Use Case: Regulatory Assistant

1. Goal

To develop an AI-powered Regulatory Assistant that helps Discoms and Regulators prepare, analyse, and interpret tariff petitions and regulatory orders efficiently using an open-source, jointly owned pre-trained model built on Indian electricity sector regulations and judicial decisions.

2. Problem Context

Electricity regulatory filings and orders run into thousands of pages, full of financial data, legal references, and performance parameters.

- Discoms spend months preparing ARR (Annual Revenue Requirement) and True-Up Petitions, often repeating manual work.
- Regulators (SERCs/CERC) must review multiple years' petitions, past orders, and policy directives to draft new tariff orders. This is a complex and time-consuming process.
- Valuable insights remain buried in unstructured text and tables spread across hundreds of regulatory documents.

This creates inefficiency, inconsistency, and delays in decision-making.

3. Solution Concept

Build an Open-Source Large Language Model (LLM)-based Regulatory Assistant that acts as a virtual co-pilot for both Discoms and Regulators, helping them navigate the complex regulatory and financial landscape of the electricity sector.

3.1. Assist Discoms

Help Discoms prepare Annual Revenue Requirement (ARR) and True-Up Petitions accurately and efficiently by automating data collection, validation, and drafting.

Example 1: "*Prepare a draft tariff petition for 2027-28 to be filed before SERC.*"

Auto-populate petition formats by extracting past approved figures (e.g., power purchase cost, employee cost, O&M expenses) from previous tariff orders.

Example 2: Suggest justifications for cost variations using regulatory language based on previous accepted reasons by the same or other SERCs.

For instance: "Employee cost increased by 8% in FY24 due to 7th Pay Commission arrears. A similar allowance was approved by UPERC (Order No. 123/2022, Pg. 67)."

Example 3: Cross-verify data consistency between audited financials, petitions, and MYT formats.

Example 4: Generate auto-checklists highlighting missing annexures, incomplete forms, or deviation from tariff regulations.

Example 5: "*Draft the summary of justifications and responses to objections raised during public hearings.*"

3.2.   Assist Regulators

Enable Electricity Regulatory Commissions (SERCs/CERC) to prepare Draft Tariff Orders, True-Up Orders, and Consultative Papers with greater speed, precision, and transparency.

Example 1: Auto-summarize Discom filings and highlight key deviations from previous years or approved norms.

Say: *Power purchase cost has increased by 12% over approved value due to short-term procurement; check justification under Regulation 34(1).*

Example 2: *Generate section-wise draft order text using standard regulatory phrasing drawn from past orders*.

S a y : *Automatically draft paragraphs under sections like Sales Forecast, AT&C Loss Trajectory, Power Purchase Cost, Revenue Gap, etc.*

Example 3: Compare similar cases across states or years to promote consistency.

Say: *Compare how Delhi and Gujarat SERCs treated wheeling charges for open access consumers in FY23.*

Example 4: Provide instant answers to legal and regulatory queries with page-level citations from CERC, APTEL, or Supreme Court orders.

Say: *Show APTEL rulings where truing-up of uncontrollable costs was allowed post MYT period."*

Example 5: Automatically flag compliance gaps with MYT Regulations or National Tariff Policy provisions.

3.3. Cross-Functional Capability

In addition, the Regulatory Assistant should:

- Create side-by-side comparisons of ARR assumptions across years or across states.
- Provide summary dashboards for quick regulatory review of multiple Discoms.
- Serve as a training and reference tool for new officers in SERCs and utilities.
- Answer natural-language queries about any regulatory issue with precise, page-level citations from SERC/CERC/APTEL/High Court/Supreme Court orders.
  - Example: *"What was the approved power purchase cost for FY22 in Maharashtra?"*
  - Example: *"Compare the treatment of loss trajectory between Gujarat and Tamil Nadu."*

4. Key Features

- Pre-trained Model: Built on an open-source base model (e.g., LLaMA/Mistral) and fine-tuned on all regulatory orders and judgments from SERCs, CERC, APTEL, and relevant High Court and Supreme Court rulings.
- Joint Ownership: The model weights will be jointly owned by an entity of the Ministry of Power (MoP) and the private developer, ensuring public accountability and national capacity-building.
- Citation Engine: Every AI-generated summary or answer includes exact source references (document name, order number, page).
- Comparison Tool: Enables cross-order comparison (e.g., power purchase cost, AT&C loss, tariff recovery trends).
- Auto-Drafting: Suggests section-wise text for draft tariff or true-up orders.
- Smart Dashboard: Visualizes trends in ARR, subsidy, or loss trajectories across years and states.

5. Tech Stack

- LLM Base: Open-source models (e.g., Mistral, LLaMA, Falcon)

fine-tuned with Retrieval-Augmented Generation (RAG).
- Document Store: Vector database for efficient semantic search (FAISS/Pinecone).
- OCR & Parsing: To handle PDFs, scanned orders, and tabular data.
- Interface: Easy to use web-based dashboard with search, drafting, and comparison modes.

6. Expected Outcomes

- Faster preparation: Up to 70% reduction in time for petition and order drafting.
- Transparency: All AI outputs are source-cited and verifiable.
- Consistency: Uniform referencing of past orders and judicial precedents.
- Public Value: Open-source foundation ensures continuous sector-wide use and innovation.

7. Evaluation Criteria

- Accuracy and reliability of summaries and citations.
- Clarity and usability of the interface for non-technical users.
- Quality and explainability of AI outputs.
- Compliance with open-source licensing and joint ownership framework.

8. Illustrative Output Example

Query: "Summarize reasons for disallowance of power purchase cost in Tamil Nadu FY22 order."
AI Response:

"₹423 Cr disallowed due to deviation from merit order dispatch (Page 47, TNERC Order No. 2022/04).
Reason: Higher cost arising from non-scheduling of cheaper available stations."

9. Strategic Impact

This initiative aligns with the objectives of:

- Viksit Bharat @2047: enabling efficient, transparent governance.
- Digital India Mission: open, accessible, AI-driven public sector solutions.
- Power Sector Reforms: enhancing regulatory capacity and reducing delays.