Renewable Consumption Obligation: Design, Compliance, Penalties, and State Implementation

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Session 5: Renewable Consumption Obligation for DISCOMs

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What is RCO Framework?

- Shifts compliance from “procurement” to “consumption”
  - Aligning with demand-side accountability for national non-fossil targets)
- Creates a common compliance language across stakeholders
  - Discoms, Open Access (OA) consumers, and Captive users (CPPs) etc.
- Leads to reasonable central level monitoring
  - Provides clarity on behind-the-meter and distributed RE
- Introduces buyout mechanism + REC-based options to manage shortfalls
  - Else, penalties

RCO vs. erstwhile RPO

- All entities have ~the same obligations (no state-wise heterogeneity)
- RCO is notified under the Energy Conservation Act (designated consumers; BEE monitoring; EC Act penalties)
- RPO is enforced via SERC regulations under the Electricity Act (obligated entities; state agencies; EA penalties)
- In practice, the same physical actions (RE procurement / RECs) are used for both — but definitions, MRV, and penalties differ

Compliance Pathways

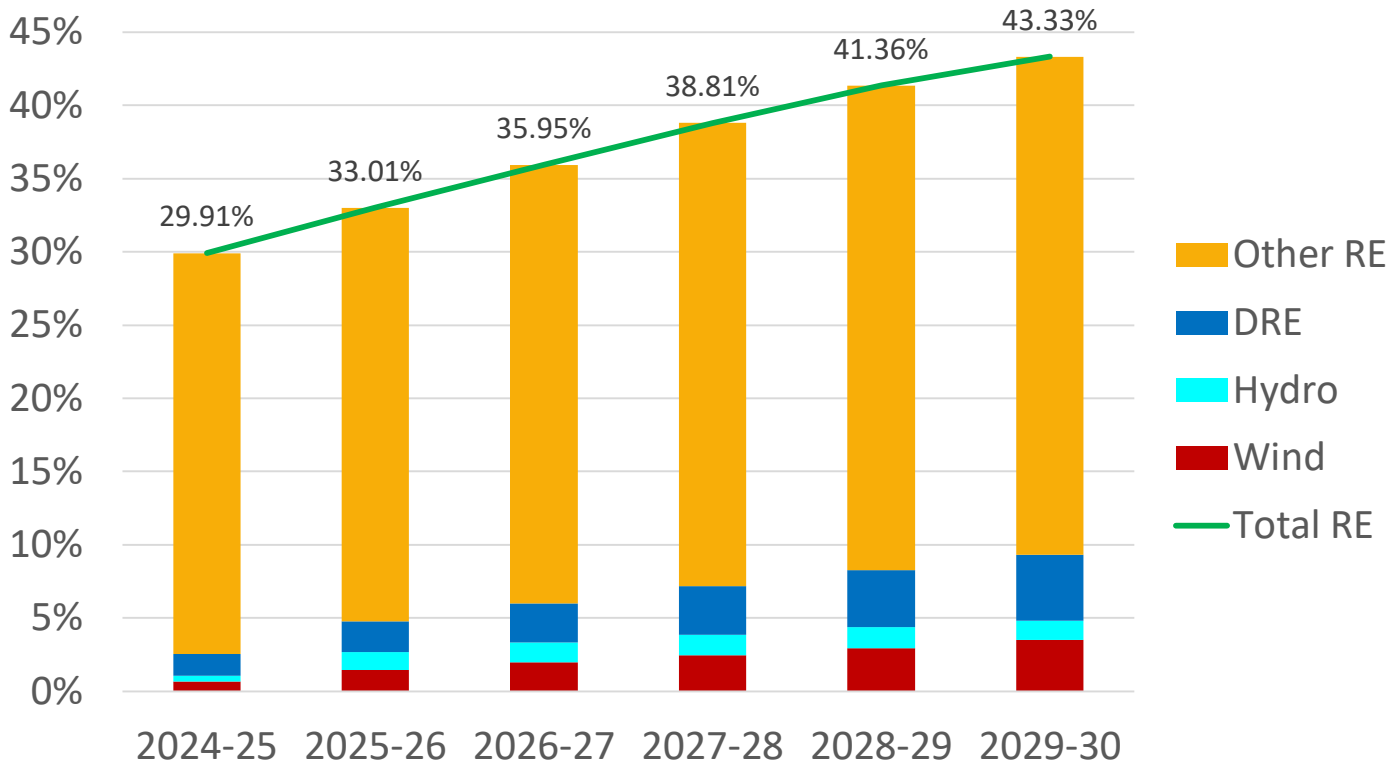
- Direct consumption, REC, Buyout mechanism
- VPPAs also allow consumers to contract for green attributes without physical delivery constraints.
- VPPAs can potentially reduce reliance on short-term REC markets and improve additionality

Core definitions that drive compliance (what counts as 'consumption'?)

- Obligation is expressed as % of 'Adjusted Total Consumption' (definition matters more than the %)
- Typical exclusions/adjustments include hydro purchases and nuclear purchases (as defined in notification annexures)
- Behind-the-meter RE (rooftop solar): MRV must capture *gross generation* to avoid systematic bias
- Netting, banking, and storage raise traceability questions: what counts as RE consumed vs shifted vs exported?

Trajectory of Obligation (FY 2024–25 to FY 2029–30)

Illustrative trajectory (wind + hydro + other/distributed/RE)



Source: MoP October 20, 2023 notification

2024-25 RE:

With total consumption est. 1,694 BU (including captive), only 15.07% RE share, excl. large hydro of 8.80% = >6% shortfall in total

[per CEA monthly exec. summary data (ignoring aux. losses – only generation)]

Note: RCO calls for "new supply" post March 2024 for wind/hydro but has fungibility in many sources (but not DRE)

Statewise Penalties are set by SERCs

- Can be substantial, especially for some states (all have equal targets, but RE has historically varied – that is not entirely their fault – earlier targets were also heterogeneous)
- Discoms are the majority of RCOs
- Say there is a 10% shortfall for a state = how large a penalty (potentially thousands of crores for large states??)

- BUT backstop to avoid penalties = Buyouts, to be determined by CERC (e.g., linked to REC prices)
  - Too low = not enough incentive
  - Too high = potential huge cost

What is the RE Capacity Requirement?

- **Outcomes hinge on assumed CUF:** "Contribution" is largely a function of the CUF used in accounting
- **Real value is system-dependent:** Storage, transmission availability, and curtailment determine usable supply

RPOs as per FY	New Wind	New Hydro	DRE	Other RE	Total RE
2029–2030	3.48 %	1.33 %	4.50 %	34.02 %	43.33 %

Year	Total Demand (BU)	Old Wind (GW)	New Wind (GW)	Old Solar (GW)	New Solar (GW)	All DREs (GW)	RPO Target Solar:Wind Ratio	Total Non-Fossil (GW)
2029-30	2,332.8	45.89	25.74	69.05	206.28	74.90	4.89	496

Additional Solar and Wind Required to Meet RPOs from FY 2024–2025 to FY 2029–2030

Source: Vijay & Tongia (2025)

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Challenges

- Penalties (or buyouts) may not be high enough (?)
  - Non-Compliance penalties should be uniformly administered by ERCs
  - Penalties should not be a “pass-through”
- **RCOs ignore any ToD**
- RE generation ≠ consumption
  - VRE will increasingly be curtailed
  - Long distance RE will have high transmission losses
- Is only a supply side mechanism – no coverage of demand avoidance/DR/flexibility etc.

Challenges – Data and MRV

- BTM is a special challenge
  - Rooftop solar reduces net grid draw; if only net draw is measured, obligations can be mis-estimated
  - Measure of monthly gross generation (at inverter / bi-directional meter)
  - Need gross metering data
- “Carry-forward” of compliance can reduce volatility, but must be bounded (e.g., multi-year true-up checkpoints)
  - Calls for periodic reconciliation (compliance dashboard, audited year-end reconciliation etc.)
- Fallback multipliers (fixed kWh/kW/day assumptions) can distort obligations across regions and seasons

Thank You