports to ensure prudent expense management.

2.16.4 **As Billed GCV for Energy Charge Computation:** MERC transitioned from 'as received' to 'as billed' Gross Calorific Value (GCV) for coal, allowing a relaxation band to compensate for statistical errors. This approach aligns costs more closely with billed coal GCV, improving accuracy in energy charge computations.

2.16.5 **Deviation and Settlement Mechanism:** Replacing the Final Balancing and Settlement Mechanism (FBSM), the Deviation Settlement Mechanism (DSM) was implemented on October 11, 2021. This aligns with national DSM protocols, maintaining grid discipline and security. The DSM involves 14 buyers and 47 sellers, with weekly billing.

2.16.6 **Renewable Energy (RE) Forecasting & Scheduling (F&S):** MERC's Renewable Energy F&S Regulations align with CERC guidelines to integrate wind and solar energy into the grid. Covering 139 pooling substations and 8,142 megawatt (MW) capacity, these regulations mandate real-time visibility and management of deviations within an allowed band. Future revisions may tighten deviation allowances.

2.16.7 **Green Tariff:** Introduced on March 22, 2021, the Green Power Tariff is Rs 0.66 [AG1] per kilowatt-hour (kWh) for consumers opting for 100% RE sources. This tariff, continued through FY 2024-25, is optional and charged above the regular tariff.

2.16.8 **Supply Code, SoP, and Power Quality Regulations:** The 2021 regulations enhance consumer services through digital transformation, simplified document requirements, defined service timelines, automatic compensation for delays, and automated reliability indices computation. Smart meter installation and digital communication are also emphasized.

2.16.9. **Consumer Grievance Redressal Forum (CGRF) Regulations:** The 2021 Consume Grievance Redressal Framework (CGRF) regulations have streamlined the process of addressing consumer complaints in the electricity sector. They introduce an Internal Complaint Redressal System via a web-based portal dedicated to managing grievances efficiently. E-Hearings have been implemented for cases handled by the Consumer Grievance Redressal Forum (CGRF) and the Electricity Ombudsman, facilitating quicker and more accessible dispute resolutions. Emphasis is placed on timely case resolution, prioritizing urgent matters with specified decision timelines to ensure swift outcomes. Additionally, biennial Consumer Satisfaction Surveys are conducted to gauge service quality and consumer feedback effectively.

2.16.10 **Promoting Distributed RE:** In promoting Distributed Renewable Energy (RE), the regulations support Rooftop RE Net-Metering for installations up to 5 MW, allowing consumers to offset their electricity bills with surplus energy generated. Group Metering enables the utilization of surplus energy across multiple premises, promoting efficient energy management. For consumers without suitable rooftop space, Virtual Net-Metering allows them to benefit from renewable energy installations at alternate locations, fostering broader adoption of sustainable energy practices.

2.16.11 **Green Hydrogen/Green Ammonia:** Green Hydrogen/Green Ammonia is being promoted by exemptions from cross-subsidy surcharge, additional surcharge, and transmission charges for green energy sourcing through Open Access.

2.16.12 **Green Energy Open Access:** The 2023 amendment to Open Access regulations facilitates green energy access for consumers with a contract demand of 100 kilowatt (kW) or more, allowing simultaneous rooftop RE and Open Access consumption. Different provisions for short-term and long-term access are defined, with nodal agencies designated for facilitation.

2.16.13 **Revision in Renewable Purchase Obligation (RPO) Trajectory:** The 2024 RPO Amendment Regulations specify a trajectory for different renewable energy sources, including wind, hydro, and distributed RE. Storage obligations are also introduced, and a penal mechanism for non-compliance ensures adherence to RPO targets.

2.16.14 **Capital Investments Approval:** The 2022 Capex Regulations mandate in-principle approval for schemes exceeding Rs 25 crore, ensuring prudent investment and protecting consumers from unnecessary costs.

Common Themed Best Practices Among Regulators

2.17 Analysis based on inputs received from various Regulators has revealed five common themes, which are perceived as best practices. These are:

(1) Stakeholder Engagement;
(2) Consumer Grievance Redressal Mechanism;
(3) Regulatory Oversight Initiatives;
(4) Energy Transition/ Green Energy and
(5) E-Court System.

The common themed best practices have been tabulated below for adoption by other regulators and easy reference:

2.17.1 Stakeholder Engagement

Regulator	Best Practices
TAMP	TAMP conducts detailed consultations with stakeholders, holding hearings at the port level to enhance participation. TAMP issues well-reasoned and articulate orders.
PNGRB	PNGRB issues the Public Consultation on draft Regulations based on the necessity for change/ requirement of Regulations. The Public Consultation aims at soliciting preliminary views of the stakeholders on different aspects of amendments. The comments are received from various stakeholders such as transporters, consumers, shippers, traders, terminal operators, etc. Subsequently, Draft Regulations are redrafted after taking into consideration many issues including issues raised in the Public Consultation and comments thereon and even issues otherwise raised by the stakeholders. The PNGRB based on comments received on the draft Regulations, extensive consultations with all the stakeholders finalizes the Regulations. Further, PNGRB also issues Public Consultation while determining tariff of each individual pipeline and follows the same approach as above.
AERA	AERA, as mandated by the AERA Act and International Civil Aviation Organization (ICAO) principles, sets tariffs for major airports transparently, with stakeholder consultation as a vital part of its approach. All proposals are thoroughly documented, with consultation papers made public to solicit feedback. Final tariff orders consider stakeholder views and service providers' counter comments for a balanced decision-making process.

CERC	The Central Regulatory Commission issues the Tariff Regulations every five years after detailed consultative process. To begin with Approach Paper is issued by to solicit comments of stakeholders on various options for regulatory framework to be considered while framing the Tariff Regulations for the new Control Period. The Approach Paper aims at soliciting preliminary views of the stakeholders on different aspects of tariff setting during the new Control Period. The comments are received from various stakeholders such as State Governments, State Electricity Regulatory Commissions (SERCs), Central Sector Utilities, State Sector Utilities, Private Sector Utilities, Consumer Representative Groups, Financial and Other Organizations, and Individual Experts. The meeting of the Central Advisory Committee is also held before preparation of the draft Tariff Regulations. The Draft Tariff Regulations are drafted after taking into consideration many issues including issues raised in the Approach Paper and comments thereon and issues otherwise raised by the stakeholders. The Commission based on comments received on the draft Tariff Regulations, extensive consultations with all the stakeholders and giving due consideration to the recommendations of the Central Electricity Authority, finalizes the Tariff Regulations for the control period.
IBBI	IBBI engages stakeholders through roundtable discussions in various cities, fostering diverse perspectives on regulations. Monthly meetings with regulated entities provide regular feedback opportunities. Electronic platforms enable continuous engagement, including commenting on proposed regulations, suggesting amendments to existing regulations, and providing general feedback via email. This multifaceted approach ensures accessibility and responsiveness to stakeholder input throughout the year.

2.17.2 Consumer Grievance Redressal Mechanism

Regulator	Best Practices
UPERC	The Commission has formulated CGRF regulations aligned with the Ministry of Power's Consumer Rights Rules, establishing a three-level grievance redressal forum. This initiative aims to empower consumers from urban, rural, and company levels, ensuring effective resolution of public grievances. With over 150 CGRFs to be established, compared to 20 in the previous system, the Commission is committed to hearing consumer voices and addressing concerns for fair and just outcomes.
PNGRB	PNGRB constituted various committees to review a) the extant consumer protection provisions and recommend a way forward to ensure comprehensive consumer protection framework, b) the extant Safety framework and c) on Vision-2040 Natural Gas Infrastructure.

WBERC	Under Section 42 of the Electricity Act 2003, the WBERC implements a two-tiered grievance redressal system. The first tier involves Grievance Redressal Forums (GRFs) established by distribution licensees at various levels, such as sub-district, district, region, or zone, with a Central Grievance Redressal Officer at the corporate headquarters. The second tier is the Ombudsman, appointed by the Commission to address consumer grievances that remain unresolved after being appealed to the GRF. The procedures for both entities are outlined in regulations, with contact information displayed at bill payment centres and distribution licensee offices. The Ombudsman provides regular reports to the Commission on the nature of grievances and their resolution status on a monthly, quarterly, half- yearly, and annual basis.
TNERC	For consumer grievance redressal, multiple channels such as complaint centres, online portals, and a WhatsApp complaints mechanism are available for timely resolution. Each of the 44 distribution circles has its Consumer Grievance Redressal Forum (CGRF), and an Ombudsman serves as the appellate authority to address grievances beyond CGRF decision.
MERC	The Internal Grievance Redressal Cell (IGRC) has been replaced with a modern web-based portal integrated with Consumer Call Centres, enabling automatic generation of complaint numbers and direct access to the Consumer Grievance Redressal Forum (CGRF). Additionally, video conferencing facilities for hearings at the CGRF and Electricity Ombudsman levels reduce the necessity for consumers to physically attend offices. Specific time limits have been set, requiring resolution of cases related to disconnections, new connections, reconnections, and non-supply within 15 working days of grievance registration, contrasting with a general 60-day timeframe for other cases. Distribution licensees are mandated to conduct biennial Consumer Satisfaction Surveys through independent agencies, evaluating various service aspects such as power quality, billing accuracy, and complaint handling effectiveness. These measures collectively aim to improve efficiency and consumer satisfaction in grievance handling processes.

2.17.3. Regulatory Oversight Initiatives

Regulator	Best Practices
UPERC	The Commission has established Standards of Performance Regulations in Uttar Pradesh, enabling electricity consumers to seek compensation for service delivery failures by distribution utilities. These regulations set performance standards to evaluate licensee performance and ensure distribution companies meet the minimum service standards required for consumer satisfaction.

PNGRB	CGD's are required to do year wise work program for number of domestic PNG connections, number of CNG stations and Inch kilometre of steel pipeline network as mentioned in the authorisation letter. PNGRB acts as facilitator and also reviews the status periodically. PNGRB is also doing periodical review of the status of the Natural Gas Pipeline and Petroleum Product Pipeline as well. In order to ease the process of regulatory oversight pngrb is in the process of improving the process of seeking information by strengthening digiltalisation processes and dissemination of information through our website. In order to develop Oil & Gas Infrastructure, PNGRB either on receipt of the request from the entities or may suo-motu initiate proposal inviting entities to participate in the process of selection of an entity for laying, building, operating or expanding pipeline along any route
AERA	It mandates service providers to share Project Investment Files (PIFs) with airport users for major capital projects proposed during the regulatory control period. Airport operators consult the Airport Users Consultative Committee (AUCC) at various project stages and document user views, suggestions, and objections, along with operator responses, for submission to AERA.
IBBI	The Insolvency and Bankruptcy Board of India (IBBI) conducted comprehensive evaluations of its regulatory performance through both external and internal assessments. In 2021, the IBBI commissioned the National Council of Applied Economic Research (NCAER) to conduct an external evaluation, focusing on its regulatory effectiveness independent of the Insolvency and Bankruptcy Code, 2016. The evaluation framework included governance, fulfilment of statutory powers and functions, resource availability, and stakeholders' perception, utilizing 97 performance indicators to gauge statutory compliance and regulatory practices. The findings highlighted 'Excellent' ratings for 17 out of 25 indicators in governance and 58 out of 72 indicators in the fulfilment of statutory responsibilities, with the full report publicly accessible on the IBBI's website. Internally, the IBBI's Governing Board has implemented an annual Self-Evaluation Questionnaire since the fiscal year 2018-19. This questionnaire assesses aspects such as Board composition, meeting procedures, and operational functions, with results published annually in the Board's report.

2.17.4. Energy Transition/Green Energy

Regulator	Best Practices
UPERC	Certain consumers, particularly in the commercial and industrial (C&I) segment, are increasingly interested in Environment, Social, and Governance (ESG) responsibilities and are willing to pay a premium for "Green Energy'. This aligns with market access preferences in countries prioritizing green energy. The Government of India mandates commissions to provide Green Energy tariffs. UPERC became the second state to approve such tariffs, allowing consumers to opt for them by request.
AERA	The AERA promotes investments in environmentally sustainable technologies across major airports to mitigate carbon emissions and achieve net carbon neutrality goals. Key initiatives include installing solar power plants and adopting energy-efficient measures such as LED lighting, with surplus energy being supplied to local grids. Transitioning ground support equipment and vehicles from fossil fuels to electric power helps reduce both air and noise pollution significantly. The implementation of Bridge Mounted Equipment (BME) ensures pollution-free delivery of power and conditioned air to parked aircraft, further enhancing environmental stewardship. AERA also integrates green technology considerations into tariff determinations and emphasizes water conservation efforts. This includes establishing effluent treatment plants, sewage treatment facilities, and rainwater harvesting systems to recycle treated water and preserve water resources effectively.
PNGRB	PNGRB organised a mega-stakeholder interaction on Hydrogen transmission in Natural Gas Pipelines and City Gas Distribution Networks. Petroleum and Natural Gas Regulatory Board (PNGRB) is progressing on the task of transporting Green Hydrogen through Natural Gas transmission lines by blending hydrogen with Natural Gas. This mega-stakeholder interaction will also pave way forward to achieve the target of 5 MMTPA Green Hydrogen production by 2030, set by Government of India under its clean energy agenda through National Green Hydrogen Mission.

2.17.5. E-Court System

Regulator	Best Practices
CERC	Serving as a quasi-judicial authority under the Electricity Act, CERC adjudicates disputes through petitions, aiming for swift resolution, transparency, efficiency, and adherence to natural justice principles. The E-Court initiative, known as System for Adjudication Using Digital Access & Management of Information through Network Integration (SAUDAMINI), revolutionized CERC's legal operations. It introduced an integrated, flexible, and dynamic online database for filing petitions and documents, facilitating online communication of proceedings and orders. This initiative significantly modernized CERC's legal processes, aligning with contemporary standards of efficiency and transparency.
MERC	In response to Covid-19 lockdowns, the Commission introduced E-Hearings on May 14, 2020. It has conducted over 1000 sessions, including public hearings on tariff matters, via this platform. Trial runs before sessions ensure efficient operations, saving time and resources. Live streaming on the MERC website promotes transparency, accessible from any device. Recognizing their benefits, updated Transaction of Business Regulations 2022 now E- Hearings are the default option, with option for physical hearings upon request. Similarly, the E-Filing portal, launched on August 15, 2021, after successful mock trials, has attracted 721 users. This digital platform allows seamless submission and access to petitions and documents, eliminating the need for physical copies. Mandated exclusively by Transaction of Business Regulations 2022, digital filing enhances efficiency, transparency, and consumer participation, reflecting modern regulatory standards.

PART-B
TARIFF DETERMINATION PRINCIPLES

3.1 Tariff regulation is a crucial component of economic policy that ensures fair pricing and equitable access to essential services in industries where competition is limited or monopolistic conditions prevail. Regulatory authorities play a vital role in balancing the interests of consumers, service providers, and other stakeholders by setting, monitoring, and enforcing tariffs. In India, various sectors such as electricity, aviation, natural gas, and major ports have dedicated regulatory bodies tasked with overseeing tariff aims to promote efficiency, transparency, and sustainability.

3.2 The Central Electricity Regulatory Commission (CERC) is the apex regulatory body for the electricity sector in India. It was established under the Electricity Regulatory Commissions Act, 1998, with the mandate to regulate the tariff of generating companies owned or controlled by the central government, interstate transmission of electricity, and to adjudicate disputes involving generating companies or transmission licensees. CERC aims to foster competition, efficiency, and economy in the electricity market while protecting consumer interests and ensuring the financial viability of the electricity sector.

3.3 In the aviation sector, the Airports Economic Regulatory Authority of India (AERA) is responsible for determining tariffs for aeronautical services at major airports. Established under the Airports Economic Regulatory Authority of India Act, 2008, AERA's primary objective is to create a level playing field and foster healthy competition among airport operators. It regulates tariffs, monitors performance standards, and ensures transparency and consumer protection in the provision of aeronautical services.

3.4 The Petroleum and Natural Gas Regulatory Board (PNGRB) oversees the Natural Gas Sector, including the transportation, distribution, and marketing of natural gas and petroleum products. Formed under the Petroleum and Natural Gas Regulatory Board Act, 2006, PNGRB's role is to ensure the availability of hydrocarbons in an equitable manner, protect consumer interests, and promote competitive markets. It sets tariffs for pipelines and city gas distribution networks, ensuring that these are reasonable and promote the efficient utilization of infrastructure.

3.5 The Tariff Authority for Major Ports (TAMP) regulated tariffs for services provided at major ports in India. Established under the Major Port Trusts Act, 1963, TAMPs' primary function was to fix and revise tariffs for port services and facilities to ensure that they are fair and reasonable.

By doing so, TAMP aimed to enhance the efficiency and competitiveness of Indian ports, fostering trade and economic growth. The Tariff of Major Ports has been de-regulated from the year 2021.

3.6 These regulatory bodies, through their tariff-setting practices, play a significant role in shaping the economic landscape of their respective sectors. They ensure that tariffs reflect the cost of service provision, encourage investment in infrastructure, and protect the interests of consumers. Understanding the specific tariff practices followed by CERC, AERA, PNGRB, and TAMP provides insights into how these regulators achieve their objectives and the challenges they face in balancing interests of consumers and developers. The practices followed by each regulatory body will be discussed in detail in the subsequent paragraphs, providing a comprehensive overview of their methodologies, regulatory frameworks, and the impact on their respective industries.

Central Electricity Regulatory Commission (CERC)

3.7 The Electricity Act, 2003 (EA)[9] empowers the Commission (CERC) to regulate and determine tariffs. These include:

- Generating companies owned or controlled by the central government
- Generating companies selling electricity in multiple states
- Inter-state transmission of electricity, including setting tariffs for such transmission

3.8 Sections 61, 62 and 63 of the Electricity Act (EA) deal with the tariff determination function entrusted to central and state electricity regulators. Section 61 empowers the Commission to specify, by regulations, the terms and conditions for tariff determination in accordance with the Act. It also notifies 9 guiding principles which form the cornerstone of Power tariff regulation in India. Some of these include:

1. Commercial principles as the foundation for generation, transmission, distribution and supply of electricity;
2. Consideration of factors encouraging competition, operational efficiency, economical resource use, good performance and optimum investments;
3. Balancing of consumers' interest and cost recovery of electricity;
4. Promotion of power generation from renewable sources;
5. National Electricity Policy and tariff policy.

3.9 Built upon the structural foundation provided by the EA 2003, CERC's tariff framework is designed on the principles that:

(I) provide regulatory certainty to the utilities, investors and consumers through transparency, consistency and predictability of regulatory approach, thereby minimizing the perception of regulatory risk;
(ii) address risk sharing mechanism between utilities and consumers (based on controllable and uncontrollable factors);

(iii) ensure financial viability of the sector to attract investment; and
(iv) reflect recent developments, actual performance in the previous tariff control period while determining operational norms for current control period under consideration.

3.10 The Central Electricity Regulatory Commission (CERC) establishes a Multi-Year Tariff (MYT) framework to provide long-term stability and predictability in electricity prices. The MYT framework is typically reviewed and updated for every five year control period. The latest MYT is notified vide the CERC (Terms and Conditions of Tariff) Regulations, 2024, which applies to the control period 2024-2029.[10]

Procedure for Tariff Approval

3.11 The regulated entity (generating company or transmission licensee) is required to file a tariff petition for a newly commissioned generating station or transmission system, i.e. a project achieving date of commercial operation (COD) in the 5-year control period under consideration. The petition, containing details of capital costs (land, plant and machinery, support infrastructure like roads & water, interest during construction, etc.) and operational costs (fuel, manpower, maintenance, supplies, etc.), is required to be submitted within 90 days from the actual COD. For the already existing projects, details of actual costs in the preceding control period are submitted for truing up along with the projections for additional expenditure in the control period under consideration for tariff determination.

3.12 After receiving the petition, CERC undertakes a thorough prudence checks of submitted capital cost and other elements as per the applicable provision of tariff regulations. Simultaneously, the petition is published by the regulated entity (RE) for wide public access. Over the course of multiple hearings, the Commission takes into consideration the submissions received from concerned stakeholders (the regulated entity, stakeholders, and entities permitted by CERC including consumers or consumer associations) to carry out true up of tariff on the basis of actual capital expenditure and specified normative operational parameters for the previous control period. Tariff for new control period is also determined after multiple hearings on the basis of admitted capital cost during last control period and projected capital-expenditure allowable on various counts as per the tariff regulations. The regulated entity has the option to file for a review of the final tariff order before CERC or appeal against the order before the Appellate Tribunal of Electricity (APTEL).

Tariff Fixation Methodology (Cost Plus Approach)

3.13 The petitions are broadly classified based on the nature of business into Generation and Transmission cases. For thermal and hydro generating stations, tariff is bifurcated into 2 components:

(i) Capacity Charge for recovery of annual fixed cost (AFC) which comprises following variables:

- Return on Equity;
- Interest on Loan Capital;
- Depreciation;
- Interest on Working Capital;
- Operation and Maintenance Expenses.

(ii) Energy Charge for recovery of landed fuel cost which comprises following variables:

- cost of primary fuel;
- cost of secondary fuel oil consumption;
- and cost of limestone or any other reagent, as applicable.

For Hydro generating stations, the energy charge is based on the 50% of the AFC.

For transmission projects, the tariff is made up of transmission charges which are reflective of the project (including any communications systems associated with the given transmission project) AFC.

3.14 Recovery of capacity charge, energy charge, transmission charge and incentive shall be based on the achievement of the Annual Plant Availability Factor (NAPAF) or NATAF in case of generation or transmission respectively.However, in case of lower availability, generation or transmission licensee are allowed to recover AFC on prorata basis. For example, Thermal Generating Stations (TGS) are required to achieve a minimum normative Annual Plant Availability Factor (NAPAF) of 85%. The norms are also notified for other factors like heat rate, specific fuel consumption,auxiliary power consumption and reagent use. Similarly, AC systems based Transmission companies must meet a Normative Annual Transmission system Availability Factor (NATAF) of 98% to recover their annual fixed cost.

3.15 Regulated Entities can earn an additional “incentive” on top of the recovery of their approved AFC if their performance exceeds the notified operational norms (NAPAF/NATAF). CERC establishes specific performance thresholds for this incentive. For instance, while the thermal generating stations can earn this incentive on achieving a PLF (annual plant load factor) exceeding the minimum required 85%, transmission companies with a NATAF of 98.5% or higher can recover the incentive over and above annual transmission charges.

Financial Variables

3.16 Tariff is determined on the basis of actual/projected financials submitted by the regulated entity in its tariff petition as per the Commission specified formats viz. Tariff Forms. The determination of capital cost is a critical step in tariff. Capital cost forms the rate base for determination of return on investment. Below is a brief account of some of the major variables comprising Annual Fixed Costs (AFC) that are reflected in the approved tariffs.

3.17 **Capital Cost:** CERC admits incurred/proposed expenditures including construction expenses, expenditure on acquiring plant and machinery, interest during construction, additional capitalization, emission control systems, environment clearance-related expenses, renovation and modernization expenses, ash disposal, biomass handling equipment, etc. There are several issues and challenges with respect to the capital cost, for example:

(i) Variation between actual project cost vis-a-vis projected capital cost.
(ii) Delay in project execution is due to various reasons such as delay in land acquisition, delay in getting statutory approvals/clearances, delay due to geographical location of the site, delay on the part of contractor /supplier of material, execution philosophy etc, leading to increase in IDC, overhead expenses etc.
(iii) Estimated capital cost as per investment approval may not truly reflect the efficiency in procurement and execution of the project when compared to market rates.

3.18 The construction efficiency is a key element for preventing slippage in commissioning of a project. The delay in commissioning has a direct impact on the capital cost of the project. In case of delay in commissioning of the project, capital cost would increase on account of interest during construction (IDC), escalation in prices and increase in establishment charges and the same can be capitalized with allowance of time overrun. Bringing efficiency during the construction phase is an area of concern. The case of delay in achievement of commercial date of operation (COD) has also been accounted for in CERC regulations in the form of being attributable to either controllable or uncontrollable factors. The petitioner (generation or transmission project) is required to justify the delay and furnish details of IDC and incidental expenditure during construction (IEDC) costs for the duration of the delay. Such costs may be disallowed or allowed after a prudence check, depending on whether the delay is attributable (fully or partially) or not to the petitioner.

3.19 **Capital Structure:** The financing structure allowed is 70 (debt): 30 (equity). Any equity financing above 30% is considered as normative loan and considered for inclusion in tariff accordingly. On the other hand, if equity deployed is less than 30% of the capital cost, actual equity is considered.

3.20 **Interest During Construction (IDC) and Incidental Expenditure During Construction (IEDC):** IDC is computed on the actual/normative loan base, considering the weighted average rate of interest (WARoI) of the loan portfolio. For a normative loan base (equity in excess of 30% of capital cost), if IDC is to be allowed before infusion of actual loan, 1-year SBI MCLR as on April 1 of the respective year is considered as a rate of interest. Post-infusion of actual loan amount, the WARoI for the quarter is considered. IEDC forms a part of capital cost and is computed from the zero date, taking into account pre-operative expenses up to the actual COD. Revenues earned during the construction period up to actual COD (e.g. interest on deposits or advances) are deducted from IEDC.

3.21 **Additional Capital Expenditure (ACE):** ACE is addition to the project capital cost (subject to the financing structure norms), thereby earning the RoE specified for the given project type. The 2024 Tariff Regulations provides for clear and segregated provisions for ACE up to cut-off date, after cut-off date and beyond original scope. Some of the elements of ACE as admitted by CERC may include payment towards admitted liabilities, deferred works, procurement of initial capital spares, arbitration awards, compliance with laws, infrastructure development for hydro projects, and force majeure events. ACE on Account of Renovation and Modernization (R&M) for life extension, or compliance with revised emission standards is also admissible with prudence checks.

For the first time in the 2024 Tariff Regulations, the Commission has included the ACE up-to Rs. 20 lakhs (individual items) in the normative Operation and Maintenance Expenses to reduce regulatory overburden and this would also enable more focused Prudence check and faster disposal of petitions. A detailed prudence check of the total capital cost (capital cost and ACE) claimed by regulated entities is carried out, based on the financing plans, technology use, competitive bidding and issues relating to time over-run by the generating company or transmission licensee.

3.22 **Return on Equity (RoE):** CERC allows regulated entities (REs) a pre-specified rate of return only on the equity-component of capital cost. This is one of the elements of AFC which are transmitted to the tariff through capacity charges. There is no change in RoE for existing projects in the 2024 Tariff Regulations. Whereas for new projects, the 2024 Tariff Regulations provides post-tax RoE rates of 15.00%, 15.50%, and 17.00% for transmission systems; thermal and run-of-river hydro stations; and storage-type, pumped storage, hydro stations respectively. These rates are reviewed for each MYT regulation.

3.23 **Return on Additional Capital Expenditure:** Since the CERC-approved Additional Capital Expenditure (ACE) is added to the project's capital cost, it earns the same rate of return as the Return on Equity (RoE) specified for that type of project. However, for ACE beyond the original scope—such as costs for emission control systems, changes in law, and force majeure events—the allowed RoE is equivalent to the 1-year marginal cost of lending rate (MCLR) of the State Bank of India (SBI) plus 350 basis points, capped at 14%.

3.24 **Cost of Debt or Interest on Loan:** The debt component of project finance contributes to the annual debt service cost, which is part of the Annual Fixed Cost (AFC). The normative outstanding loan as of April 1, 2024 (or the start of the relevant control period) is determined by subtracting the cumulative repayments up to March 31, 2024, from the gross normative loan. CERC calculates the interest rate based on the Weighted Average Rate of Interest (WARoI) of the project's actual or allocated loan portfolio and applies it to the normative average loan for the year.

The annual loan repayment for each year of the Multi-Year Tariff (MYT) period, starting from the first year of commercial operation, is considered equal to the allowed depreciation for that year. If there is no actual loan outstanding but a normative loan exists, the last available WARoI is used. For projects without any actual loans, the WARoI of the Regulated Entity's (RE's) overall loan portfolio is considered.

3.25 **Depreciation:** Asset depreciation follows the Straight Line Method (SLM) from the project's Commercial Operation Date (COD) and is based on the admitted capital cost. The depreciation rates are structured to ensure adequate cash flow for meeting loan repayment obligations over either a 15-year period (for new projects) or 12 years (for existing projects).

This means that each year's depreciation expense is calculated to accumulate over the specified period, fully repaying the loan amount. The salvage value used for depreciation calculations is set at 10% of the asset's value at the end of its economic life, except for IT equipment and software, which are fully depreciated upon acquisition, and land (excluding leased and reservoir land for hydro stations), which is not depreciable. Cumulative depreciation for decapitalized assets is adjusted accordingly.

3.26 **Working Capital (WC) requirement:** Working capital components are allowed on a normative basis, including expenses for input and supply reserves, and inventory. CERC regulations specify the required quantum of working capital expenses for different project types to compute interest on working capital.

For coal/lignite thermal stations, this includes 10 days and 20 days' costs of coal/lignite for pit-head and non-pit-head stations respectively, 15 days' limestone stock, 30 days advance payment for both coal/lignite and limestone, secondary fuel oil costs for 2 months, maintenance spares at 20% of operation and maintenance (O&M) expenses, receivables for 45 days of capacity and energy charges, and 1 month of O&M expenses as allowable working capital expenses. Similarly, for hydro stations and transmission systems, allowable working capital expenses include receivables for 45 days of availability for capacity (AFC), maintenance spares at 15% of O&M expenses, and 1 month of O&M expenses.

3.27 **Interest on WC:** This is determined on a normative basis. The regulations specify a reference rate of interest. For new projects achieving Commercial Operation Date (COD) on or after April 1, 2024, this rate is defined as the SBI MCLR plus 325 basis points as of April 1 of the year in which the project achieves COD. For truing-up purposes, the interest rate is set at the SBI MCLR plus 325 basis points as of April 1 of each financial year during the tariff period.

3.28 **Operations & Maintenance (O&M) Expenditure:** These are recurring expenditure/ongoing expenses necessary for the operation and maintenance of the project, and are approved on a normative basis. They encompass expenditures on manpower, maintenance, repairs, maintenance spares, other capital spares (up to Rs 10 lakhs), individual asset replacement (less than Rs 20 lakhs), consumables, insurance, overheads, and fuel not utilized for electricity generation. CERC regulations stipulate O&M expenses based on the type of project (thermal or hydro generating stations, transmission systems). Additionally, adjustments for costs resulting from changes in laws (if yearly impact exceeds 5% of normative O&M expenses) or wage revisions (for projects owned by Central/State governments) are permitted during tariff truing-up. In the north-eastern and hilly regions, a multiplication factor of 1.50 is applied to the prescribed normative O&M expenses for transmission projects to account for the challenging geographical conditions.

3.29 **Inflation Indexation:** The O&M costs are annually indexed to a weighted average of Wholesale Price Index (WPI) and Consumer Price Index (CPI). For this, regulations specify the indexation rate, which varies depending on the project. Cost of thermal stations and transmission systems are escalated at a rate of 5.25% (weightage WPI:CPI 60:40), whereas for hydro projects, an escalation rate of 5.47% (weightage WPI:CPI 25:75) is considered.

3.30 **Miscellaneous Provisions:** The CERC Tariff Regulations also provide clarity on several key issues:

- Sharing of gains from variations in norms
- Sharing of Non-Tariff Income
- Sharing of Clean Development Mechanism benefits
- Sharing of income from other business activities of transmission licensees
- Deviation from the ceiling tariff

3.31 **Power to relax and remove difficulties:** There may be issues not covered in the detailed tariff regulations that could impact the power sector. To address such issues, the Tariff Regulations include special provisions relating to (i) Power to Relax and (ii) Power to Remove Difficulty.

Airports Economic Regulatory Authority of India (AERA)

3.32 AERA was established as a statutory body post the enactment of the Airports Economic Regulatory Authority of India Act of 2008 [11] by the Parliament. The 2008 Act entrusts AERA with the primary responsibility of tariff regulation of the aeronautical services rendered at major airports (having annual passenger traffic or designated capacity of 3.5 million and above or notified by the Central Goverment) and monitoring of performance standards relating to quality, continuity and reliability of service. This is instrumental in creating a level playing field for various stakeholders (e.g. airport operators, independent service providers) and fostering a healthy competition amongst all major airports.

3.33 The Tariff regulation by AERA is driven by both national and international principles. Domestically, the Act of 2008 forms the structural backbone of tariff determination, enumerating various factors pertinent to the exercise, including:

(i) Capital expenditure and timely investment in improvement of airport facilities;
(ii) Service provided and its quality;
(iii) Cost for improving efficiency;
(iv) Economic and viable operation of major airports;
(v) Revenue from non-aeronautical services;
(vi) Concession offered by the Central Government.

Besides tariff setting, AERA also has the power to determine development fees and passenger service fee (PSF) levied under Aircraft Rules, 1937. Passenger Service Fee has two components viz., Security Component and Facilitation Component. PSF Facilitation Component was determined by AERA, and has now been subsumed in the User Development Fee.

3.34 Internationally, regulatory principles advocated by International Civil Aviation Organisation (ICAO) have significantly impacted AERA's regulatory framework with regards to policies on charges for airports & air navigation services (ICAO Doc 9082),[12] economic and financial management of airports (Airport Economic Manual -ICAO Doc 9562),[13] privatization of aviation sector (Manual on Privatization - ICAO Doc 9980)[14] and parity of airport charges for domestic and international airlines between contracting States (Chicago Convention 1944 - Article 15).[15]

3.35 Based upon the overarching principles mentioned above, AERA formulated the guidelines for tariff determination of services provided by airport operators, namely Terms and Conditions for Determination of Tariff for Airport Operators Guidelines, 2011.[16] Services that come in the ambit of regulation include the landing, housing or parking of an aircraft or any other ground facility offered in connection with aircraft operations at an airport; ground safety services at an airport; and ground handling services relating to aircraft, passengers. Similarly, the Terms and Conditions for Determination of Tariff for Services Provided for Cargo Facility, Ground Handling, and Supply of Fuel to the Aircraft Guidelines, 2011[17] are formulated for regulation of rates charged by independent service providers (ISPs). These, along with 10 supplementary guidelines issued subsequently, constitute the base reference for the tariff determination exercise.

3.36 In alignment with the ICAO principles for economic regulation of the Aviation Sector, the AERA guidelines ensure that:

1. Same rates are set for Indian/International airlines (non-discrimination);
2. Users are charged only for the services availed (cost relatedness);
3. Every regulatory decision is explained, documented & published (transparency); and
4. There exists a well defined user consultation process (user consultation)

Procedure for Tariff Approval

3.37 The following sections delve into the tariff determination exercise with regards to airport operators (AOs). AERA follows a similar approach for fixation of service rates of cargo, ground handling and supply of fuel to the aircraft at Major Airports. Coming to AOs, tariff is determined for the Control Period (CP), which consists of five years. In the first step, Multi Year Tariff Proposal (MYTP) is filed by the Airport Operator (AO) before AERA with the relevant projected financials (capital and operational costs, cash flows, asset investments, etc.). For existing Major Airports (brownfield airports), the MYTP of the Major Airport Operator also submits true-up (comparison of actual figures with the figures approved in Tariff Order of Previous CP) submissions of the previous CP, which includes actual financial figures of each regulatory building block for the preceding CP. True-up mechanism of tariff guidelines of AERA takes care of the under/over recovery of the ARR by the Airport Operator pertaining to the previous CP during the tariff determination exercise of the current CP. The exercise for determination of tariff for aeronautical services at Major Airport commences upon receipt of Multi Year Tariff Proposal from the Airport Operator and after examining the same, the proposals of AERA are put forth in the form of a Consultation Paper as mandated under ICAO Principles, AERA Act and AERA Guidelines. Extensive consultation is being held with all the stakeholders by scheduling a Consultation meeting during which participants offer their comments/views on the Consultation Paper. Written comments/views are also invited from all the stakeholders by giving reasonable time followed by an opportunity to Airport Operator for submission of counter comments. Upon receipt of the same, AERA, after detailed deliberations and analysis at its level finalizes its decisions which are well explained and documented in the Tariff Order, which is being published by Directorate General of Civil Aviation in the form of Aeronautical Information Circular.

Tariff Model

3.38 AERA follows two approaches for tariff determination of aeronautical services, namely cost plus approach and light touch approach (LTA). The former is used for arriving at tariffs of AOs and involves the recovery of costs and an additional return on capital employed. Whereas for fixation of service rates by independent service providers (ISPs), LTA is usually considered after assessing conditions of supply such as materiality (volume/quantity of service at the given airport as a proportion of total volume/quantity at all major airports), competition (2 or more ISPs providing the same service), and user agreements. For instance, if the service is deemed not material (ratio below a threshold minimum specified in the Guidelines) or material but competitive, LTA is followed.

AERA computes aggregate revenue requirement (ARR) of the AO for a given control period (CP) based on the following formula:

$$ARR = (FRoR * RABt) + Dt + Ot + Tt - \alpha * NARt$$

Where,

't': Tariff year in the CP, ranging from 1 to 5

ARRt : ARR for tariff year 't'
FRoR : Fair Rate of Return for the CP
RABt : Regulatory Asset Base (aeronautical) for year 't'
Dt : Depreciation of RAB for year 't'
Ot : Operation and maintenance expenditure (aeronautical) for year 't'
Tt : Taxation expense (aeronautical) for year 't'
α : Cross-subsidy factor for revenue from non-aeronautical services, α = 30%
NARt : Non-aeronautical revenue in year 't'

ARR is computed for the CP (consisting of five years). Thereafter, the present value (PV) of ARR (discounting cash flows for all the 5 tariff years of the CP) is summed and divided by the expected passenger traffic (this is based on projection with year-on-year growth rates in case of first CP and actual traffic in case of true-up). The figure arrived at is the yield per passenger (Y) with the formula as below, forming the basis of setting aeronautical tariffs:

Yield per passenger (Y) = Σ PV (ARRt) / Σ VEt
Where,
Summation (Σ) is done for year 't' from 1 to 5
PV (ARRt) : Present Value of ARR for all the tariff years
VEt : Passenger traffic in year 't'

Financial Variables (Regulatory Building Blocks)

3.39 AERA also considers similar fundamental financial variables (regulatory building blocks) as other regulators vested with the power of tariff determination. These variables include capital expenditure, regulatory asset base (RAB), depreciation, fair rate of return (FRoR) on RAB, return on land, operations and maintenance (O&M) expenses. Notably, non-aeronautical revenue (NAR) finds a place in ARR calculation. AERA follows a hybrid-till methodology in which 30% of revenue from non-aeronautical services (retail/commercial shops) is to be used by the AO to cross-subsidize the revenue requirement for providing aeronautical services. Balance 70% of NAR is retained by the AO. A brief description of the financial building blocks is as follows:

3.40 **Regulatory Asset Base (RAB):** RAB includes all the fixed aeronautical assets i.e. those used for provision of aeronautical services at the airport. Whereas assets which do not provide amenities/facilities/services related to the airport are excluded from the scope of RAB. Additionally, assets related to mandated security expenditure as laid down by the Government/Bureau of Civil Aviation Security (BCAS) are also considered a part of RAB. A normative gearing ratio (debt:equity) of 48:52 is considered as the efficient capital structure. However, AERA takes the submitted MYTP into consideration and allows a different capital structure after a detailed review.

3.41 **Fair Rate of Return (FRoR):** The FRoR is based on weighted average cost of capital for an AO and is computed for the MYTP using the formula as under:

FRoR= (g x Rd) + {(1-g) x Re}
Where;
g : Gearing ratio (debt/total cost)
Rd : Pre-tax cost of debt
Re : Post-tax cost of equity

The cost of equity is calculated based on the capital asset pricing model. A reference rate equal to 15.18% for cost of equity is used by AERA, which is based on an independent study done by the Indian Institute of Management (IIM) Bangalore.

3.42 **Cost of Debt:** The interest on debt submitted by the AO is admitted after a review by AERA. For the purpose of inclusion in the FRoR, the weighted average rate of interest for each year of the MYTP is considered.

3.43 **Capital Expenditure (Capex)/Additional Capital Expenditure (ACE):** Proposed capital expenditures (Capex) for the given MYTP is analyzed element-wise by AERA. Cost of major capex elements like apron, runway & terminal building is considered on normative cost or estimated cost basis, whichever is lower. Capex incurred for terminal building is divided into aeronautical and non-aeronautical activities (non- regulated activities) and only the aeronautical portion is considered for inclusion in RAB. AERA examines the proposed capital projects in detail for their essentiality, from the view point of AOs & passenger facilitation, and the reasonability of costs. After a thorough analysis, this capex/ACE is included in the forecasted RAB for the MYTP.

3.44 **Return on Capex/Additional Capital Expenditure(ACE):** After review, the admitted capex/ACE is added to the RAB for the control period and garners the FRoR (as described above) applicable on the RAB.

3.45 **Depreciation:** Depreciation is a constituent element of the ARR of AOs. AERA-issued regulatory order specifying the useful life and depreciation rates of aeronautical assets at the airport are used as reference for determining the depreciation amount per annum. For assets not listed in the regulatory order, the Companies Act is used as reference for useful life and rates. Further, land is considered a non-depreciable asset and is excluded from the cost of assets as a result. The straight-line method is to be used for calculation, considering the opening balance of all the asset additions and disposals during the year.

3.46 **Working Capital (WC):** AERA considers interest on short term loans, generally raised towards working capital with a maturity of less than one year, as operation and maintenance expenditure to address working capital requirement.

3.47 **Interest During Construction (IDC):** IDC is the interest on the capex loan pertaining to the construction period. This cost is capitalized and considered as a part of RAB, on which FRoR is applied.

3.48 **Operations & Maintenance (O&M) Expenditure:** O&M costs considered by AERA include employee cost, administration & general expenditure, repairs & maintenance (R&M) expenditure, utilities & outsourcing expenditure, other outflows etc. AERA allows up to 6% of opening RAB (net block) of each tariff year as normative R&M expenses on aeronautical assets. While truing-up, actual R&M expenditure is considered. Besides these routine items, interest on working capital for short term loans (less than or equal to 1 year), user development fees (UDF) collection charges, and compliance costs (directions received from Director General Civil Aviation - DGCA, statutory operating cost on account of fees, levies, taxes etc. directly imposed on AOs by regulatory agencies) are also considered a part of O&M expenses. AERA scrutinizes the O&M costs element-wise, with regards to the essentiality and the reasonability of the costs, only taking into account the expenses related to aeronautical services.

3.49 **Inflation Indexation:** The normative/estimated capex for the MYT period is escalated every year of the MYTP with the Wholesale Price Index (WPI) forecast published by the Reserve Bank of India (RBI). Similarly, the O&M costs are also annually indexed with the WPI forecast published by RBI while estimating for the control period.

3.50 **Return on Land:** Besides FRoR on RAB, AERA also allows return on land (used for aeronautical activities). If land is purchased by the AO (from private party or State Government), the compensation is given in the form of equated annual instalments at actual cost of debt or State Bank of India (SBI) base rate plus 2%, whichever is lower, for 30 years. In case of leased land, lease rent is allowed as a part of O&M cost, subject to reasonability. AERA also allows land development cost to AOs, wherever applicable. Return on land is not applicable if land is provided free of cost.

Petroleum and Natural Gas Regulatory Board (PNGRB)

3.51 PNGRB derives its authority from the Petroleum and Natural Gas Regulatory Board Act of 2006,[18] which notifies the guiding principles for determination of transportation tariff for common/contract carriers, city gas distribution (CGD) & local natural gas networks, petroleum and petroleum products pipelines, and natural gas pipelines (NGPL) as:

1. Factors representing competition, efficiency, economic use of the resources, good performance and optimum investments;
2. Safeguarding the consumer interest and at the same time ensuring recovery of transportation cost in a reasonable manner;
3. Rewarding efficiency in performance;
4. Connected transportation infrastructure such as compressors, pumps, metering units, storage etc;
5. Benchmarking against a reference tariff calculated based on cost of service, internal rate of return, net present value or alternate mode of transport.

3.52 The strategic reform towards 'One Nation, One Grid and One Tariff', envisages a uniform transportation rate levied to the end user and applicable to interconnected pipelines (together forming the national gas grid system). The uniform transportation rate has been categorised into three categories with single tariff for customers within 300 Kms Zone from source, within 300 to 1200 Kms zone from source and beyond 1200 kms. The same was done to support zone 1 customer (within zone 1 i.e. within 300 Kms from source) from sudden jump in tariff. However, Board is of the view that gradually the country should move towards a single unified tariff regime with a concept of one nation one tariff. With the implementation of a unified transportation tariff for integrated NGPL, year 2023 became a turning point for India's Natural Gas Sector. The advent of Unified transportation Tariff will ensure that, while the customers would pay the unified tariff, the operational entities will get the tariff as per their entitlement. The difference between the same will be settled between the pipeline entities as per the settlement mechanism notified by PNGRB. Provisions for implementation of the unified tariff are encoded in the Amendments of 2020, 2022 and 2023 to the aforementioned Principal Regulation of 2008. The unified tariffs are determined by PNGRB with a view to:

1. Encourage natural gas consumption in far flung areas;
2. Secure equitable distribution of natural gas;
3. Ensure simplification, stability and predictability in determination and simplification of tariffs;
4. Minimize the impact of additive transportation tariffs with respect to the tariff of integrated NGPL.

Besides the principles listed above, PNGRB adheres to the policies & directions issued by the Central Government from time to time. This report details the tariff determination exercise pertaining to NGPL. The PNGRB (Determination of Natural Gas Pipeline Tariff) Regulations, 2008 (consolidated up to April 15, 2024)[19] lay down the norms for arriving at the transportation tariff of NGPL which were commissioned in the pre-PNGRB period, since most projects which commenced operations in the post-PNGRB period were bid out with tariff conditions embedded in the bid documents.

Procedure for Tariff Approval

3.53 PNGRB follows an inclusive stakeholder consultative process before issuing the NGPL tariff order. The exercise begins with the submission of the tariff petition by the concerned entity, which contains all the technical, operating, financial and cost data of the project as mandated. After the receipt of the petition, PNGRB issues a public notice on its website containing a public consultation document and the tariff petition. This notice is easily and widely accessible to all stakeholders (pipeline users, general public, concerned entity) and provides them an opportunity to participate in the exercise. Stakeholders can submit their comments in writing within 15 days from the date of webhosting of the public notice.

Thereafter, PNGRB forwards the comments received to the entity concerned, which is required to submit its response within another 15 days of the communication from PNGRB. Post this, tariff hearings are scheduled for a detailed examination of the particulars of the petition, especially the financials. Stakeholders who have offered their comments are invited for discussions on comments and responses. Finally, the tariff order is issued after careful consideration of the tariff filing, and the comments & responses. Appeals against orders can be made in the Appellate Tribunal for Electricity (APTEL) within 30 days from the date of receipt of the order, with the discretionary power of APTEL to entertain an appeal after the expiry of 30 days if there exists sufficient cause for delay.

Tariff Model

3.54 PNGRB determines transportation tariff for older NGPL projects (commenced operations in the pre-PNGRB period) based on the cost plus methodology which focuses on recovery of operational costs plus a reasonable rate of return on the normative level of capital employed. In the post-PNGRB period, projects are awarded based on bids and tariff for these projects are as per bid terms. The discounted cash flow (DCF) model is followed for computation of tariff, wherein, cash inflows from projected revenue earnings (based on volumes considered i.e. actual or normative, whichever is higher) out of NGPL tariff are equated with outflows of capital and operating expenditures over the economic life of the project by discounting these flows at the project's reasonable rate of return. The gas volumes and cash outflows are estimated over the entire project life which results in the determination of the NGP tariff required to be earned by the project to achieve the internal rate of return (which is considered equal to the reasonable rate of return on capital). Therefore, the volume risk lies with the entity as maximum of actual or normative volumes is considered. The economic life of the pipeline is considered as 30 years (or granted extension for more than 30 years) from the date of commissioning of the project. The present value of the NGPL tariff is divided by the estimated volume of gas for the determination of the NGPL tariff per unit of gas over the project life. The volume is computed on a normative or actual basis, whichever is higher. The normative volume is considered at 75% of the NGPL capacity, out of which, for the first 10 years of operation, ramp-up is allowed from 30%-100% of the normative 75% volume (as per amendment in 2022). From the 11th year onwards, the entire 75% of NGPL capacity is considered.

Financial Variables

3.55 In a practice similar to its counterparts, PNGRB undertakes a thorough assessment of the major financial variables associated with a large infrastructure project such as project capital cost, return on capital, operations and maintenance costs, etc. The variables are estimated for the entire life of the project, which is considered as 30 years by PNGRB (this can vary based on any extensions granted to the NGPL project). Using the DCF model and the estimates of volumes to be transported, unit tariff is approved

for the project which is reviewed periodically to account for any recent developments which may have an impact on the cost. Below is a brief description of the variables and their treatment for the purposes of tariff determination of NGPL projects.

3.56 **Total Capital Employed (TCE):** TCE considered by PNGRB is equal to the gross fixed assets (GFA) in the project plus normative working capital less accumulated depreciation. The authorized entity (AE) is free to set the project financing (capital structure). PNGRB assesses the GFA submitted by the AE by taking into consideration factors such as capital costs of similar projects in India, infrastructure design & optimization, operating philosophy with respect to technical & safety standards (e.g. maximum allowable operating pressure) and appropriate available technology. Notably, the line pack value (value of the quantity of natural gas stored within the pipeline system) is considered as a non-depreciating fixed asset (FA) and is included in TCE.

3.57 **Capital Expenditure (Capex)/Additional Capital Expenditure (ACE):** Any capex/ACE on fixed assets (tangible assets with operating life of more than 1 year which are integral to revenue generation through tariff) is included in the TCE. Fixed assets (FAs) are considered on 'rolling basis' (accounting for beginning balance, additions, disposals, transfers, and ending balance for specified time period) till the end of economic life of the NGPL project. Expenditure on improvements, modifications, replacement, land bought and used for facilities essential to NGPL are considered as capex on FAs. Whereas investments in securities, goodwill, current assets, accumulated loss not written-off, work-in-progress, change in historical cost of FA due to revaluation or capitalization of losses, land purchased for future use (e.g. capacity expansion of project) are excluded.

3.58 **Interest During Construction (IDC) and Incidental Expenditure During Construction (IEDC):** IDC is the interest cost of debt used to fund a project before it is completed and begins revenue generation (cash inflows). PNGRB already allows 12% post tax RoCE on the TCE (which includes assets built during project construction). Therefore, allowing IDC as well as RoCE from the date of cash outflow will amount to duplication. Thus, IDC is not considered for recovery through tariff. Whereas IEDC is considered as a part of capital expenditure.

3.59 **Return on Capital Employed (RoCE):** PNGRB permits RoCE that yields the equivalent of 12% post-tax RoCE (applicable lowest nominal rate of income tax is used for grossing-up RoCE which yields 12% post-tax return). RoCE, which is applied on the admitted TCE (as above) and is effective from the date of cash outflows, remains fixed for the entire economic life of the NGPL project.

3.60 **Return on Capex/Additional Capital Expenditure(ACE):** Capex/ACE on FAs becomes a part of the TCE and garners the same RoCE (12% post-tax) as that applicable on the TCE.

3.61 **Cost of Debt:** Interest on loans are not considered for tariff determination in the DCF model. However, the permitted RoCE, as detailed above, covers the cost of both debt and equity.

3.62 **Depreciation:** Depreciation is not directly used for tariff computation through the DCF model. However, it factors into the calculation of TCE on which RoCE is applied.

3.63 **Working Capital (WC) and Interest on WC:** PNGRB allows a normative WC equal to 30 days of operating costs (excluding depreciation) and 18 days of NGPL tariff receivables. This amount is capitalized and included in the TCE for application of the RoCE. As working capital is included in the TCE, interest on working capital is not relevant.

3.64 **Operations & Maintenance (O&M) Expenditure:** Expenses necessary for the proper upkeep and maintenance of tangible assets of the NGPL project constitute the O&M costs. These costs are computed by the AE on actual basis or assessed on normative basis by PNGRB (whichever is lower) and form a part of cash outflows in the DCF model. Costs such as consumables, utilities (power, fuel including system usage gas at a maximum 2% of volumes, water, transmission loss at 0.1% of actual volumes), salaries and wage, repairs and maintenance, insurance premiums on assets, administrative overheads are elements of the O&M costs. Charges such as normal bank charges, bank guarantee charges, and performance bonds required as per the terms of authorization are also included. Whereas financial costs like interest on loans, bad debts, sales promotion, advertisement expenses (except for tenders), expenditure incurred in raising or servicing of capital/debenture/bond (or any debt), exchange variation on revenue account are not considered for recovery through tariff. Notably, miscellaneous income earned by the AE is adjusted from O&M costs in case the entity is making returns greater than 12%.

3.65 **Inflation Indexation:** PNGRB allows 4.5% annual escalation on operating costs for future. The actual costs are trued up during tariff review.

Tariff Authority for Major Ports (TAMP)

3.66 TAMP was constituted in April 1997 under the Major Ports Trust Act of 1963.[20] The 1963 Act was amended by the Port Laws (Amendment) Act of 1997 to establish an independent authority for regulating all tariffs, both vessel & cargo related, and rates for lease of properties in respect of Major Port Trusts (MPTs) and private operators/Public Private Partnership (PPP) concessionaires located therein. The PPP concessionaires include various arrangements adopted by the Government for project implementation such as build-operate-transfer (BOT) and build-own-operate-transfer (BOOT).

3.67 TAMP discharged its tariff setting functions following the Tariff Guidelines issued by the Government from time to time over the years, applicable to different sets of stakeholders and accounting for sectoral evolution over time. The first of these were the Guidelines for Regulation of Tariff at Major Ports 2004[21] or the 2005 Tariff Guidelines (applicable on major ports, private BOT/BOOT terminal operators, service providers Pre-2008). Subsequently, Tariff Guidelines, 2008[22] for upfront tariff setting for PPP projects at Major Port (applicable to PPP projects for which bids are invited by setting tariff caps upfront), Reference Tariff Guidelines 2013,[23] Tariff Guidelines 2019 (applicable for BOT concessionaires governed under the 2005 Tariff Guidelines)[24] were issued by the Government and followed by TAMP.

3.68 The 2005 Tariff Guidelines lay down the overall approach which guides the tariff setting exercise by TAMP. With the long term vision of facilitating competitive pricing and pushing performance of Indian Ports to internationally competitive levels, TAMP is guided by the following principles:

1. Safeguarding the interest of shippers/consignees and other port users;
2. Ensuring just and fair return to ports;
3. Encouraging competition, economical use of resources, efficiency in performance and optimum investment;
4. Following established costing methodologies (including cost plus approach) and pricing principles;
5. Transparency and participative approach;
6. Improvement in operational efficiency of the ports;

3.69 The 2005 guidelines fix the responsibility of TAMP to apply uniform norms, concepts, principles and approach of tariff setting at all ports. Prior to the Major Port Authorities (MPA) Act 2021, TAMP was the regulatory authority for determining tariffs for all the major ports and for services related to cargo, containers, vessels, etc. Post 2021 TAMP no longer fixes tariffs of major ports and build-operate-transfer (BOT) operators instead, it has been vested with powers to adjudicate disputes between major ports, BOT operators and users fraternity. Consequently, the analysis of tariff determination principles and procedures in this report is based on the methodology followed by TAMP prior to November 2021, when the MPA Act 2021 came into force. The aforementioned 2019 Tariff Guidelines have been used as the frame of reference for examining the tariff model and treatment of financial variables as per TAMP norms.

Procedure for Tariff Approval

3.70 The process of tariff determination begins with the submission of the proposed scale of rates (SOR) - the service rates charged by the BOT operator. The submission is to be made 60 days prior to the expected date of implementation of the proposed SOR, along with conditionalities governing the services rendered. Following its practice of stakeholder consultation, TAMP forwards the proposal to the concerned major port (where the BOT operator is functioning) and representative bodies of port users/user

associations for their comments. The BOT operator is required to submit its replies on the comments within 15 days from the last date of receipt of comments. Thereafter, TAMP sets up a hearing (s) with all the concerned stakeholders (BOT operator, MPT, port users) based on which TAMP issues order and notifies the SOR. Normally, the approved SOR comes into effect after 30 days from the date of notification and remains valid for 3 years (subject to annual indexation). A tariff order may be considered for review by TAMP to the extent of errors apparent on the face of records considered in the relevant proceedings, or for any other justifiable reasons. For consideration, the review application must be filed within 30 days of the notification of SOR. TAMP passes a speaking order within 60 days of the filing of the review application.

Tariff Model

3.71 TAMP follows the Annual Revenue Requirement (ARR) model for determining the tariff, or Scale Of Rates (SOR), charged by BOT operators operating in major ports. The SOR for various facilities and services provided by the PPP concessionaire (BOT operator) is based on the estimate of the ceiling ARR, and remains valid for a period of 3 years for PPP Concessionaires governed under Tariff Guidelines 2019 (erstwhile governed under Tariff Guidelines 2005). The 2019 Tariff Guidelines specify the method of ARR calculation which is to be submitted in the proposal by the concerned BOT operator. ARR estimate for the upcoming financial year (Y4) is arrived at by averaging the actual audited expenditure in the previous 3 years (Y1, Y2, Y3) of the BOT operator, and adding return on capital employed to it.

ARR Y4 = (AE Y1 +AE Y2 +AE Y3)/3 + RoCE*TCE
ATE Yt : Actual total expenditure for immediate preceding three years Y1, Y2 and Y3
RoCE: 16% return on capital employed
TCE: Total capital employed (as on March 31/December 31 of year Y3)

3.72 The ARR for Y4 is then indexed by the Wholesale Price Index (WPI) forecast published by the Reserve Bank of India (RBI) for the given year to arrive at the ceiling ARR. This ceiling ARR acts as an upper limit for fixation of SOR of the operator who has the flexibility to fix the SOR anywhere within the approved ceiling ARR in order to respond to the market forces and in exercise of its commercial judgement. For drawing the SOR, the average of the actual traffic handled by the BOT operator during the years Y1, Y2 and Y3 (duly certified by the concerned MPT) is used. This ceiling SOR is automatically indexed annually up to 60% of variation in WPI occurring between January 1 to December 31 of the relevant financial year.

Financial Variables

3.73 In the ARR tariff model followed by TAMP, the actual expenditures (AE) incurred by the operator in the immediately preceding 3 years serve as the benchmark for estimating the ARR in the upcoming financial year.

AE, along with returns on the capital employed, are considered the cash flow due to the operator, which is to be recovered through SOR. Various items form a part of AE, the major one being the operations and maintenance costs related to provision of services and facilities. But components such as royalty/revenue share payment (to the extent not admissible for tariff fixation), interest on loans, provisions for bad and doubtful debts, provision for slow moving inventory, etc. are excluded from AE and thus not passed through to the SOR. The parameters mentioned below broadly enunciate the Tariff Guidelines 2019 for BOT operators (previously governed under 2005 Tariff Guidelines guidelines).

3.74 **Total Capital Employed (TCE):** For applying the return on capital employed (RoCE), the capital base considered by TAMP includes gross fixed assets (property, plant, equipment etc.) as on March 31/December 31 of Y3 (computed using Indian Generally Accepted Accounting Principles-IGAAP), capital work in progress (CWIP) as on March 31/December 31 of Y3 as per audited annual accounts, and working capital. The 16% ROCE captures debt equity ratio (gearing ratio) of 50:50.

3.75 **Capital Expenditure (Capex)/Additional Capital Expenditure (ACE):** Capex/ACE incurred during preceding 3 years forms a part of the gross fixed assets (GFAs) if the asset is commissioned. GFAs and CWIP as reflected in the audited annual accounts of the Y3 year and working capital as per norms prescribed forms the Total Capital Employed for completion of return.

3.76 **Interest During Construction (IDC) and Incidental Expenditure During Construction (IEDC):** All capital expenditure incurred during the construction phase and up to commencement of operations is capitalized and forms part of the gross block of assets/TCE on which RoCE is applicable. Hence, IDC and IEDC not considered separately.

3.77 **Return on Capital Employed (RoCE):** TAMP permits 16% pre-tax RoCE to be applicable on the admitted TCE (as above). This is arrived at in accordance with the Capital Asset Pricing Model (CAPM). Some of the key parameters in the CAPM include risk free rate (based on yields of 10 year GoI bonds), market risk premium (based on a review of various methods for calculating the risk premium in Indian context), the equity beta which denotes asset volatility relative to market volatility (based on the review of asset betas of Ports Sector and other domestic companies), industry gearing ratio (considered as 1:1), debt risk premium (based on the risk profile of the port sector as assessed as 'investment grade'), and corporate tax rate as per the Income Tax Act and rules thereunder.

3.78 **Return on Capex/Additional Capital Expenditure (ACE):** The same RoCE (16% pre-tax) as mentioned above is applicable on the admitted capex/ACE during the previous 3 years.

3.79 **Cost of Debt:** While the (pre-tax) cost of debt is included in the computation of normative RoCE figure using CAPM, interest on loans is not considered for ceiling ARR determination. This is because the TCE, on which the RoCE is applicable, already includes the debt component of the cost associated with TCE and allowing both RoCE and interest on loan for recovery through SOR would amount to duplication.

3.80 **Depreciation:** Depreciation submitted by the BOT operator as per audited annual accounts (Indian Accounting Standard-IND AS) is considered by TAMP. In case of variation reported under IND AS and IGAAP, IGAAP figures are to be considered as final. The written down value method specified in the Companies Act 2013 is used for calculation of depreciation.

3.81 **Working Capital (WC):** WC is a constituent element of the TCE and is allowed on a normative basis. Components of WC considered by TAMP include inventory (capital spares equivalent to 1 year's average consumption and other inventory, excluding fuel, equivalent to 6 months' average requirement); sundry debtors (advance payments of revenue share/royalty and lease rental/license fee to landlord port flowing from contractual obligations); and cash equivalent to 1 month expenses.

3.82 **Interest on WC:** As Working Capital included in Capital employed interest on working capital is not relevant.

3.83 **Operations & Maintenance (O&M) Expenditure:** Operating expenses of preceding 3 years as per audited annual accounts form the major head under actual expenditure for calculation of ceiling ARR.

3.84 **Inflation Indexation:** The ARR estimate for upcoming financial year Y4 (assessed as on March 31/December 31 of Y3) submitted by the BOT operator is indexed by 100% of Wholesale Price Index (WPI) forecast by the Reserve Bank of India for the year Y4. The ceiling SOR (based on average of actual port traffic for the last 3 years and having ceiling ARR as the upper limit) is indexed annually to inflation up to 60% of variation in WPI (announced by GoI occurring between January 1 to December 31 of the relevant year).

Comparison of tariff determination principles of CERC, AERA, PNGRB and TAMP (Before 2021)

3.85 Based on inputs received from CERC, AERA, PNGRB and TAMP (Before 2021), a comparative table has been prepared, which compares the tariff determination process and principles across the four regulatory bodies.

COMPARATIVE CHART OF FINANCIAL VARIABLES FOR TARIFF DETERMINATION

(a) Approval of the Capital Cost

S. No.	Parameter	Regulatory Body			
		CERC*	AERA@	PNGRB#	TAMP**
1.	**Periodicity of Fixation**	5 years	5 years	5 years (May be less based on the change in certain parameters as per Regulations)	3 years
2.	**Approach Used**	Cost of Service (Hybrid: some of the Tariff components are normative)	Cost of Service	Discounted Cash Flow	Cost of Service
3.	**Broad Principles of Return**	ROE Approach	ROCE Approach	ROCE Approach	ROCE Approach
4.	**Capital Structure**	Normative Capital structure (Debt: Equity): 70:30	Normative Capital structure (Debt: Equity): 48:52	Authorized Entity (AE) free to set capital structure	Normative Capital structure (Debt: Equity): 50:50

S. No.	Parameter	Regulatory Body			
		CERC*	AERA@	PNGRB#	TAMP**
5.	**Rate Base: Determination of the capital cost/Asset base**	Capital Cost of Projects Major capital cost elements (new projects): Cost of Land, Cost of Plant & machinery, ROW Cost and other infrastructure such as water, road and R&R plus **Soft Cost:** Interest During Construction, Normative IDC and IEDC (Generally Capital cost as per Investment approval subject to prudence check)	Regulatory Asset Base (RAB) All the fixed asset i.e. aeronautical assets for aeronautical services at the airport. Initial RAB value (for first control period): OC* - AD - ACR - AVA - LVA OC: Original Cost of Fixed Assets; AD: Accumulated Depreciation; ACR: Accumulated Capital Receipts of stakeholder contributions; AVA, LVA: Asset & Land Value Adjustments for assets excluded from RAB	Total Capital Employed Value of Total Capital Employed: Gross Fixed Assets* - Accumulated Depreciation (on date of coming pipeline under PNGRB's purview) + Normative Working Capital Soft Cost: Incidental Expenditure During Construction part of capex outflows; Interest During Construction not allowed for tariff (to avoid duplication since 12% Return on Capital Employed already allowed on capital base)	Total Capital Employed Capital Employed = Gross Fixed Assets (Build-Operate-Transfer) + Capital Work-in-Progress + Working Capital

S. No.	Parameter	Regulatory Body			
		CERC*	AERA@	PNGRB#	TAMP**
			IDC considered as part of RAB *Only aeronautical services related Capex is considered	*Gross Fixed assets are valued at lower of normative value or historical value and are benchmarked vis-à-vis other similar projects in India	
6.	**Additional capital expenditure**	Separate provisions for Additional Capital Expenditure for up to cut-off date and beyond original scope	Capital expenditure (during year 't') submitted by Airport Operator (AO) is a part of work in progress assets (WIPA) and included in forecast RAB for application of RoCE	Natural Gas Pipeline (NGPL) capex and additional capex projections submitted by Authorised Entity included as part of Total Capital Employed for application of Return on Capital Employed	Gross fixed assets and capital work-in-progress are a part of TCE for application of RoCE

(b) Components of Tariff

S. No.	Parameter	Regulatory Body			
		CERC*	AERA@	PNGRB#	TAMP**
1.	**(a) Return on Equity (RoE)/Capital Employed (RoCE)**	Post Tax Return on Equity (RoE) i) Transmission-15.00% ii) Thermal-15.50% iii) Hydro with storage-17.00% Post tax on equity component (maximum 30% of capital or actual whichever is lower) of Capital Cost	Return on Capital Employed Fair Rate of Return (FRoR) on RAB = (gXRd) + (1-g)XRe g: gearing ratio (debt/total cost); Rd : pre-tax cost of debt; Re : post-tax cost of equity Benchmark Re rate 15.18% (referenced from an IIM Bangalore study based on 5 PPP Airports) considered	Return on Capital Employed 12% post-tax on Total Capital Employed	Return on Capital Employed 16% pre-tax on TCE
	(b) Return on Additional Capital Expenditure	For additional capitalization within original scope of work: RoE as mentioned in 1(a) above	Calculated FRoR (as above)	12% post-tax Return on Capital Employed	16% pre-tax RoCE

S. No.	Parameter	Regulatory Body			
		CERC*	AERA@	PNGRB#	TAMP**
		Beyond original scope, Force Majeure and Change in Law: 1-year MCLR of SBI plus 350 basis points as on April 1 of the relevant year (14% ceiling)			
2.	**Cost of debt**	Interest on loan: Weighted average rate of interest (WARoI) of actual/allocated loan portfolio; If no project loan: WARoI of company loan portfolio; if no company loan: 1-year marginal cost of lending rate (MCLR) of State Bank of India (SBI) on April 1 of relevant financial year	While computing FRoR pre-tax Debt cost forecast submitted by Airport Operator (AO) are allowed after a review of sources, procedures and methods used for raising debt; At present, AERA is adopting debt @ 9% or actual rate whichever is less	Return on Capital Employed is allowed @12% post tax, thus, Interest on loans not considered	RoCE is allowed @16% pre tax, thus, Interest on loans not considered separately

S. No	Parameter		Regulatory Body			
			CERC*	AERA@	PNGRB#	TAMP**
3.	**Depreciation**	Life of Project	Thermal: 25 years Hydro: 40 years Small Hydro Project: 25 to 30 years	Estimates of asset life based on regulatory order^ or Companies Act.	30 years (Natural gas Pipeline) or authorized extension	As per Companies Act
		Method used	Straight Line Method	Straight Line Method	Since Discounted Cash flow used Depreciation is not relevant	Written Down Value (Concessionaire)/ Straight Line Method (Major Ports)
		Other details	Salvage value: 10% (5% for integrated mines, 0% for IT assets); depreciation rate based on debt repayment period of 12/15 years and Straight-line method (SLM).	Residual asset value: 10%; depreciation rates based on regulatory order^ or Companies Act, 1956	Residual asset Value: i) Pipelines: 5% (life 30 years) ii) Other Assets: As per Companies Act, 1956 Depreciation rates: based on Sch. VI of The Companies Act,1956	Depreciation calculated as per Companies Act, 2013; if variation in IND AS and IGAAP figures submitted by BOT operator, IGAAP figures considered final
4.	**Interest on Working Capital (WC)**	Working Capital Components	Details of components of Working Capital		Normative WC equal to 30 days of operating costs	Inventory (capital spares for 1 year and other inventory

S. No.	Parameter		Regulatory Body			
			CERC*	AERA@	PNGRB#	TAMP**
	Interest on Working Capital (WC)		specified in the Tariff Regulations (Cost of input stock (10-20 days); 30 days advance payment towards input stock; cost of maintenance spares (as a percentage of O&M Expenses); 1month of O&M expenses; Receivables including fixed and variable charges equivalent to 45 days)	Interest on working capital for short term loans not more than twelve months is considered under the head "Operating and Maintenance Expenses"	(excluding depreciation) and 18 days of tariff receivables	for 6 months); Sundry debtors; one month cash expenses)
		Rate	Reference rate (i.e. SBI MCLR + 325 basis point) of interest (RoI) i.e. SBI MCLR on April 1 of respective tariff year		Not Applicable, as Working Capital included in Capital employed	Not Applicable (As Working Capital included in Capital employed)

S. No.	Parameter		Regulatory Body			
			CERC*	AERA@	PNGRB#	TAMP**
5.	**Operations & Maintenance (O&M) Expenditure**	O &M Cost components	Manpower; repairs and maintenance spares; other spares of capital nature up to Rs 10 lakhs; additional capex of individual asset costing less than Rs 20 lakhs; consumables; insurance and overheads; fuel other than used for generation of electricity	Employee Cost; Administration & General Expenditure; Repairs & Maintenance; Utilities & Outsourcing; Interest on WC loans less than 1 year; Other outflows	Consumables; utilities; salaries and wage; repairs and maintenance; insurance premia on assets; administrative overheads	O&M cost components (including depreciation) as per audited annual accounts considered part of actual expenditure and admitted after review;
		Other Considerations	Normative O&M expenses specified for different projects (thermal, hydro, transmission)	AO-submitted O&M costs reviewed and admitted considering actual costs in last audited accounts; efficiency and productivity Improvements;	O&M costs part of cash outflows and computed by AE on actual basis or assessed on normative basis by PNGRB (whichever is lower)	Exclusions include royalty/revenue share paid to the port, interest on loans, provision for bad/doubtful debts and slow moving inventory

S.No	Parameter		Regulatory Body			
			CERC*	AERA@	PNGRB#	TAMP**
				statutory and compliance costs (by regulatory agencies such as Director General of Civil Aviation)		
	Operations & Maintenance (O&M) Expenditure	Inflation Indexation	5.25% - 5.47% of O&M expenses annual escalation rate for different types of projects (hydro, integrated mines, thermal station emission control system) during the Control period	Reserve Bank of India's Wholesale Price Index (WPI) forecast used as reference (applicable on operating and capital expenses)	4.5% annual escalation on operating costs allowed for future. Trued up based on actuals.	Ceiling ARR indexed by 100% of WPI; ceiling Scale of Rates indexed by upto 60% variation in WPI (between Jan 1-Dec 31 of relevant year as announced by Government of India)

S. No.	Parameter		Regulatory Body			
			CERC*	AERA@	PNGRB#	TAMP**
6.	**Miscellaneous**	Sharing of non-tariff income	The non-tariff net income in case of generating station and transmission system from rent of land or buildings, eco-tourism, sale of scrap, and advertisements shared between the generating company or the transmission licensee and the beneficiaries in the ratio of 1:1. Sharing of gains due to variations in operational norms: The financial gains by the generating company or the transmission licensee,	30% of Revenue from Service other than aeronautical services is excluded while determining ARR	Shared in case the return on capital employed goes above 12% post tax return.	NA

S. No.	Parameter		Regulatory Body			
			CERC*	AERA@	PNGRB#	TAMP**
	Miscellaneous		on account of controllable parameters viz. Station Heat Rate; Secondary Fuel Oil; Consumption and Auxiliary Energy Consumption shall be shared between the generating company or transmission licensee and the beneficiaries or long term customers, on an annual basis in the ratio of 1:1 Sharing of savings in interest due to re-financing or restructuring of loan If refinancing or restructuring of loan, results in net savings			

S. No.	Parameter		Regulatory Body			
			CERC*	AERA@	PNGRB#	TAMP**
	Miscellaneous		on interest after accounting for cost associated with such refinancing or restructuring, the same shall be shared between the generating company or the transmission licensee and the beneficiaries in the ratio of 1:1.			

*As per the 2024 Tariff Regulations
@Based on the Airport Economic Regulatory Act 2008 and the "Terms and Conditions for Determination of Tariff for Airport Operators Guidelines, 2011"
PNGRB (Determination of Natural Gas Pipeline Tariff) Regulations, 2008
**Before deregulation of tariffs (enactment of Major Port Authorities Act, 2021). The details given reflect the parameters with reference to Tariff Guidelines 2019 only. For comparison of parameters under other Guidelines followed by TAMP, the Tariff Determination inputs from TAMP in the 'Volume of Inputs' of the Report (available on the FOIR website) may be referred.
^AERA regulatory order for useful economic life and depreciation of aeronautical assets
IndAS- Indian Accounting Standards
IGAAP-Indian Generally Accepted Accounting Principles

3.86 Based on the above discussion, following major differences/ similarities in tariff determination principles can be inferred:

i) **Periodicity of Fixation:** While CERC, PNGRB & AERA use a 5 yearly control period for notification of tariffs, the duration has been kept as 3 years by TAMP. PNGRB may allow the notified period for a shorter period depending upon the circumstances.

ii) Approach Used: All the regulators use a cost of service approach to determine the tariff except PNGRB which follows DCF method. This approach considers the actual costs incurred by the regulated entities. These costs typically include operation and maintenance (O&M) expenses, depreciation, return on equity (ROE), and interest on debt. By allowing the regulated entity to recover these costs through the tariff, the cost of service approach aims to ensure the financial viability of the entity and incentivize investment in the sector.

iii) Return on Equity (ROE)/ Return on Capital Employed (ROCE): CERC employs ROE approach, whereas TAMP, AERA, and PNGRB use the ROCE approach.

iv) Capital structure: CERC regulates the capital structure for tariff determination, with a debt-to-equity ratio of 70:30. AERA uses a normative capital structure having debt-to-equity ratio of 48:52. PNGRB allows the authorized entity (AE) to set its own capital structure. TAMP used a normative capital structure of 50:50 debt-to-equity.

(v) Regulatory Asset Base (RAB)/Total Capital Employed (TCE): CERC and AERA consider RAB as all the fixed assets which, includes assets such as power plants, transmission lines, airport infrastructure, and airport facilities. PNGRB and TAMP consider the Total Capital Employed (TCE) as the value of gross fixed assets minus accumulated depreciation plus major capital cost. In case of PNGRB, the TCE also includes normative working capital elements to account for the ongoing operational expenses.

(vi) Additional Capital Expenditure (Capex): PNGRB, AERA and TAMP allow inclusion capital expenditure during the year in the forecasted Regulatory Asset Base/Total capital Employed for calculating the RoCE. CERC allows separate provisions for additional capital expenditure for up to the cut-off period and beyond the cut-off date. This distinction allows for more flexibility in accommodating future investments, but it also introduces some complexity in the tariff calculation process.

(vii) Return on Equity (RoE): CERC regulates the post-tax RoE for different types of transmission and generation assets. This allows for a more nuanced approach that considers the specific risks associated with different types of investments. AERA regulates the return on capital employed (RoCE), which is a post-tax return that considers both the equity and debt financing of the airport operator and determines the fair rate of return (FRoR) based on a gearing ratio (debt-to-total cost ratio) and pre-tax cost of debt and post tax cost of equity. The FRoR is then converted to a post-tax return using a pre-defined tax rate. PNGRB & TAMP use a benchmark rate of return on capital employed (RoCE). This benchmark RoCE is pre-determined by the regulator and is intended to reflect the risk profile of the port sector. TAMP provide for pre-tax return on capital employed.

(viii) Cost of Debt: CERC uses the weighted average rate of interest (WARoI) of the actual loan portfolio, project loan, or the MCLR of SBI on April 1st of the relevant financial year. The MCLR (marginal cost of funds based lending rate) is a benchmark lending rate set by banks in India.

AERA considers the debt cost forecast submitted by the airport operator (AO) after a review of the sources, procedures, and methods used for raising debt. PNGRB uses RoCE, which includes the cost of debt. TAMP does not consider the cost of debt separately as it is already factored into the benchmark RoCE.

(ix) Depreciation: CERC, AERA and TAMP use the straight-line method for depreciation. PNGRB uses DCF method for tariff and accordingly, doesn't provide for Depreciation separately.

(x) Determination of Useful Life: The specific useful life for different types of assets is typically defined by the regulatory body or by the Companies Act. These useful lives are based on industry standards and engineering estimates of the asset's operational lifespan. CERC, AERA, PNGRB, and TAMP may all have slightly different schedules for various asset categories.

(xi) Interest on Working Capital: CERC specifies working capital as a function of cost of input stock, advance payment towards input stock, cost of maintenance spares, operation and maintenance expenses, and receivables. TAMP defines the working capital as equal to 30 days of operating costs, inventory including capital spares for 1 year and other inventory for 6 months, sundry debtors and one month cash expenses. Under AERA's approach, the applicant submitting the tariff proposal specifies the Interest on WC amount. AERA then reviews this proposed Interest on WC and, if deemed reasonable, incorporates it into the operating expenses. PNGRB approach uses Normative Working Capital as 30 days of operating costs & 18 days of Tariff receivables, excluding the depreciation. Working capital is included in the TCE and therefore, Interest on working capital is not considered separately.

(xii) Operations & Maintenance Expenses: CERC, AERA and TAMP specifically define the components to be considered by the entity as a part of Operations & Maintenance Expenses, while simultaneously evaluating them as per normative standards and prudence checks. However, TAMP allows the O&M costs as per audited books while making some exclusions.

3.87 To promote knowledge sharing and collaboration, the Working Group recommends bi-annual meetings (once every six months) for Members (Finance) from all member bodies of FOIR. These meetings will provide a platform to discuss and learn from each other's financial practices, ultimately strengthening the overall financial management.

PART-C
INTER- REGULATOR COOPERATION

4.1 The scale and nature of contemporary challenges faced by nations today necessitate the development and execution of solutions in a coordinated manner. Therefore, the need for collaborative endeavours needs no emphasis. For instance, the COVID-19 pandemic. It highlighted the need for collective action to tackle global threats and ensure the flow of essential goods and services. Also, the pace of technological advancement is incredibly fast, and each development materialized in a particular sector can be leveraged to its best use in other sectors. Collaborative exercises can unravel the complexity associated with underlying processes, revealing new dimensions beyond initial assumptions. Indeed, sharing best practices can be replicated across sectors to enhance overall processes.

Cooperation between the Government Ministries and Departments

4.2 The Government of India, in pursuit of better governance, has incorporated several vertical sectors into various working groups to facilitate collective action and problem-solving. Some of the examples of such committees and working groups include:

- In 2020, the Ministry of Environment, Forest and Climate Change (MoEFCC) established the **Apex Committee for Implementation of the Paris Agreement (AIPA)**[25] to ensure India meets its climate commitments under the Paris Agreement, including its Nationally Determined Contributions (NDCs). Chaired by the Secretary of MoEFCC, AIPA includes senior officials from 14 ministries. Its tasks include overseeing NDC implementation, regulating carbon markets under Article 6 of the Paris Agreement, and providing guidelines on carbon pricing and market mechanisms. AIPA will coordinate national and private sector efforts to align with climate goals, reinforcing India's climate leadership and commitment. The results are evident, with the government being at advanced stages of introducing carbon markets in India.

- In 2021, the Honorable Prime Minister launched the **Gati Shakti – National Master Plan for Multi-modal Connectivity,**[26] **uniting 16 ministries, including Railways and Roadways**, to facilitate integrated planning and coordinated implementation of infrastructure connectivity projects. Inter-ministerial coordination offers key benefits, including holistic infrastructure planning and development, inter-sectoral synergies, efficient resource utilization, streamlined clearances for environmental, forest, and wildlife matters, and reduced logistics costs, enhancing price competitiveness.

- **Artificial Intelligence (AI)** is expected to change the way we work and live. In view of its positive impact on the economy, the technology is being embraced by countries across the world. Its proliferation is being regarded as the fourth industrial revolution. The Government of India, realizing its importance, **constituted four committees of sectoral and government experts**[27] in 2018 to promote Artificial Intelligence (AI) initiatives and develop a policy framework:

1. Committee on Platforms and Data for AI
2. Committee on Leveraging AI for Identifying National Missions in Key Sectors
3. Committee on Mapping Technological capabilities, Key Policy enablers required across sectors. Skilling and Re-skilling, R & D
4. Committee on Cyber Security, Safety, Legal and Ethical Issues

The committee's reports are available in the public domain. Tremendous benefits, as well as detrimental use cases, have been found to be innate to the technology. Therefore, the Government of India plans to set up an Inter-Ministerial Committee to regulate the technology. This is seen as having immense scope since such technology has the capacity to benefit each sector and each one of us, as well as the capacity to make us vulnerable. The appropriate committee, when constituted, would have a very important role to play and would need to develop regulatory measures to ensure compliance with appropriate use cases.

Cooperation amongst Regulators and between Government & Regulators

4.3 It is evident that regulations impact each action and inaction. With the deep-seated benefits accounted for in collaborative efforts, the Government of India and regulators come together on overlapping issues to address them effectively.

- In December, 2010, Government of India constituted non-statutory apex body the **Financial Stability and Development Council (FSDC)** chaired by the Union Finance Minister, its regulatory members include the Reserve Bank of India (RBI), the Securities and Exchange Board of India (SEBI), the Insurance Regulatory and Development Authority (IRDAI), and the Pension Fund Regulatory and Development Authority (PFRDA). The Council addresses financial stability, sector development, inter-regulatory coordination, financial literacy, inclusion, and macro-prudential supervision, including oversight of large financial conglomerates.

- Telecom Regulatory Authority of India (TRAI), the Reserve Bank of India (RBI), the Securities & Exchange Board of India (SEBI), and ministries such as the Ministry of Consumer Affairs (MoCA), Ministry of Home Affairs (MHA), and the Department of Telecommunications (DoT), are collaborating to address the issue of pesky calls and online frauds. On May 21, 2024, TRAI convened a meeting of the **Joint Committee of Regulators (JCoR),** which includes RBI, SEBI, and MoCA as members, with DoT and MHA representatives as special invitees. The JCoR aims to explore regulatory implications in the digital realm, focusing on curbing spam, particularly through voice calls. This collaborative effort emphasizes the necessity for a unified approach to effectively implement measures to combat these issues within a specified timeframe.

- FOIR, as part of its various activities, has benefited from its previous collaboration between TRAI and electricity regulators in 2020-2021. This collaboration led to the successful deployment of 5G technology and addressed various issues faced by telecom service providers. Numerous benefits were accrued through this cooperation. Subsequently, this collaboration was extended to the Forum of Regulators, and its outcomes were acknowledged and supported by the Ministries.

- Leveraging on this success, FOIR in 2024 constituted a **Technical Working Group** with its member regulators — TRAI, PNGRB, CERC, TAMP, and CCI — along with Special Invitees from CEA, AAI, and the Railway Board. This group aims to assess and facilitate the adoption of 5G communication and information technologies across various industry verticals. The group is conducting techno-commercial and regulatory analysis to identify optimal use cases for fast communication services within industries and services. By identifying and addressing regulatory bottlenecks, they aim to overcome hindrances in the development and deployment of these new communication technologies. This collaborative effort holds immense potential to benefit both people and processes, encouraging widespread adoption of such transformative technologies in the future.

- **Food Safety and Standards Authority of India (FSSAI)** has strategically collaborated with the **Bureau of Indian Standards (BIS)** to develop food quality standards.

- **The Petroleum and Natural Gas Regulatory Board (PNGRB)** is engaging with the **Ministry of Housing and Urban Affairs (MoHUA)** to address challenges highlighted by City Gas Distribution (CGD) entities. These challenges include high Right of Use (RoU) and road cutting/restoration charges, as well as delays in obtaining necessary permissions. Additionally, a need is felt to recognise Petroleum and Natural Gas (PNG) as an essential service in town planning, and for this there would be a need for streamlining the permission process and rationalizing charges for infrastructure laying integrating CGD infrastructure into urban development plans is also crucial.

- PNGRB is engaging with the **Ministry of Road Transport and Highways (MoRT&H)** and the **National Highways Authority of India (NHAI)**, to integrate CGD and pipeline infrastructure with highway projects during construction, minimizing disruptions and ensuring optimal land use.

- To promote the adoption of PNG and CNG in defence establishments and vehicles, thereby reducing carbon emissions and enhancing energy efficiency, PNGRB has engaged with the **Ministry of Defence** to address budget allocation issues and promote the adoption of PNG and CNG.

- PNGRB is engaging with the **Ministry of Petroleum and Natural Gas (MoPNG)** to address high RoU, road cutting/restoration charges, and delays in obtaining permissions, which are significant roadblocks for CGD infrastructure development. They have also sought subsidies for PNG and promotion of natural gas usage to encourage adoption across the country.

- With the **Ministry of Home Affairs (MHA)**, PNGRB has engaged in rationalization of high road repair charges and Value Added Tax (VAT) rates, as well as timely permissions for infrastructure projects in Union Territories, as these issues are causing hindrances to the viability of natural gas projects.

- PNGRB has engaged with the **Ministry of Environment, Forest & Climate Change** to address delays in obtaining forest clearances for critical pipelines, aiming to streamline infrastructure deployment and promote the adoption of cleaner fuels.

- With the **Ministry of Consumer Affairs, Food & Public Distribution**, PNGRB has collaborated to strengthen the consumer protection framework, enhancing consumer confidence and ensuring fair practices.

- Additionally, PNGRB has engaged with the **Ministries of Chemicals & Fertilizers, Power, and Steel** to further promote adoption within those sectors that fall with the purview of respective ministries.

- **National Highways Logistics Management Limited (NHLML)** - a wholly owned subsidiary of NHAI plans to develop 20,000 km of **Optical Fiber Cable (OFC)** Network along national highways under guidance from the Telecom Regulatory Authority of India (TRAI). Under the project, NHLML will develop OFC support infrastructure (utility corridors for OFC ducts, manholes and handholes for direct access to ducts, network operation centres for supervision, monitoring and control of the installed and leased OFC network, etc). For this, multiple consultations have been already held between NHLML, Department of Telecommunications (DoT) and TRAI to finalize the allotment mechanism for the OFC infrastructure. A three-member committee representing TRAI, DoT and the Ministry of Road Transport and Highways (MoRTH) was formed to review policy, viability of the project and way forward. As a result of the collaboration, on-ground works for two pilot projects namely Delhi-Mumbai Expressway (DME) and Hyderabad-Bangalore National Corridor, have already started. In February 2024, NHAI/NHLML and TRAI conducted a drive test along with all the telecom operators in the Delhi to Dausa section of DME to check network connectivity.

Potential areas of Future Collaboration

4.4 The Inter-Regulator Working Group, through its extensive and detailed discussions, has identified areas for future collaboration among regulators on various cross-sectoral issues. Some of the potential areas identified include:

AERA with other Regulators

4.4.1 **AERA with CERC:** - AERA seeks collaboration and knowledge sharing with the Central Electricity Regulatory Commission (CERC) regarding the formalization of performance standards related to the quality, continuity, and reliability of services at airports, as well as the monitoring of these performance standards, their

implementation, and any associated penalty provisions. Additionally, AERA aims to work with CERC on setting up Operation and Maintenance (O&M) Normative Cost Guidelines with no true-up mechanism for the aviation sector.

4.4.2 **AERA and the Electricity Regulators on Net Metering for Green Energy:-** The collaboration between the Airports Economic Regulatory Authority of India (AERA) and the Electricity Sector regulators can expedite the adoption of greener technologies at airports, focusing on net metering for green energy. Key benefits of this collaboration include:

- Renewable Energy Generation: Airports can generate renewable energy (e.g., solar, wind) and feed surplus electricity back into the grid, promoting clean energy use and reducing carbon emissions

- Cost Reduction: Generating their own electricity allows airports to potentially reduce electricity bills and operating costs.

- Facilitating Implementation: Collaboration can smooth the implementation of net metering schemes at airports, using surplus land for solar energy generation.

- Overcoming Legislative Limits: Current state legislation limits net metering, causing surplus green electricity to go uncompensated, impeding the goal of carbon-neutral airports. Coordinated efforts between sectoral regulators, airport operators, and state electricity companies are needed to address these limitations and ensure full compensation for surplus green electricity fed back into the grid.

4.4.3 **AERA and the PNGRB on ATF Pipeline Development:** The Petroleum and Natural Gas Regulatory Board (PNGRB) and Airport Sector Regulators can work together to develop a policy framework for an Aviation Turbine Fuel (ATF) pipeline network connecting major airports. Key areas include:

- Policy Framework Development: Collaboration on policy framework considering existing regulatory frameworks of AERA.
- Pipeline Connection: While ATF is currently delivered by tankers, major airports like Delhi and Mumbai are connected to ATF pipelines. New airports, such as Jewar and Navi Mumbai, will also be connected.
- Benefits: A dedicated ATF pipeline network would reduce transportation costs and ensure a reliable, safe, and continuous supply of ATF, supporting environmental initiatives and reducing carbon emissions associated with conventional ATF transportation.

TAMP with other Regulators:

4.4.4 **TAMP and the Electricity Regulatory Commissions for Green Shipping Initiative:** Major ports are implementing activities to reduce greenhouse gas emissions, with V.O. Chidambaram Port and Paradip Port identified as hydrogen export hubs. The "Harit Sagar" guidelines aim for measurable carbon emission reductions.

Collaboration with the Electricity Regulatory Commissions can enhance energy efficiency, renewable energy integration, and green port initiatives. Ports can also use their land for generating solar and wind energy, making them self-sufficient.

4.4.5 **TAMP and AERA for Digital Transformation:** Major ports are moving towards becoming smart ports, utilizing data-driven technologies, IoT, and automated devices. Collaborations with AERA for R&D and sharing expertise can accelerate this digital transformation.

4.4.6 **TAMP and AERA for Amrit Kaal Vision 2047:** The initiative aims to reduce carbon emissions in the maritime sector by adopting solar and wind energy, providing shore power, using electric port equipment, and transitioning to alternative fuels. Knowledge sharing and best practices with airport authorities can aid this transformation.

4.4.7 **TAMP and PNGRB for Pipeline Expertise:** Major ports handle liquid cargo through pipelines. Collaborating with PNGRB can provide expertise in laying and maintaining pipelines for seamless and safe transportation.

4.4.8 **TAMP and the Electricity Regulators for Berth Emission Reduction:** To reduce emissions while at berth, ships can be supplied with electricity from the national grid instead of using diesel generators. A policy framework involving major ports, the Ministry of Ports, Shipping and Waterways, and the electricity regulatory commissions can support this initiative.

4.4.9 **TAMP and PNGRB Liquefied Natural Gas (LNG) Bunkering:** For LNG bunkering, collaboration with PNGRB can provide technical support and best practices for the transportation of LNG, ensuring a reliable supply and maintaining safety norms.

4.4.10 **TAMP and AERA for Cruise and Ferry Terminals:** To promote ocean, coastal, and river cruise traffic, collaboration with airport authorities can help major ports develop world-class passenger terminal facilities by sharing knowledge and best practices.

4.4.11 **TAMP and AERA for Ease of Doing Business:** Major ports have implemented the Port Community System (PCS) to improve efficiency and reduce costs. Airport authorities can explore adopting similar practices for their cargo terminals.

4.4.12 **TAMP and AERA for Coastal Shipping and Inland Waterways:** To enhance coastal shipping and inland water transport, major ports can collaborate with airport authorities to learn from their experience in developing agglomeration centres and expansion projects.

4.4.13 **TAMP and CCI on Competition Issues:** Under the Major Port Authorities Act 2021, major ports and Build–operate–transfer (BOT) operators can set their tariffs. Collaboration with the Competition Commission of India (CCI) can ensure these tariffs comply with the Competition Act, 2002, and address any regulatory overlaps.

Electricity Regulators with other Regulators

4.4.14 **The Electricity Regulators and TRAI:**

- Utilization of Existing Assets: Telecom companies can use the infrastructure of electricity utilities (poles and towers), reducing capital investment for telecom and generating additional income for utilities through a shared framework.

- Smart Metering Infrastructure: Collaboration between the Electricity Regulatory Commission and TRAI on smart metering can enhance real-time data exchange, supporting advanced metering infrastructure (AMI) and promoting energy efficiency.

- Demand Response Programs: Joint efforts can leverage telecom infrastructure for demand response in electricity, optimizing grid operations and managing peak demand through effective communication networks and protocols.

4.4.15 **The Electricity Regulators and Inland Waterways Authority of India (IWAI) for Floating Solar Power Plants:** Deploying floating solar installations on water bodies managed by IWAI can optimize land use and enhance renewable energy capacity, with guidelines for grid connection and tariff determination provided by the Electricity Regulatory Commission.

4.4.16 **The Electricity Regulators and the Real Estate Regulators for Consumer Issues and Green Energy:** Collaboration between real estate and electricity regulators can address consumer issues in multi-storied buildings and promote green energy initiatives. Policies can facilitate mini-grid promotion and land arrangement for green projects.

4.4.17 **The Electricity Regulators and NHAI for:**

- **EV Charging Infrastructure:** Integration of EV charging stations into highway projects can be facilitated by NHAI providing designated areas and the Electricity Regulatory Commission establishing guidelines for standardization, licensing, and tariffs.

- **Solar Corridors:** Collaboration on solar corridors along highways can expand renewable energy generation by allocating space for solar panels and establishing regulatory frameworks for connecting these installations to the grid.

TRAI with Other Regulators

4.4.18 TRAI seeks collaboration with various authorities to identify and catalogue physical assets suitable for repurposing as telecom infrastructure. Coordination is essential in establishing transparent and expedited processes for authorizing telecom installations. As the Telecommunication Act of 2023, requires streamlined Right of Way (RoW) procedures to expedite telecom infrastructure development, regulatory bodies must ensure compliance with these new regulations within their jurisdictions.

Key aspects include implementing standardized fees and charges across jurisdictions to reduce inconsistencies and enhance predictability for telecom operators, as well as developing effective dispute resolution mechanisms to prevent delays and legal complications related to RoW issues.

NHAI and other Regulators

4.4.19 **NHAI with PNGRB for pipieline infrastructure:** NHAI acquires land for utility corridors along the highways, which is earmarked for laying the pipeline infrastructure for transportation of gas, oil, etc. In this regard, there exists scope for collaboration with the Petroleum and Natural Gas Regulatory Board (PNGRB) for working out the modalities of undertaking pipeline construction at the time of construction of the highway projects. Additionally, a mechanism for issuing faster clearances and permissions to pipeline-laying entities can be worked out together by the respective agencies, which can help avoid duplication of efforts and resource wastage.

4.4.20 **NHAI with TAMP for the Port Connectivity Roads:** The Port Connectivity Roads (PCR) initiative by NHLML offers a potential area of collaboration between executive agencies in both the sectors for laying connectivity roads to the port. NHLML has planned the development of 108 PCR projects for improving road accessibility to the ports. Coordination between port authorities and NHLML can ensure smoother and faster completion of the projects which, in turn, can lead to efficiency gains and reduction in logistics/transportation costs for port users.

4.4.21 **NHAI with TAMP, State Governments and Railways for implementing Multimodal Logistics Park Projects (MMLPs):** MMLPs have been conceptualized to act as freight aggregation and disaggregation centers to enable freight movement on more efficient modes such as higher sized trucks, rail or coastal shipping, thereby improving the efficiency of freight movement and reducing logistics cost. MMLPs shall enable the shift from the point-to-point freight movement to an ideal hub-and-spoke model of freight movement by integrating connectivity through roadways, railways, and waterways/ airways at feasible sites. MMLPs are being developed through Public-Private-Partnership (PPP). Project Specific SPVs are being formed following the principle of PM Gatishakti between Ministry of Road Transport and Highways (through NHLML), Ministry of Railways (through RVNL), Ministry of Ports Shipping and Waterways (wherever applicable through Port Authorities) and State governments (through industrial development corporations of the State Governments and land-owning agencies) to develop MMLPs. Collaboration among NHAI, TAMP, Railways and the State Governments can expedite implementation of MMLPs in an cost effective manner.

4.4.22 **Potential areas of collaboration amongst all FOIR Members**

- **Capacity Building and Training:** To enhance the regulatory teams' capacity and knowledge base of FOIR members, the following initiatives are proposed:
- **Joint Training Programs:** Organizing training programs, workshops, and seminars on regulatory philosophy and frameworks specific to infrastructure and PPP projects.

- **Knowledge Sharing Platforms:** Developing online resources and expert networks to facilitate continuous learning and experience exchange among regulatory teams.

4.5 The collaborative areas identified significantly resonate with sustainable growth initiatives. In this unpredictable world, although each regulator is carefully traversing the path for the nation's development, when they come together amicably to address overlapping issues, their collective efforts shall truly pave the way for 'Vikshit Bharat' by 2047, a vision to which we all aspire and radiate its benefits to the nations beyond.

4.6 The Working Group during its deliberations observed that NHAI is not a member of FOIR at present. NHAI and its subsidiary NHLML are involved in providing OFC support infrastructure, wayside amenities including EV charging infrastructure, acquiring land for utility corridors, building port connectivity road and Multimodal Logistics Parks etc. and thus there are large number of possible areas of collaboration with other sector regulators resulting in benefit for all. The presentation made by NHLML to the Working Group and their input is at Volume of Inputs available at FOIR website for reference. The Working Group is of the view that FOIR Secretariat should request NHAI to become member of FOIR at the earliest.

***

PHOTO GALLERY

Images of discussions of the Working Group

BIBLIOGRAPHY

1. Recommendation of the Council on Regulatory Policy and Governance 2012 OECD
2. Elizabeth Golberg, 'Regulatory Cooperation – A Reality Check' April (2019) M-RCBG Associate Working Paper Series No.115
3. 'Interaction Between Competition Authorities and Sector Regulators – Contribution from India' December 2022, OECD Global Forum on Competition
4. Nilanjan Ghosh, Kushankur Dey, 'Opportunities and Challenges of Regulatory Convergence in India's Financial Sector The Case of the SEBI-FMC Merge' September 5, 2015 vol L no 36
5. Telecom Regulatory Authority of India, Press Release No./2023 'Forum of Indian Regulators (FOIR)- Collaborative Regulatory Mechanism for Socio-economic Development'
6. 'Thematic Report - Convergence: Unlocking Synergies with Other Government Programmes', August 2022, DEMO, Niti Ayog
7. Aditya Bhattacharjee and Oindrila De, 'Anti-cartel Enforcement in India' (2017) 5 Journal of Antitrust Enforcement 166 for a 'structural contradiction' in Indian competition law that hinders anti-cartel enforcement.
8. Lalita Som and Faisal Naru, 'Regulatory Policy in India: Moving towards Regulatory Governance', Vol 8 (2017) OECD Regulatory Policy Working Papers
9. Electricity Act 2003
10. Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations 2024
11. Airports Economic Regulatory Authority of India Act 2008
12. International Civil Aviation Organization Doc 9082
13. International Civil Aviation Organization Doc 9562
14. International Civil Aviation Organization Doc 9980
15. Chicago Convention on International Civil Aviation 1944
16. Terms and Conditions for Determination of Tariff for Airport Operators Guidelines 2011
17. Terms and Conditions for Determination of Tariff for Services Provided for Cargo Facility, Ground Handling, and Supply of Fuel to the Aircraft Guidelines 2011
18. Petroleum and Natural Gas Regulatory Board Act of 2006
19. Petroleum and Natural Gas Regulatory Board (Determination of Natural Gas Pipeline Tariff) Regulations 2008 - consolidated up to April 15, 2024
20. Major Ports Trust Act 1963
21. Guidelines for Regulation of Tariff at Major Ports 2004
22. Guidelines for upfront tariff setting for PPP projects at Major Port Trusts 2008
23. Revised Guidelines for Determination of Tariff for Projects at Major Ports 2013
24. Tariff Guidelines 2019 for Regulation of Tariff for BOT operators operating in Major Port Trusts under the Tariff Guidelines 2005
25. Constitution of Apex Committee for Implementation of Paris Agreement (AIPA) - 27th November, 2020
26. PIB Release: Launch of PM Gati Shakti–National Master Plan for Multi-modal Connvectivity - 13th October 2021
27. Artificial Intelligence Committees Reports, Ministry of Electronics and Information Technology

ABOUT FOIR

The Forum of Indian Regulators was formally registered as a Society under the Societies Registration Act, with the Registrar of Societies in the National Capital Territory of Delhi on February 4, 2000. Schedule-I provides the Memorandum of Association, while Schedule-II provides the Rules and Regulations.

The Orissa Electricity Regulatory Commission (OERC) was the first Regulatory Commission constituted in the electric power sector on November 28, 1996. This was followed by the Central Electricity Regulatory Commission (CERC) which was constituted in August 1998 and the Haryana Electricity Regulatory Commission (HERC) on March 10, 1998. Ten more followed to it thereafter. A need was felt by these regulators for a common platform to discuss emerging issues in regulatory procedures and practices, to evolve common strategies to meet the challenges before regulators in India and to share information and experiences. A meeting was convened of the CERC, OERC and HERC in February, 1999 at New Delhi to discuss the modalities for constituting a suitable forum. The idea quickly found acceptance and as more Regulatory Commissions were constituted, either under State specific Acts, or the Electricity Regulatory Commissions Act, 1998, they started participating in the activities of the Forum of Indian Regulators. The constitution of the Forum does not restrict it only to the electricity sector. At present, FOIR membership consists of 38 regulatory bodies.

MISSION STATEMENT

- Promote transparency in the working of the regulatory bodies;
- Protect consumer interest and develop consumer advocacy organizations;
- Develop human and institutional capacities in regulatory bodies, utilities, and other stakeholders;
- Research the efficiency and effectiveness of independent regulation and matters incidental thereto;
- Provide an information base on regulatory law and practice and regulatory economics;
- Collaborate with academic and research institutions, professional bodies, and NGOs in India and internationally in areas of interest to the society;
- Do all such other lawful things as are conducive or incidental to the attainment of the above aims and objectives.

ADDRESS
FOIR Secretariat
C/O Central Electricity Regulatory Commission,
8th Floor, Tower B, World Trade Centre
Nauroji Nagar, New Delhi-110029
Email: asecy.foir@gmail.com
Website: foir-india.org

Forum of Indian Regulators (FOIR)
8th Floor, Tower B, World Trade Centre
Nauroji Nagar, New Delhi-110029
Website: foir-india.org