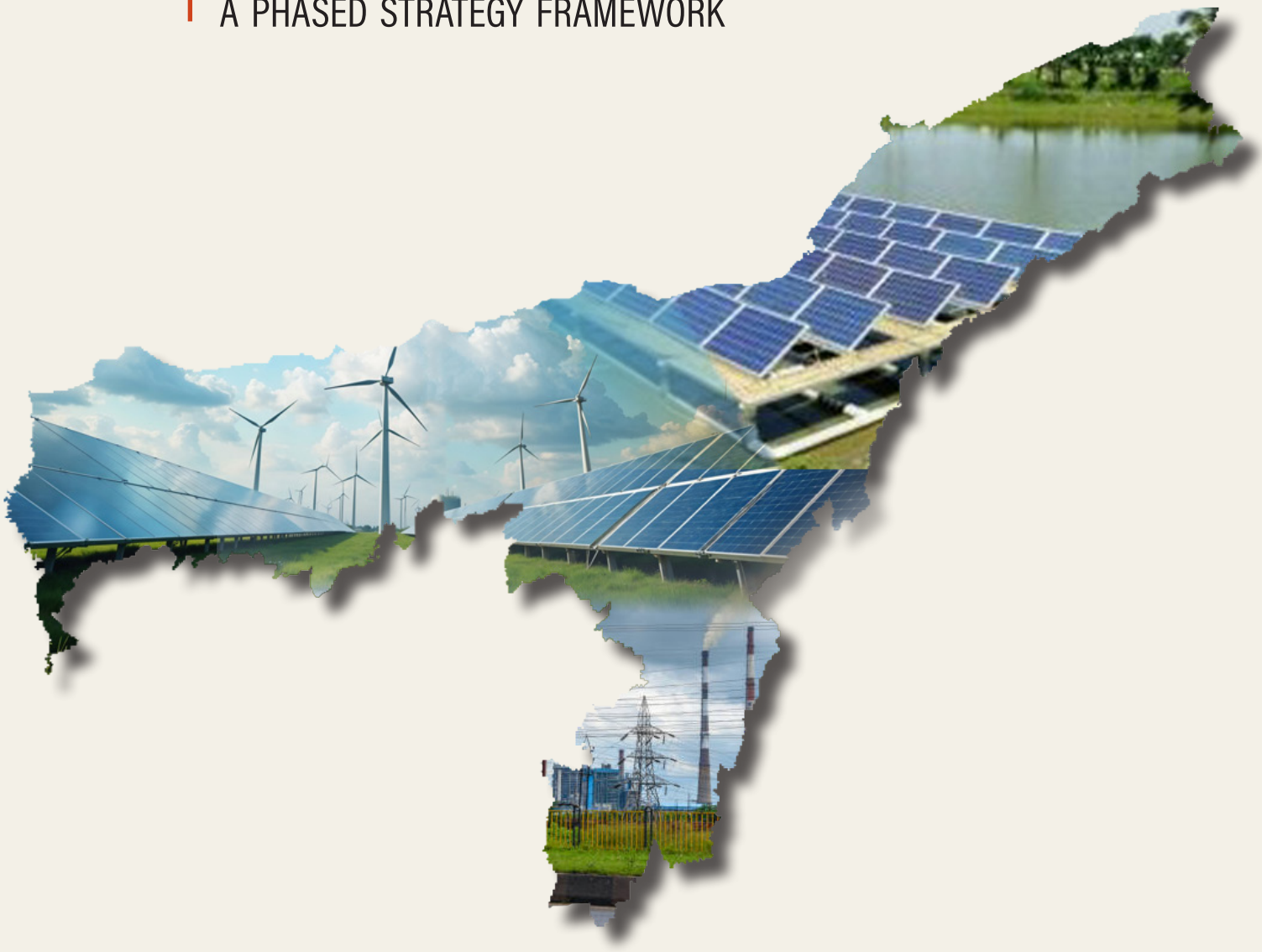
iFOREST
INTERNATIONAL
FORUM
FOR ENVIRONMENT,
SUSTAINABILITY
& TECHNOLOGY

ROAD TO SCALED **RENEWABLE ENERGY DEPLOYMENT IN ASSAM**

A PHASED STRATEGY FRAMEWORK



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Disclaimer:

The views expressed in this report are based on stakeholder consultations and independent analysis. They do not necessarily reflect the official positions of the Government of Assam or any of the participating institutions.

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Contents

List of Figures iv
List of Tables iv
List of Abbreviations v

Section 1

The Case for Action: Assam's Power sector at crossroads 1

Power demand & supply scenario 2
Plans for the future: A decade ahead 4
RCO challenge & opportunity 5
On-ground commitment: Targets & progress 7
Projects under development 8

Section 2

A Thematic Review of Assam's Energy Transition: A four-pronged strategy framework 11

Key sectoral strategies 12
Strategy 1: Manage the thermal bridge- Ensuring baseload reliability 12
Strategy 2: Accelerate solar deployment- scaling RTS, revitalising utility parks, & unlocking FSPV 15
Strategy 3: Building the storage backbone with PSP 19
Strategy 4: Modernising the grid- Anchored by central schemes 22
What is still missing: Gaps in Assam's RE Agenda 25

Section 3

Priority Actions: Way Forward

Priority action matrix 31

References 34
Annexures 35

List of Figures

Section 1

Figure 1: Annual peak deficit and energy demand from 2015-2025 3
Figure 2: Installed capacity mix 3
Figure 3: Bifurcation of power procurement cost in 2024-25 3
Figure 4: Trend of APPC and ACOS energy prices 4
Figure 5: Projected peak and energy demand till 2035-36 4
Figure 6: Projected contracted capacity till 2035-36 5
Figure 7: Installed capacity required to meet RCO by 2029-30 6
Figure 8: Large scale power plants present in Assam 9

Section 2

Figure 9: Distributed solar installed capacity growth 2014-2026 17
Figure 10: All India status under PM-SGMBY RTS installations 18
Figure 11: Li-ion battery price projection till 2035 20
Figure 12: Financial expense breakup of APDCL for FY 2025-26 22
Figure 13: Financial projection of APDCL till 2029-30 23
Figure 14: APDCL investment projected between 2025-26 and 2029-30 24

List of Tables

Table 1: RPO met by APDCL as of 2024-25 5
Table 2: Profile of captive consumers in Assam 6
Table 3: Policy and regulatory focus and progress 7
Table 4: Installed TPP capacity and generation 2025-26 13
Table 5: Major TPP addition till 2035-36 13
Table 6: Comparison parameters between PSP & BESS 19

List of Abbreviations

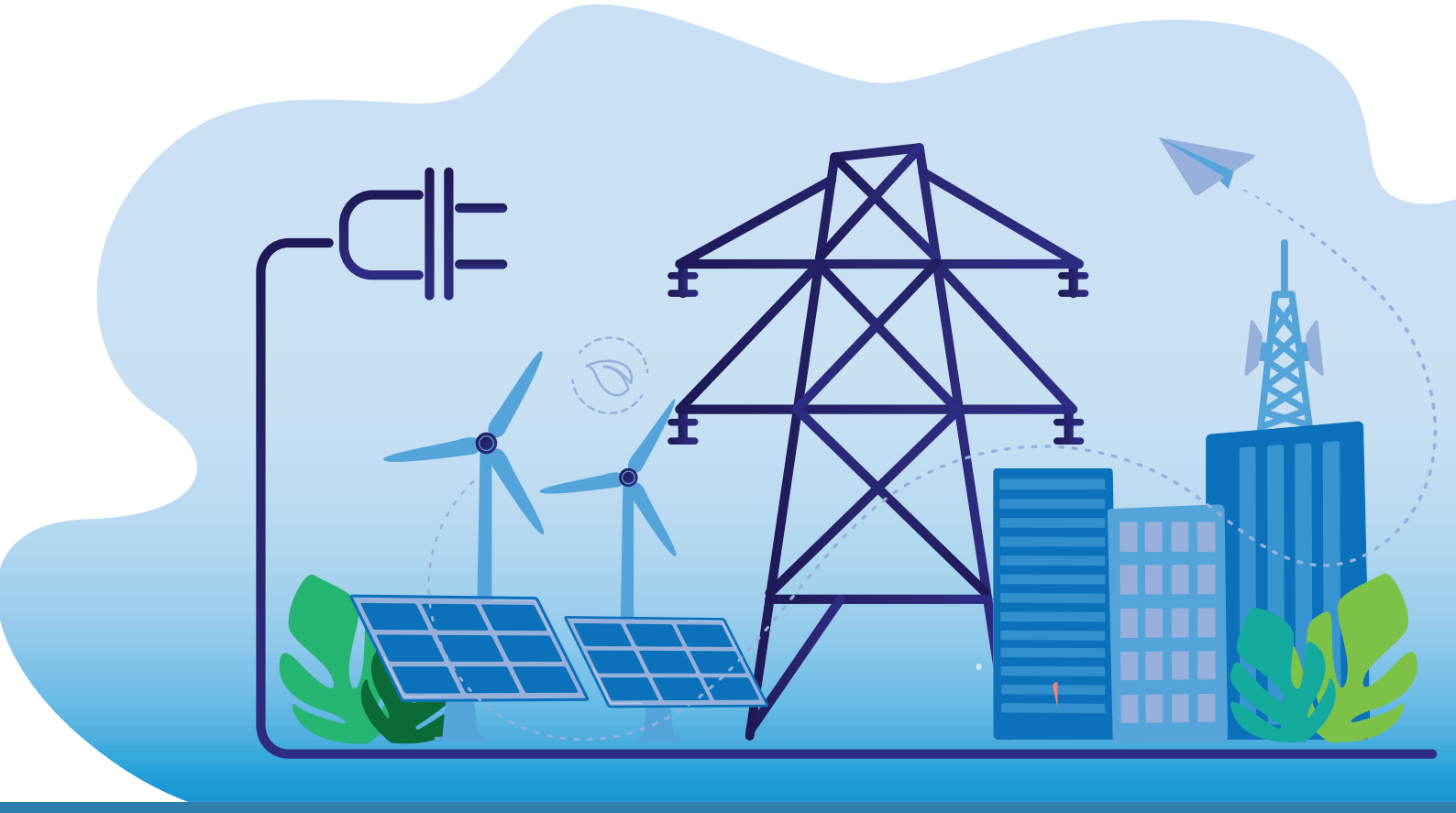
ACOS	Average Cost of Supply
AEDA	Assam Energy Designated Agency
AEGCL	Assam Electricity Grid Corporation Limited
AERC	Assam Electricity Regulatory Commission
APDCL	Assam Power Distribution Corporation Limited
APGCL	Assam Power Generation Corporation Limited
APPC	Average Power Procurement Cost
ARR	Aggregate Revenue Requirement
AREP	Assam Renewable Energy Policy
AT&C	Aggregate Technical & Commercial
BESS	Battery Energy Storage Systems
BVFCL	Brahmaputra Valley Fertiliser Corporation Limited
C&I	Commercial & Industrial
CAGR	Compound Annual Growth Rate
CAPEX	Capital Expenditure
CEA	Central Electricity Authority
ESCO	Energy Service Company
FSPV	Floating Solar Photo Voltaic
GNM	Group Net Metering
HT-LT	High Tension – Low Tension
ICEP	Integrated Clean Energy Policy
ISTS	Inter-State Transmission System
LCOE	Levelised Cost of Energy
MSME	Micro, Small and Medium Industries
MU	Million Units
O&M	Operation & Maintenance
OPEX	Operational Expenditure
PM-SGMBY	Prime Minister Surya Ghar Muft Bijli Yojana
PSP	Pumped Storage Plants
PPA	Power Purchase Agreement

PSGPP	Pumped Storage Generation Promotion Policy
RCO	Renewable Compliance Obligation
RDSS	Revamped Distribution Sector Scheme
RE	Renewable Energy
RESCO	Renewable Energy Service Company
RPO	Renewable Purchase Obligation
RTS	Rooftop Solar
SMR	Small Module Reactor
SPGPP	Solar Power Generation Promotion Policy
T&D	Transmission & Distribution
TBCB	Tariff Based Competitive Bidding
TPP	Thermal Power Plant
TPGPP	Thermal Power Generation Promotion Policy
VNM	Virtual Net Metering

Section 1

The Case for Action

Assam's Power Sector at Crossroads



Power demand & supply scenario

The peak demand in Assam has grown at a CAGR of 6.6% over the past decade, rising from 1,491 MW in 2015 to 2,812 MW in 2025. Total annual energy demand has climbed from 7,926 MU to 12,837 MU over the same period at a CAGR of 5.0%.

The peak deficit, which stood at a critical 17.3% in 2020, has been compressed to approximately 1.5% by 2025, which is an important improvement. Still, one that masks growing system stress concentrated in the summer months (May - September).

The summer heatmap (Annexure 1) signals the extension of peak demand across the precepted seasonal load rather than isolated spikes, shifting the system challenge from energy adequacy to peak-time flexibility. Gas and imported coal-based thermal power are currently carrying this demand burden.

2,812 MW Peak demand (2025)	**12,837 MU** Annual Energy demand (2025)	**6.6 %** Peak demand CAGR (2015-2025)	**1.5%** Peak deficit (2025)

The present installed capacity mix indicates a structural dependence on fossil fuels (50%) and imports. Renewables show meaningful progress in aggregate (25%), but have achieved only a fraction, i.e. 612 MW of their potential (42 GW).

On quality of supply, AT&C losses of 15.4% (2024-25) and a low HT/LT ratio of 0.34 reflect an LT-heavy network prone to voltage drops, high technical losses, and summer load shedding; the very conditions that undermine consumer confidence in the adoption of rooftop solar, which fails to operate during grid outages.

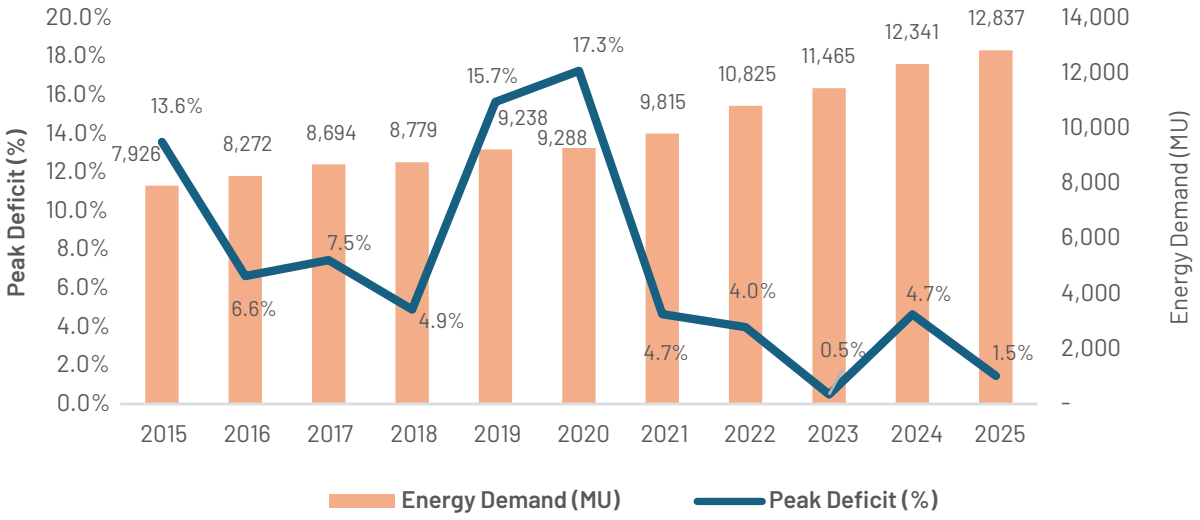
Out of Rs. 9,320 Crore spent on power procurement in 2024-25, the state spends 53% of the cost in power purchase from sources outside Assam, which includes RE and non-RE sources. This also includes the transmission charges to the PGCIL for interstate energy trading usage.

The average cost of supply (ACOS) stands at ₹8.72/kWh, while the average power procurement cost (APPC) is ₹5.80/kWh (AERC, 2025). Local RE is already demonstrably cheaper: Amguri Solar Park supplies at ₹3.98/kWh; Azure Power SPV at ₹3.34/kWh; SECI Wind at ₹2.73/kWh- against a pooled procurement cost of ₹5.80/kWh and imported RE costs that carry an additional ₹0.61/kWh in ISTS transmission charges, as per iFOREST's assessment. The economic logic for domestic RE is already compelling, and will sharpen further as ISTS waivers phase out.

₹8.72/kWh ACOS (2025)	**₹5.93/kWh** APPC (2025)	**₹5.9 – 6.1/kWh** Local thermal/gas APPC (2025)	**₹3.3 – 3.9/kWh** Local solar APPC (2025)

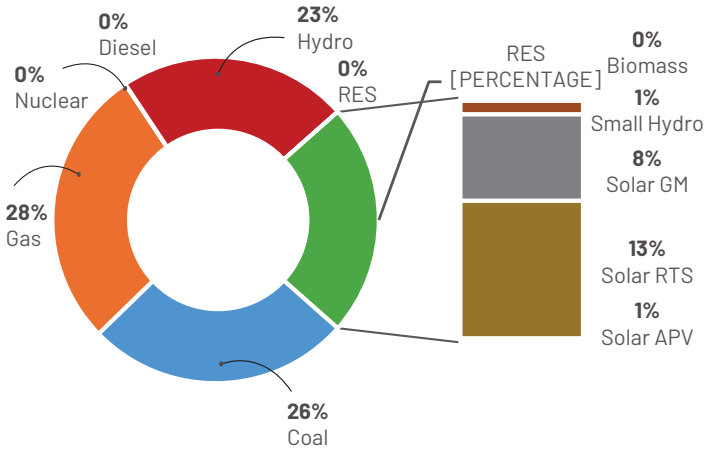
Assam's power sector is experiencing a structural transition. Demand is rising quickly since the easing of lockdown measures post-pandemic; the state's reliance on imported power exposes consumers to high energy costs, supply risks, and power quality issues.

Figure 1: Annual peak deficit and energy demand from 2015-2025



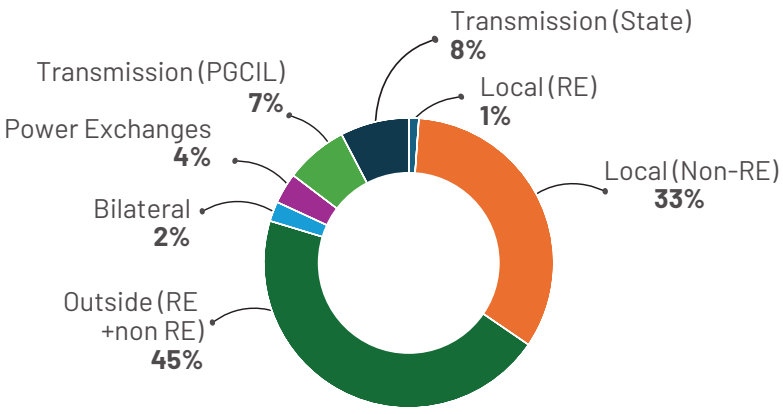
Source: CEA

Figure 2: Installed capacity mix



Source: CEA, March 2026

Figure 3: Bifurcation of power procurement cost in 2024-25



Source: AERC 2025

Plans for the future: A decade ahead

The CEA resource adequacy plan projects Assam's energy demand will grow more than two times from 13,709 MU in 2025-26 to over 31,262 MU by 2035-36, while peak demand is expected to rise from 2.8 GW to more than 5.5 GW.

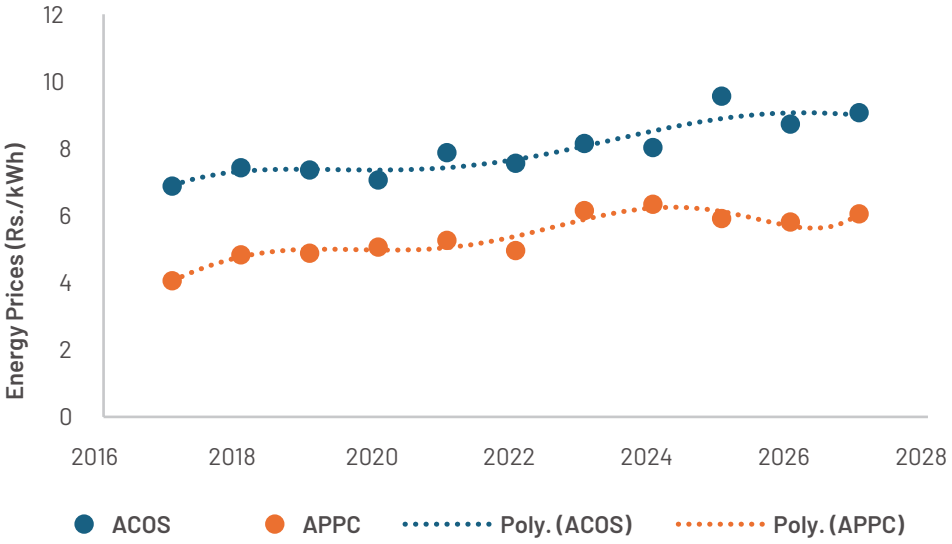
Meeting this would require an expansion of the total contracted capacity to around 18 GW by 2035-36, which is a more than fourfold increase.

The APPC grows by 4% and ACOS by 2.8%, indicating that the procurement prices would increase to over ₹8.1/kWh and supply prices would go over ₹10/kWh.

Locally produced solar energy costs between ₹3.3 – 3.9/kWh for Amguri and Azure Power utility-scale solar plants as per the power procurement costs notified under the AERC tariff order.

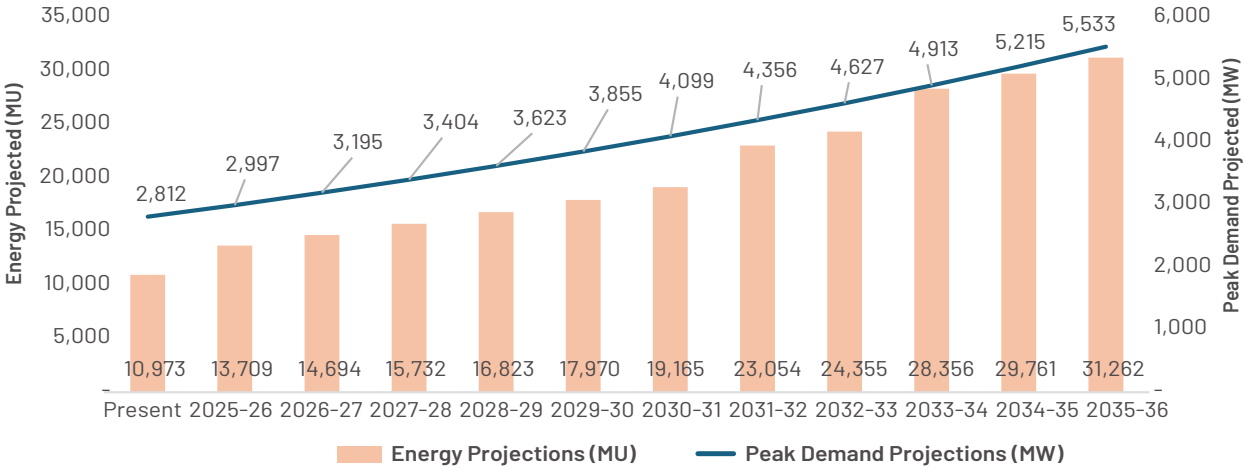
The benchmark cost of a solar power plant is slightly higher than in the western or southern parts of India. However, measures such as policy push and encouraging local manufacturing, the prices can reduce by 10 – 20% (iFOREST assessment).

Figure 4: Trend of APPC and ACOS energy prices



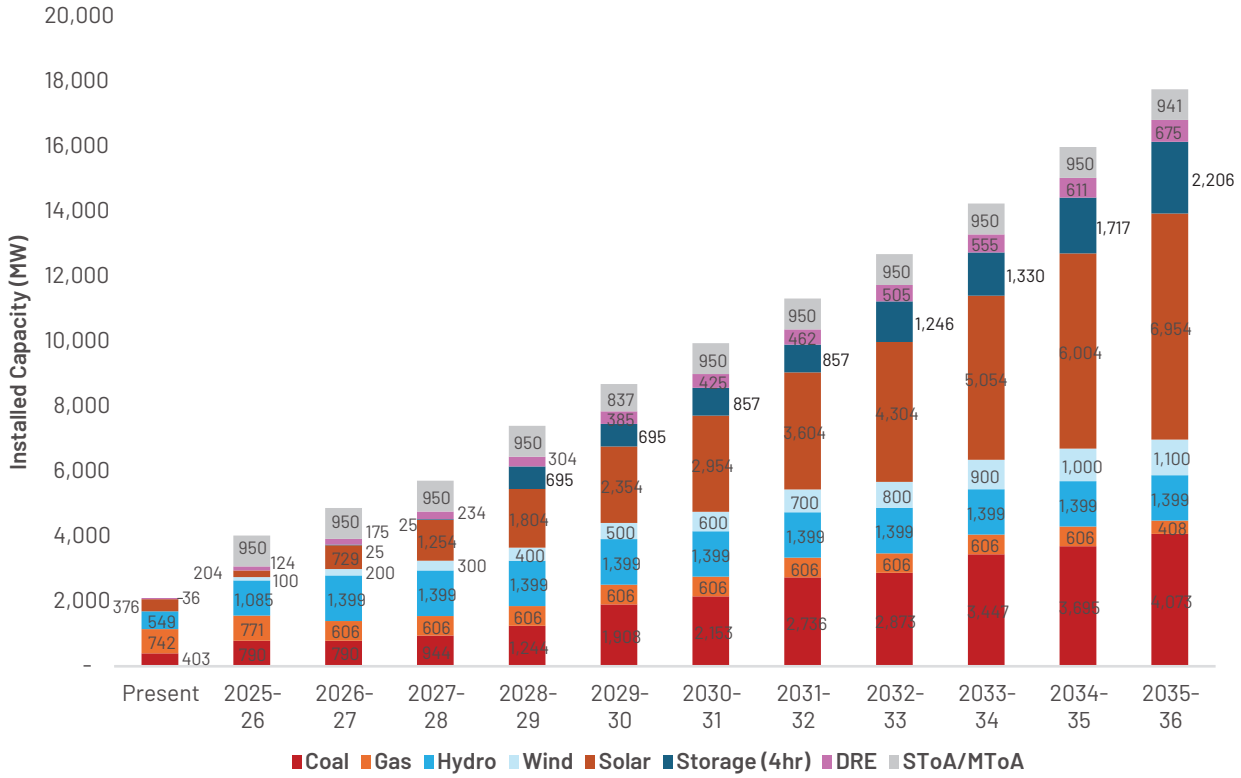
Source: AERC

Figure 5: Projected peak and energy demand till 2035-36



Source: CEA

Figure 6: Projected contracted capacity till 2035-36



Source: CEA

RCO challenge & opportunity

Utility/ gridconnected

RCO requirement for obligated consumers, which includes APDCL, rises from 29.91% in 2024-25 to 43.33% by 2029-30. The Ministry of Power revised the RPO to RCO subsuming the previous guidelines with effect from 2024-25 (BEE).

RPO requirement stood at 12% as of 2020 (AERC), and 22% in 2025, implying a gap of over 21% against the 2029-30 target. Even though the state is ahead in the Hydro obligation, it lags in other sectors, which need a significant scale-up.

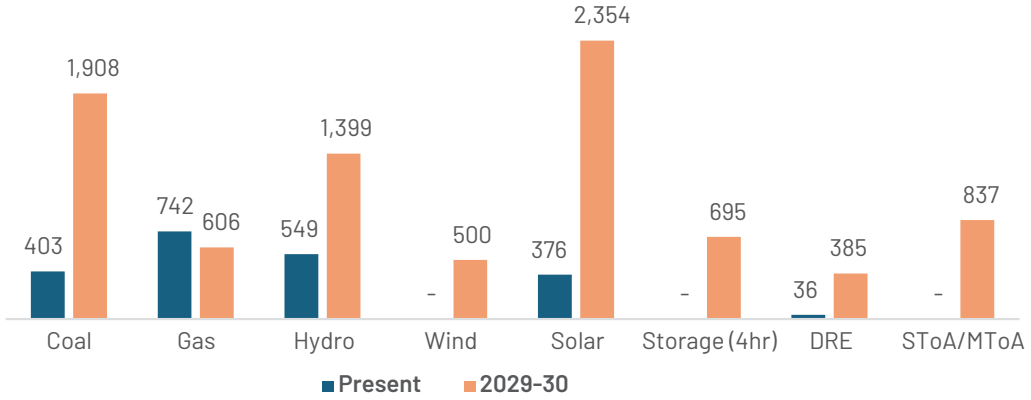
The energy demand for the utility is projected to grow to 17,970 MU by 2029-30 (CEA projection), which includes the T&D losses of 15%. Meeting 43.3% RCO would therefore require 8,948 MU of RE procurement, roughly equivalent to installing 3,500+ MW of new RE capacity. The source-wise bifurcation is provided in Figure 7.

Table 1: RCO met by APDCL as of 2024-25

Year	2024-25	2024-25 (achieved)	2025-26	2026-27	2027-28	2028-29	2029-30
Wind	0.67%	0.67%	1.45%	1.97%	2.45%	2.95%	3.48%
Hydro	0.38%	0.38%	1.22%	1.34%	1.42%	1.42%	1.33%
Distributed	1.50%	0.75%	2.10%	2.70%	3.30%	3.90%	4.50%
Other	27.36%	28.10%	28.24%	29.94%	31.64%	33.09%	34.02%
Total	**29.91%**	**29.90%**	**33.01%**	**35.95%**	**38.81%**	**41.36%**	**43.33%**

**The RPO is calculated based on RE power procured, upon total power procured by the utility*
Source: BEE, APDCL Energy Audit report 2024-25

Figure 7: Installed capacity required to meet RCO by 2029-30



Source: CEA

Non-utility/captive consumers

Captive industrial consumers in Assam continue to play a significant role in the state's power ecosystem, with a total installed captive capacity of 541 MW in 2023, slightly declining to 513.5 MW in 2024.

The captive mix is heavily dominated by gas-based generation (65–70%), followed by steam/thermal (20%), while solar contributes a modest but growing share (7–8%). Diesel-based generation, though declining, still persists as a backup source.

In terms of generation, total captive electricity output reduced from 1,404 GWh in 2023 to 1,301 GWh in 2024, largely due to a drop in steam and diesel generation.

Despite this, industries remain highly dependent on grid imports, with imports (3,018 GWh in 2024) significantly exceeding captive generation.

RPO trajectory shows a steep increase from 27% in 2023–24 to 43% by 2029-30, with rising contributions from wind, hydro, and other renewable sources. For captive industrial consumers, who are also obligated entities; this presents a clear compliance gap.

Table 2: Profile of captive consumers in Assam

	2023		2024	
Number of Industries	**48**		**74**	
Mode	**Installed Capacity (MW)**	**Gross Electricity Generation (GWh)**	**Installed Capacity (MW)**	**Gross Electricity Generation (GWh)**
Hydro	0	0	0	0
Steam	103	310.01	103.31	212.98
Diesel	31	2.91	25.09	1.52
Gas	365	1,055.32	346.34	1,045.08
Solar	42	35.88	38.76	41.62
Wind	0	0	0	0
Biomass	0	0	0	0
Total	**541**	**1,404.12**	**513.5**	**1,301.2**

Consumption profile (GWh)		
	2023	2024
Auxilliary	121.48	119.38
Net generation	1,282.64	1,181.82
Export to utilities	7.76	10.52
Energy used in the industry out of self generation	1,274.88	1,171.3
Import from utilities	2,327.66	301.08
Energy consumed by industries	3,602.54	1,472.38

Source: CEA

Assam faces a distinct RCO gap across both utility and captive segments, requiring rapid scaling of renewables, storage, and procurement mechanisms to meet the 43% target by 2030.

On-ground commitment: Targets & progress

Despite ambitious policy targets, actual deployment reveals an implementation gap between announcement and execution:

Table 3: Policy and regulatory focus and progress

Policy/Scheme/ Regulation	Target / Focus	Key Insight	Progress
PM-KUSUM (2019)	Component A- 2 MW Component B- 4,000 SWP	Solar for agriculture	Component A- 0 MW Component B- 1,441 SWP (till May 2026)
Mukhyamantri Saur Shakti Prokolpo Scheme (2023)*	1,000 MW solar (ground-mounted)	State-led solar expansion	216 MW installed till Feb 2026
PM-SGMBY (2024)	Rooftop solar for 1 crore homes	Nationwide RTS push	Over 1.25 lakh homes, and 400 MW installed as of May 2026
Integrated Clean Energy Policy (2025)*	11.7 GW RE by 2030 (solar, PSP, biomass, BESS, wind, green hydrogen)	Comprehensive RE framework	Currently withdrawn
Solar Power Generation Promotion (2025)	3,500 MW solar by 2030	Scale-up + evacuation focus	Over 400 MW of RTS installed to date 216 MW ground-mounted solar installed 500 MW proposed

Policy/Scheme/ Regulation	Target / Focus	Key Insight	Progress
PSP Generation Promotion (2025)	5,000 MW PSP by 2035	Grid flexibility via storage	5.6 GW pipeline (proposed)
Thermal Generation Promotion (2025)	5,000 MW thermal by 2035	Reliability vs carbon risk	800 MW (under construction) 2.4 GW (proposed)
BESS Guidelines (Draft 2024)	Storage integration	Enables ancillary services	To be finalised
Net Metering (Draft 2024)	Group/virtual net metering	Expands RTS access	To be finalised
Open Access (Draft 2024)	Third-party RE procurement	Boosts C&I participation	To be finalised

** Withdrawn*
Source: Assam State Portal, AERC

Key gaps & concerns

- **Policy certainty and investor confidence:** Frequent transitions from AREP-2022 to ICEP-2025, along with multiple standalone policies (solar, PSP, thermal), create regulatory uncertainty and impacting investor confidence particularly for capital-intensive assets like pumped storage and hybrid RE-storage systems.
- **Execution vs ambition:** While Assam's policy ambition is comparable to leading RE states, institutional and administrative capacity is yet to be scaled leading to slower on-ground implementation.
- **Uneven technology uptake:** Solar (ground-mounted and rooftop) has progressed well, but other technologies like bioenergy, small hydro, agri-PV, floating solar, DRE, and BESS have remained underdeveloped despite available central support.
- **Sector-specific focus:** Policy support is strong for residential rooftop solar, but targeted schemes for MSMEs, C&I consumers, and government infrastructure remain limited.
- **System planning:** Despite separate policies for RE and storage, integrated planning linking generation, storage, demand growth, and grid infrastructure is still evolving.

Projects under development

Assam has a planned installed capacity of 9.3 GW, with a major development in the thermal, solar and PSP sectors.

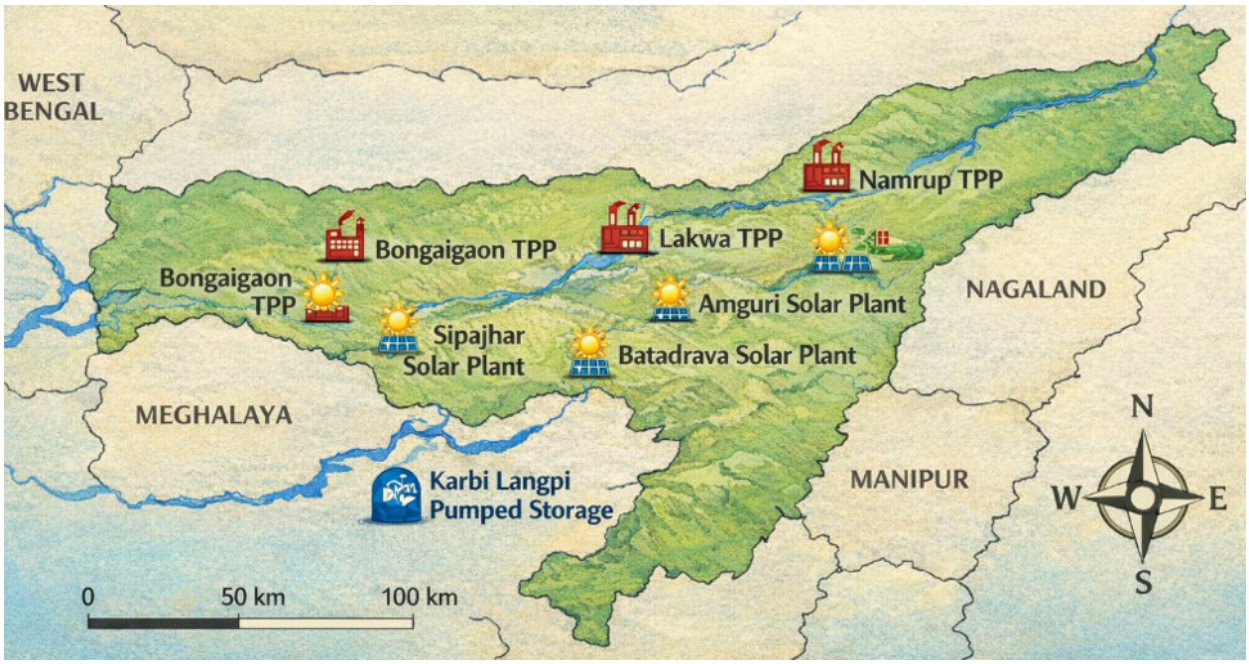
- **Thermal Power Plant (TPP)** 4×800 MW TPP in Dhubri by Adani Group, to be, operational by 2032; largest in the region. It is also planned to be constructed in the Dhubri district, Barak Valley region of Assam, which is strategically placed near the seven sister states.
- **Pumped Storage Hydro:** There are 5.6 GW of projects under pipeline-

- **Adani Group- 2 unjts-** 1,500 MW and 1,200 MW
- **Hinduja Group-** 2 units of 1,000 MW each
- **Greenko Group-** 900 MW

- **Utility Solar**: 500 MW utility-scale solar is proposed to be developed by APGCL in parts, as mentioned in the CEA resource adequacy plan 2035-36.



Figure 8: Large scale power plants present in Assam



Source: CEA, APDCL

Alignment with resource adequacy plan

- **Adequacy mix:** Solar (39%), storage-4hr (13%), coal 23%), hydro (8%), Wind (6%), Gas (2%), DRE+SToA+MToA (9%) by 2035–36.
- **Thermal overbuild risk:** 3.2 GW pipeline exceeds adequacy needs.
- **PSP aligned but delayed:** 5.6 GW in pipeline. However, Execution and contracting remain delayed
- **Solar priority** 0.5 GW added so far, more scaling up required

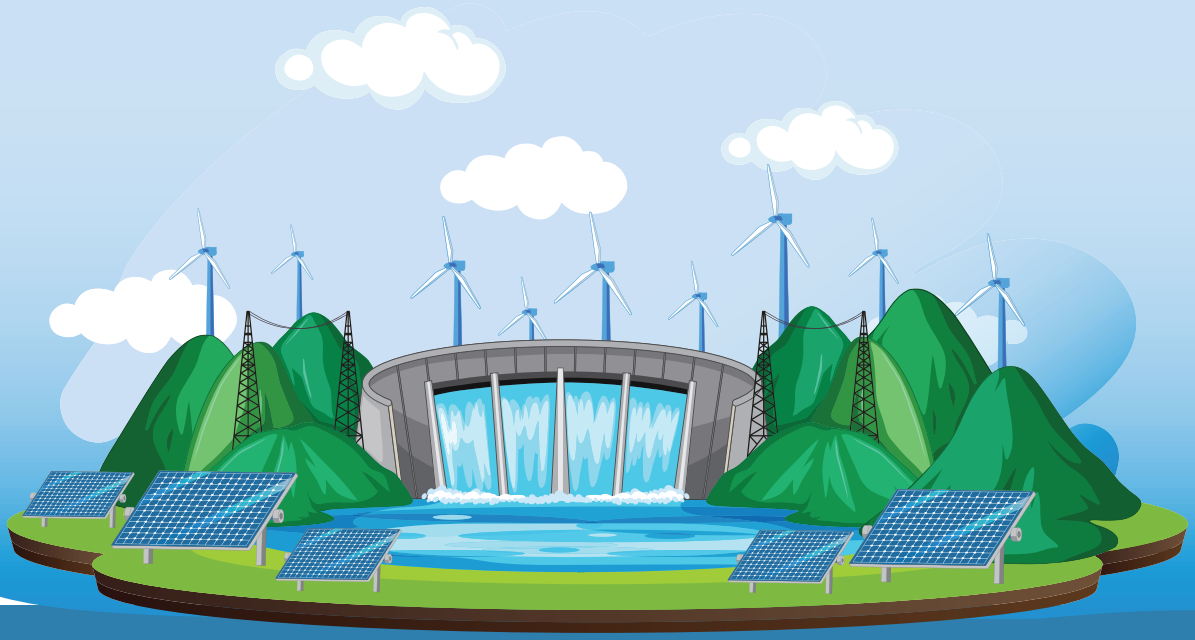
Alignment with green growth pathway

- The pipeline risks carbon lock-in and higher long-term tariffs due to large thermal capacity additions.
- Limited solar deployment suggests underutilisation of Assam's decentralised RE potential (RTS, floating solar).
- PSP investments are positive but need to be paired with higher RE penetration to unlock full value.
- A green growth pathway requires shifting from centralised thermal expansion: diversified, flexible, RE-led portfolio.

Section 2

A Thematic Review of Assam's Energy Transition

A Four-pronged Strategy Framework



Key sectoral strategies

Based on stakeholder consultations, primary data analysis, and review of the state's policy landscape, this section sets out four interdependent strategies that together define a coherent pathway for Assam's energy transition. No single strategy is sufficient; their combined and sequenced implementation is what creates a resilient, affordable, and clean energy system.



Strategy 1: Manage the thermal bridge- ensuring baseload reliability

It explores the state's strategy towards developing TPPs to reduce the cost of energy and ensure base load reliability in the grid.



Strategy 3: Building the storage backbone with PSP

PSP and BESS are the key enablers for grid stability. The state's push towards the PSP is a critical factor for the future of the state's energy storage projection.



Strategy 2: Accelerate solar deployment- scaling RTS, revitalising utility parks, and unlocking FSPV

The state is currently accelerating towards RTS with no utility-scale projects in place. The FSPV can also be explored for generating clean energy in waterbodies.



Strategy 4: Modernising the grid- investment strategy

The grid augmentation is simultaneous with the RE development. It discusses the state's focus towards smart grids, forecasting tools, and stronger network infrastructure for a resilient, RE-ready system.

Strategy 1: Manage the thermal bridge- Ensuring baseload reliability

- **Assam Thermal Power Generation Promotion Policy 2025:** Aims to improve grid stability, cut T&D losses (6%), and reduce CTU costs. The state cannot transition to a high-RE system overnight, as it would require ensuring baseload reliability without locking in carbon.

Risks of proceeding as planned

- **Emissions** 3,700 MW coal locks in emissions for 25–30 years vs climate goals.
- **Stranding risk:** Falling RE + storage may outcompete coal early. Supply chain risk can also cause disruptions
- **Financial risk:** ₹20,000+ crore; tariff impact if underutilised.
- **Compliance burden:** Ongoing costs for ash, water, and air norms.

Conditions under which it can be managed

- **Flexibility:** TPPs designed for low minimum load and fast ramping.
- **Co-firing:** Use biomass to reduce emissions and support local economy.
- **Ash use:** Fly ash utilisation mandatory in PPAs.
- **Sunset clause:** Review PPAs if RE + storage reaches cost parity early.

Table 4: Installed TPP capacity and generation 2025-26

Name	Estd Year	Capacity (Monitored)	Estimated Units generated (GWh) @PLF 63.33%
Kathalguri CCPP	1995	291	1,614
Lakwa TPP	1981	167	926
Namrup TPP	1965	140	776
NTPC Bongaigaon	2015	750	4,755

Source: National Power Portal

Table 5: Major TPP addition till 2035-36

Project	Type	Capacity (MW)	Status
Shakti Scheme (Phase I)	Coal/thermal	200	In progress, ETC 2025-26
Shakti Scheme (Phase II)	Coal/thermal	300	In planning, ETC 2028-29
Adani TPP, Dhubri	Coal/thermal	3,200	ETC 2035-36, LoA provided, EPC pending

Source: CEA, APDCL

- High reliance on imports to meet baseload demand: Proposed thermal capacity addition aims to bridge this gap, but introduces fuel, cost, and carbon lock-in risks that need proactive management.
- Beyond the 800 MW under construction, a diversified baseload strategy is essential such as Gas, Hydro, and Nuclear.



5 MW thermal installed capacity in Assam

- **2,000 MW capacity 2030**
- **5,000 MW capacity by 2035**
- **Energy self-sufficiency & net exporter**

Core Strategy

- Reduce external dependency and price risks
- Improve grid stability
- Reduce T&D losses by 6%
- Transform Assam into regional energy hub

Strategic implication

Thermal is a transition anchor ensuring reliability, reducing imports and enabling Assam towards a self-sufficient and export-oriented grid

Land Allotment

- Rs. 1 per bigha, 35 years lease.
- First come first serve

Infrastructure

- State support for roads and evacuation infrastructure

Power & Market

- Procurement via TBCB, merchant sale, open access, and bilateral

Fast track approvals

- Single window clearance within 60 days

Resource Assurance

- Priority water allocation and social infrastructure support

Implementation Architecture

- Nodal Agency – APDCL
- Project monitoring committee- high-level oversight
- PMU- Monitors milestones and ensures execution

Investment Model

- Private developers to lead projects
- State may take upto 27% equity stake
- Incentives aligned with Industrial policy 2023

The baseload requirement is a necessity; the state is strategically using thermal capacity as a transitional bridge to ensure grid reliability, while embedding flexibility and safeguards to align with its long-term clean energy transition. The state also needs to balance between too much dependence on coal and the associated risks.

Strategy 2: Accelerate solar deployment- scaling RTS, revitalising utility parks, & unlocking FSPV

The installed solar capacity of 533 MW represents barely 2% of the state's 27.7 GW technical potential. Scaling solar across all three segments, utility-scale ground-mounted, distributed rooftop, and floating solar on waterbodies, is the single highest-leverage action available to the state. The state, however, is focusing on ground-mounted solar and RTS at present.

Utility-scale solar:
Ground-mounted- *Revitalising utility parks*

Where things stand

- 216 MW of ground-mounted solar is operational. Another 25 MW is under the tendering process, which is the most significant near-term addition.
- iFOREST's GIS analysis identifies **27.7 GW of deployable wasteland potential**, with 550 MW immediately developable within 5 km of existing substations in districts including East Karbi Anglong, Hojai, Goalpara, and Dima Hasao.
- Largest SPPs: Amguri Solar Park (70 MW, ₹3.98/kWh) and Azure Power (90 MW, ₹3.34/kWh) demonstrate that competitive tariffs are achievable in Assam
- SPGPP 2025 offers concessional land (30-year lease), transmission charge exemptions, and SGST reimbursement, a competitive incentive stack

Key failures and concerns

- Private developer pipeline beyond government-led projects remains thin; DRE investments described by stakeholders as 'unstrategic' with 'lack of O&M' planning
- Land mobilisation is the primary bottleneck: even with identified wasteland, ownership data is fragmented and district-level coordination is slow
- The operating processes involving tendering and awarding are less transparent in nature.
- Equipment costs 20-25% higher than the national average due to the absence of Northeast RE manufacturing and supply chain

Way forward

- **Pipeline of 3 GW in 5 years**: Develop a year-wise competitive bidding calendar (500 MW/year) with pre-identified sites and ready land parcels of smaller size, removing land uncertainty as a first-order developer risk.
- **Single-window portal:** A portal similar to the existing RODALEE portal can be improved with newer features to apply for an installation similar to the PM-Suryaghar portal with fast-paced clearances, transparent procedures and uniform workflow.
- **Supply chain**: Engage MNRE to designate a Northeast RE manufacturing and logistics cluster: reducing equipment cost premium and creating local employment.



Assam Solar Power Generation Promotion Policy

Key objectives

- Develop 3,500 MW capacity by 2030
- Ensure reliable, affordable and secure solar supply
- Attract private and public sector investment
- Transform Assam into regional RE leader

Eligibility	State support	Enablers	Categories of SPP covered
• Plant capacity minimum – 1 kWp Maximum – 1000 kWp Tea/rubber category – 1000 kW AC	• Roads and evacuation infrastructure • Land identification • Pre-feasibility support	• Land & waterbodies allotment for FSPV, including BESS projects • Incentives to be provided as per the Industrial policy 2023	• Captive SPP • Grid-connected SPP • Open Access SPP • Agri-PV • Standalone BESS

Floating Solar- *Untapped opportunity*

- **Current status:** 1.72 lakh waterbodies (4th highest in India); iFOREST's study shows ~450 MW of viable potential across the non-flood plain regions
- **Key success:** ~100 kW pilot across 10 sites by AEDA; no scale-up roadmap yet.
- **Advanteges:** No land-use conflict; reduces water loss; supports rural/agri energy demand.
- **Way forward:** Notify standards and PPA framework; integrate with solar village scheme; launch ~50 MW pilot (3–5 sites by 2027); ensure ecological safeguards and community consent.



Distributed solar:

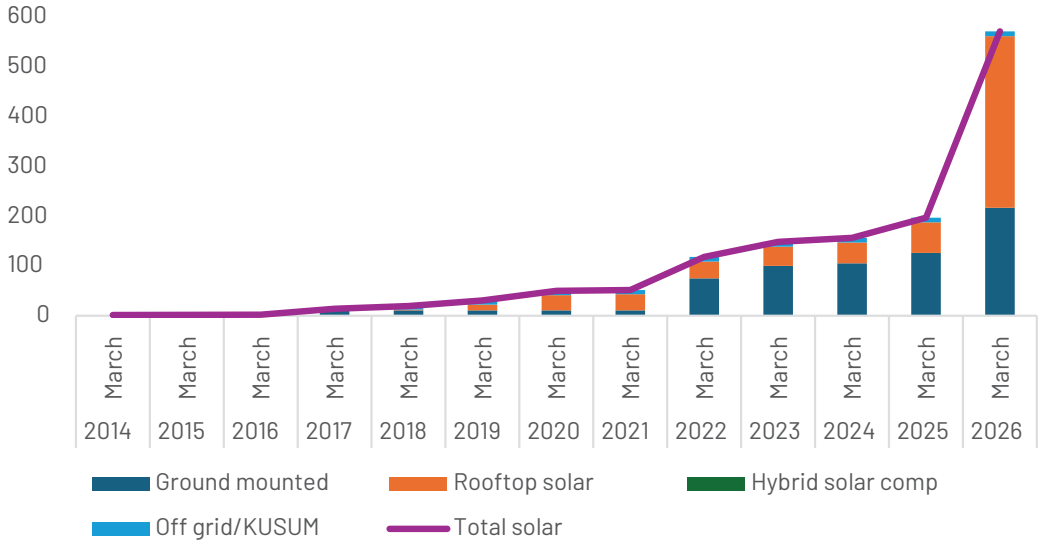
The residential rooftop solar success and C&I Gap

Rooftop solar has demonstrated the state's fastest RE growth rate: from 42 MW in March 2024 to 307 MW by March 2026; a nearly eightfold increase in two years driven by PM-SGMBY subsidies. 1 lakh residential consumers have been added in the last two years. However, the C&I segment, with installed RTS capacity of only ~41 MW against a technical potential of 7.3-13.4 GW remains deeply underdeveloped.

Current status: Fastest RE growth, RTS expanded from 42 MW (Mar 2024) to 307 MW (Mar 2026). However, C&I uptake remains low (~41 MW vs 7.3–13.4 GW potential).

Key success: ~1 lakh residential consumers added under PM-SGMBY; government rooftop installations progressing, though without a formal mandate.

Figure 9: Distributed solar installed capacity growth 2014-2026



Source: MNRE

Smaller successes in DRE (not yet scaled)

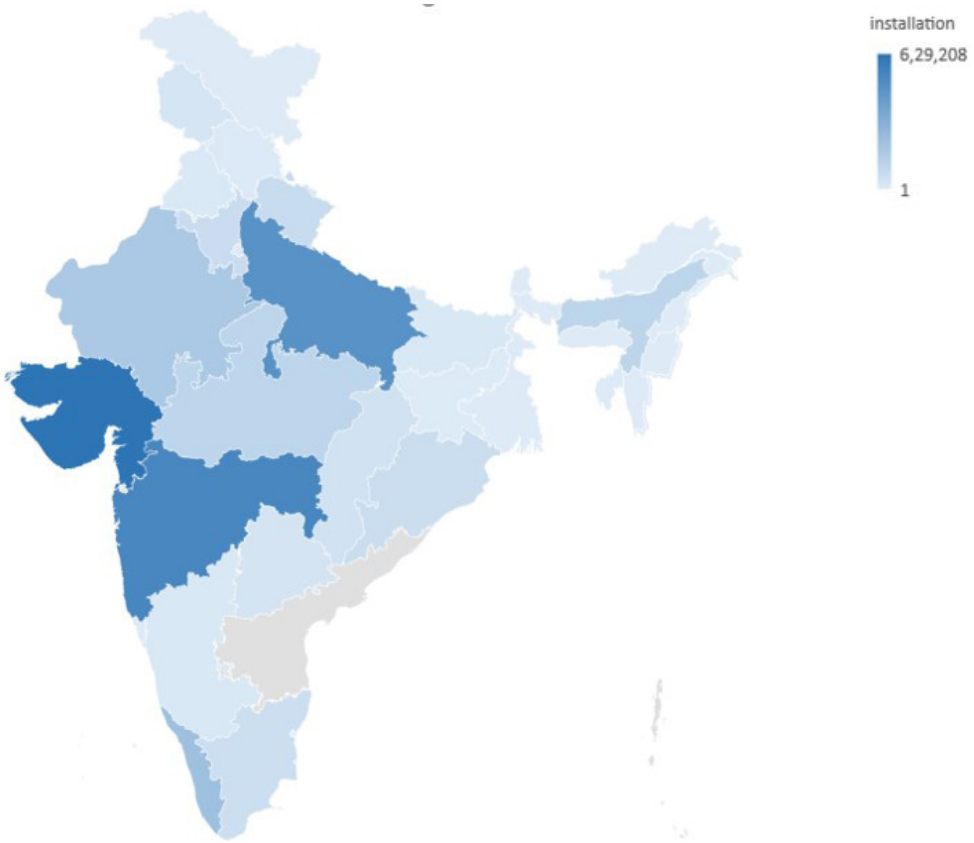
- Community solar pilots in limited locations demonstrate model viability but lack systematic scale-up plans
- Government building installations are ongoing, but without a structured programme or mandatory deployment target

Opportunities for growth

- Newer business models: The present model is CAPEX-only deployment; there is no RESCO, lease, or virtual net metering option available for C&I consumers who cannot mobilise upfront capital
- Grid outage problem: Summer load shedding causes grid-tied RTS to shut down, reducing consumer confidence and actual energy savings
- GNM / VNM regulations: The present regulations are yet to be notified, blocking apartment complexes, industrial estates, and commercial parks from adopting solar

The state is accelerating solar deployment by prioritising ground-mounted and RTS, while it could also transition towards a diversified, decentralised portfolio including FSPV supported by targeted regulatory .reforms and demand-side enablement

Figure 10: All India status under PM-SGMBY RTS installations



Source: PM-Suryaghar portal

Strategy 3: Building the storage backbone with PSP

Storage necessity: Essential for Assam; solar without storage worsens peak flexibility issues.

Targets: CEA mandates ~2.2 GW (4-hr) BESS; ICEP-2025 targets 1 GW BESS + 2 GW PSP by 2030; PSGPP raises PSP to 5 GW by 2035.

Progress gap: Limited to policy/draft stage; no significant implementation yet.

Current Status:

- **NGEAL BESS project:** 25 MW battery storage (APDCL–ONGC Tripura JV) is at standby which was supposed to be completed by 2026.
- **Regulatory gap:** Draft AERC BESS Procurement & Dispatch Regulations (2024) issued but not notified; no competitive tenders or ancillary/merchant market framework yet.
- **PSP pipeline:** Against a 5 GW target (PSGPP 2025), ~3 GW is already in the pipeline (Adani, Hinduja) over the next 7–10 years.

Energy storage obligation (ESO)

- MNRE notified 4% of energy consumption to be solar/wind, along with ESS, by 2030.
- Based on this obligation, ~720 MU of energy per annum is required to be provided with solar/wind + ESS.
- This is equivalent to 1.96 MU per day or ~490 MW (4hr storage) or ~245 MW (8hr storage).

PSP vs BESS

- **PSP:** Capital-intensive, long-life, low OPEX; suited for long-duration storage, needs specific geography
- **BESS:** Fast, efficient, but shorter life and higher replacement cost, not dependent on geography
- **Cost trend:** BESS LCOE falling rapidly with declining Li-ion costs and policy support (BNEF). The Li-ion battery pack costs are estimated to be reduced by 50% in the next 10 years.

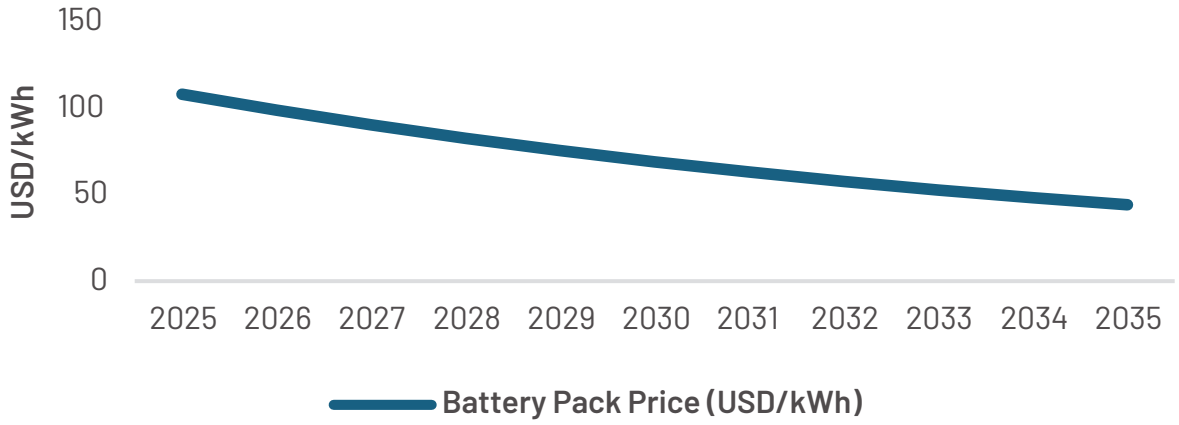
Table 6: Comparison parameters between PSP & BESS

Parameters	PSP	BESS
Construction time (years)	7-8	1-2
Plant Life (years)	40-50	15-20
CAPEX per MW (Rs.)*	6 – 10 Crore	2 – 7 Crore
OPEX per MW (Rs.)	1-2% of CAPEX annually	2-4% of CAPEX annually
LCOE (Rs./kWh)	4.5 – 8	6 – 10 *
Efficiency (Round trip)	75 – 80%	85 – 92%

** The prices of battery and levelized value are calculated based on the present battery pack prices and USD~INR conversion rates.*
Source: CEA, NITI Aayog, TERI, BNEF, AERC

The state understands the importance of energy storage as an essential component of the existing energy mix, and has identified PSP as the major anchor for it. However, BESS can also play a similar role in addition to PSP due to its advantages in start-up time, shorter installation time, and efficiency.

Figure 11: Li-ion battery price projection till 2035



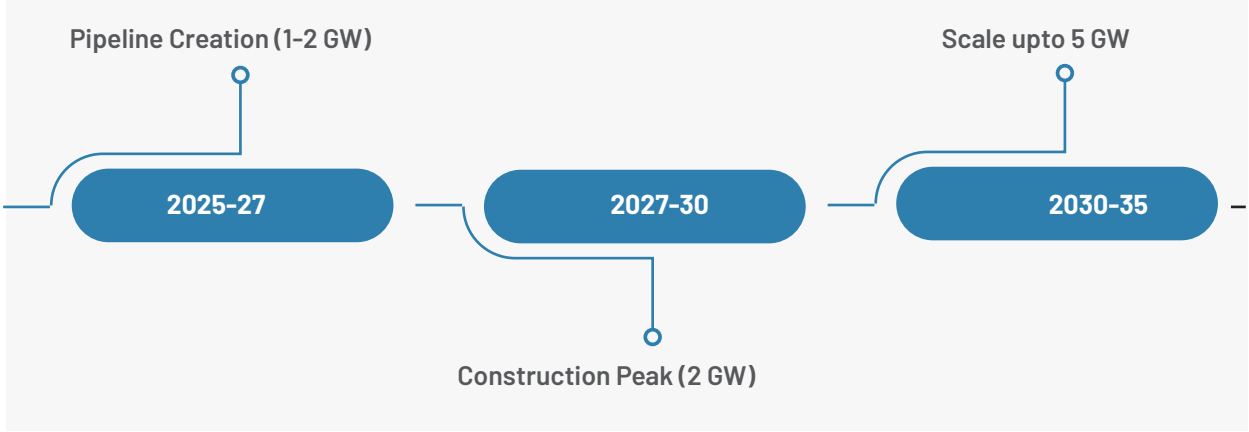
Source: iFOREST analysis based on BNEF data

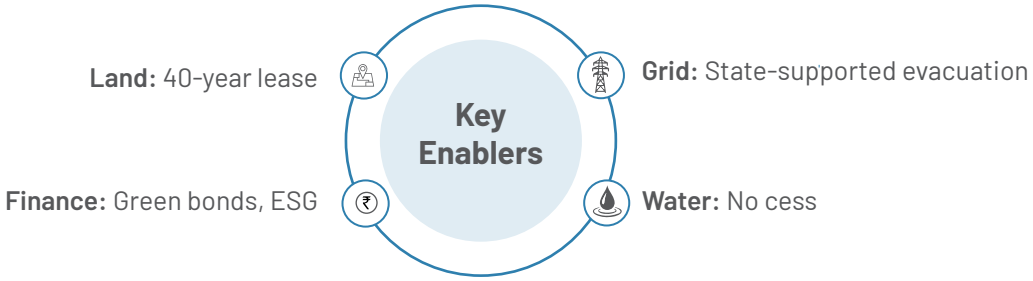
5 MW Pumped Storage in Assam

- 2,000 MW capacity 2030
- 5,000 MW capacity by 2035
- Energy self-sufficiency & net exporter



Resource Identification	Project Allocation	De-risking Framework	Financial Enablers	Governance
• Pre-feasibility studies	• Nomination (PSUs) • Competitive Bidding • TBCB route	• Land lease 40 years • Single window (60 days) • Water + infra support	• PPA + merchant • Green finance • Carbon markets	• PMC oversight • PMU tracking


Pipeline Creation (1-2 GW)
Scale upto 5 GW
2025-27
2027-30
2030-35
Construction Peak (2 GW)


Land: 40-year lease
Grid: State-supported evacuation
Key Enablers
Finance: Green bonds, ESG
Water: No cess

Strategy 4: Modernising the grid- Anchored by central schemes

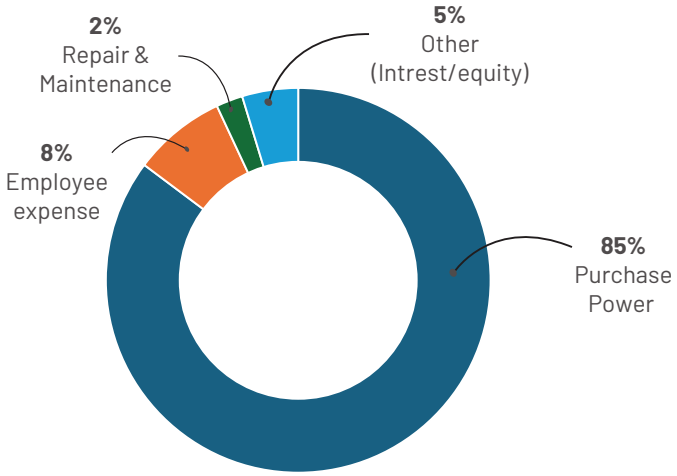
APDCL finances (FY 2025–26): Power purchase = 86% of ARR; with employee costs, 94% of ARR.

R&M gap: Only ₹263 crore (2.3% ARR) for maintaining a large network (7.4 million consumers across 19 circles, 45 divisions, 3,005 feeders, and 1,20,525 distribution transformers.

The case in numbers:

- **Loss impact:** Distribution losses at 14.5% cost APDCL ~₹1,100 Cr/year.
- **Savings potential:** Reducing to 10% saves 580 MU (~₹336 Cr/year); ₹58–65 Cr per 1% loss reduction.
- **Investment case:** ₹2,000 Cr reconductoring pays back in 6–7 years.
- **Priority area:** 11 kV losses (11%) » 33 kV (5%) → focus on sub-transmission.
- **Financial trend:** Revenue - expense gap narrow at present, estimated to broaden in future provided demand estimates are true. Underscores the need for an accurate and robust demand forecast
- **Capex trend:** Front-loaded, peaking in FY 2026–27(solar + RDSS); early focus on network strengthening and loss reduction; later shifts to consolidation and targeted upgrades (e.g., UG cabling).
- **Risk:** High reliance on a few large projects; sustained gains depend on effective utilisation and O&M.

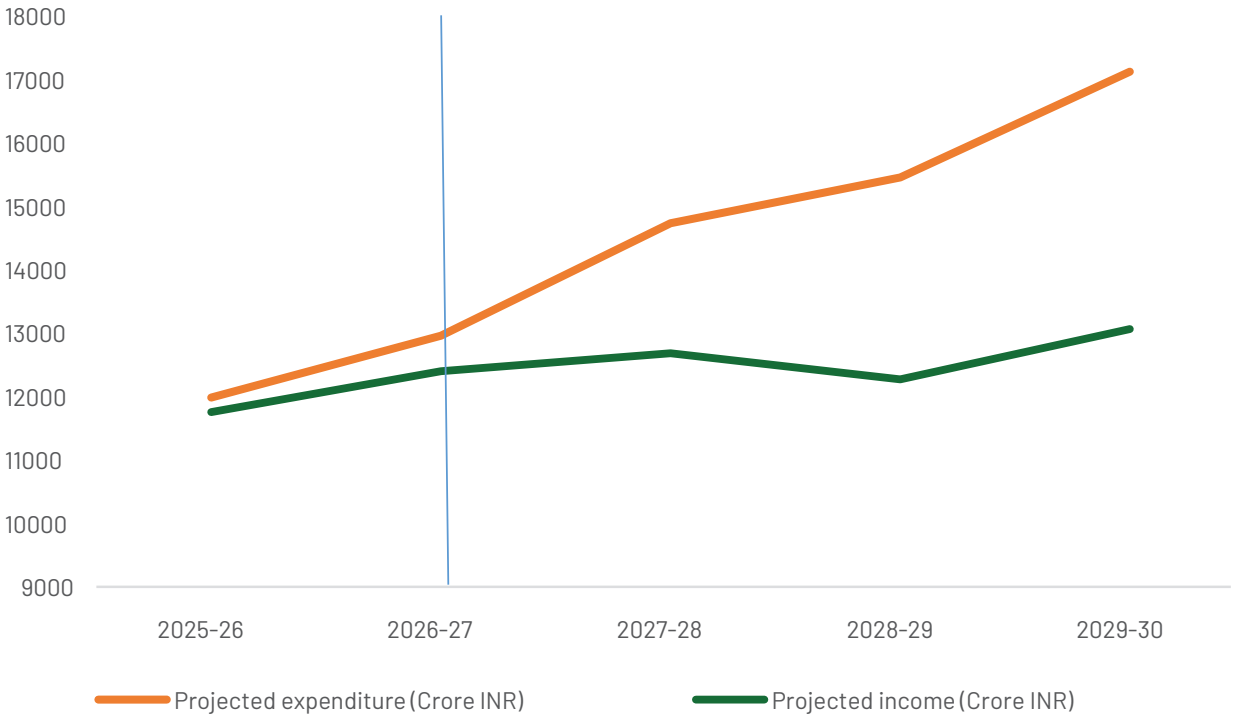
Figure 12: Financial expense breakup of APDCL for FY 2025-26



Source: AERC tariff order for APDCL, 2025

Under the current ARR and financial growth trajectory, the viability for self funded modernisation is in contention. Hence, for RE transition, external funding support or tariff/efficiency corrections are required.

Figure 13: Financial projection of APDCL till 2029-30



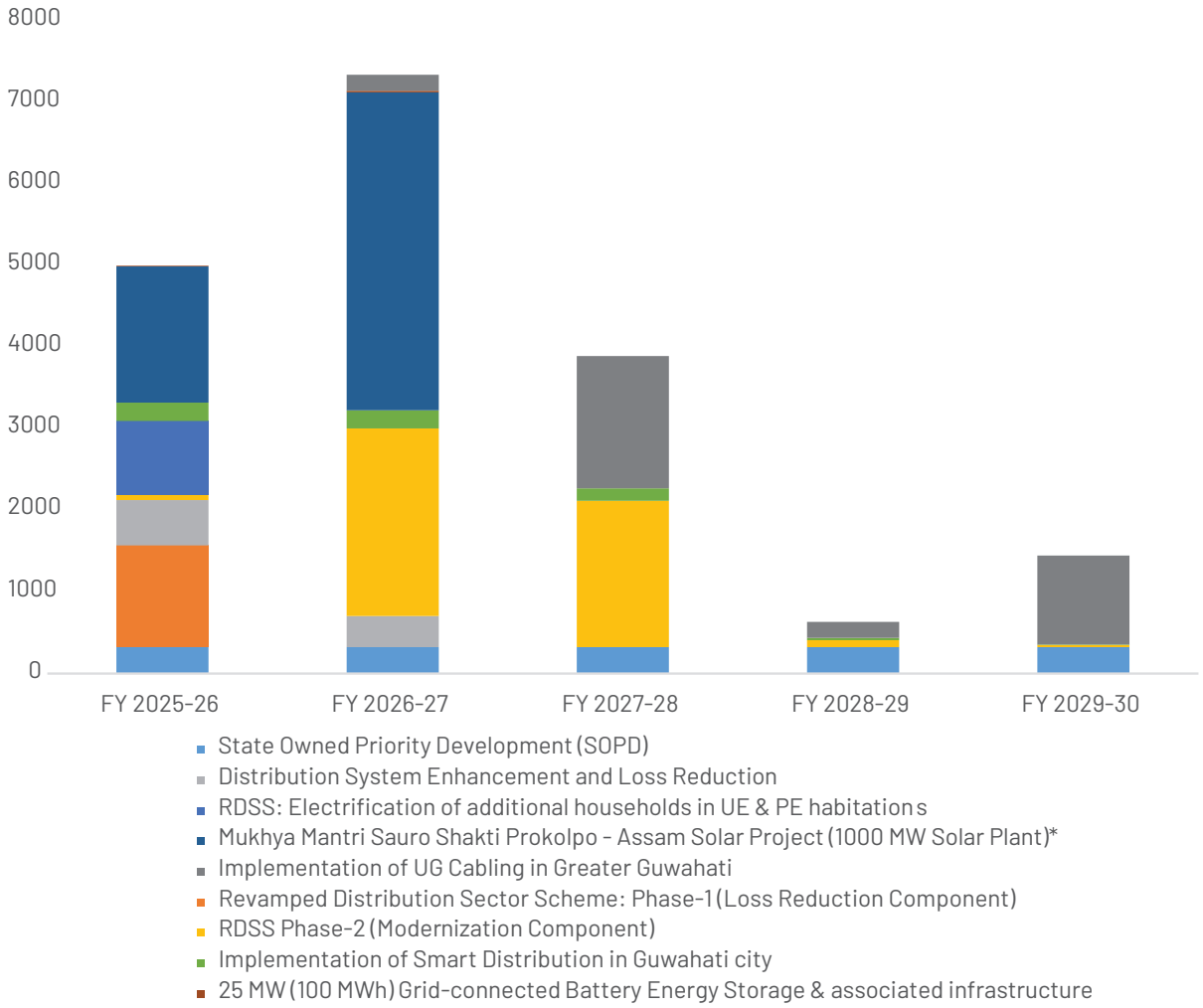
Note: The income of APDCL includes income from energy sales, non-tariff income & other income as mentioned in the AERC's tariff order for APDCL 2025-26
Source: AERC tariff order for APDCL, 2025

APDCL's planned investments over FY 2025–30 (₹13,300 crore across schemes) reflect a front-loaded, scheme-driven approach, with a strong reliance on centrally supported programs and externally funded interventions rather than a balanced, utility-led capital strategy.

Key insights:

- A significant share of planned investments is anchored in RDSS (Revamped Distribution Sector Scheme), indicating that grid strengthening and loss reduction efforts are largely subsidy-led, dependent on central funding flows and timelines.
- Urban-Centric and Infrastructure-Heavy Focus: Significant allocations to UG cabling in Greater Guwahati (₹1,600+ crore).
- Positive signals: Focus towards loss reduction, modernisation, and electrification, initial steps towards RE integration & BESS

Figure 14: APDCL investment projected between 2025-26 and 2029-30



**Note: The Mukhya Mantri Sauro Shakti Prokolpo Scheme is currently not operational. However, the state has diverted the funds under the PM-SGMBY scheme for CAPEX subsidy from 2024-25 for 1 lakh RTS installations. The data on the state subsidies is N/A.*

Source: AERC tariff order for APDCL, 2025

What is still missing: Gaps in Assam's RE Agenda

- Assam's four core strategies address the primary pathways for RE deployment. But stakeholder consultations and data analysis reveal a set of structural gaps, areas where neither current policy nor the four strategies, as currently designed, are adequate.

1. The policy & regulatory gap: No clear mandate for RE or thermal

- Assam introduced and subsequently withdrew the ICEP 2025 within the same year, while also announcing ambitious capacity targets under newly launched policies — including 3.5 GW solar under SPGPP-2025, 5 GW pumped storage under PSGPP-2025, and 5 GW thermal under TPGPP-2025. While these targets reflect the state's strong developmental intent, greater policy continuity and long-term clarity would help strengthen investor confidence, particularly for developers undertaking capital-intensive projects with long gestation periods
- Despite policy commitment, critical regulatory instruments that would operationalise the policy remain at the draft stage. This gap between policy announcement and regulatory notification is one of the most tractable but unaddressed bottlenecks, such as the finalisation of "Draft AERC BESS Procurement & Dispatch Regulations (2024)"," Draft Net Metering / Group Net Metering / Virtual Net Metering (2024)"," Draft Open Access Regulations (2024)".
- Given Assam's fiscal position and APDCL's financial stress (power purchase consumes 86% of ARR), conventional subsidy-led RE promotion is not a sustainable model. The policy framework has not adequately explored or institutionalised non-subsidy alternatives.

2. Financing for Transition

- APDCL's financial position fundamentally limits its ability to independently finance the grid modernisation and RE transition needed. Power purchase already consumes 86% of ARR; with employee costs, 94% of revenue is committed before any capital expenditure.
- The transition to 3.5 GW solar and 5 GW PSP cannot be achieved through central government funding alone. Developer-led investment requires bankable projects, payment security, and an active green finance ecosystem, none of which are fully operational in Assam.

3. Supply side constraint

- One of the disadvantages of RE plants in Assam is the benchmark cost, which is 20-25% over the national benchmark. The absence of local manufacturing drives the structural competitiveness problem. Every solar module, inverter, and battery system is transported from Gujarat, Rajasthan, or imported, adding logistics cost, time, and supply chain risk.
- Beyond policy statements, no operational mechanisms currently exist to reduce the logistics and supply chain disadvantage faced by RE developers and consumers in Assam. Immediate strategies, such as developing warehousing facilities for RE, component assembly, mandates for RE installation can help propel the supply side.
- One of the key progresses is the increasing number of vendors under PM-SGMBY, due to which the state saw a rapid rise in installations in the last year. The limited capacity across other RE sectors also limits the growth of installations.

4. Absence of comprehensive power system planning

- **Generation expansion not aligned with RCO/RPO requirements:** There is no published plan showing how the generation mix will meet RPO compliance (43.33% by FY 2030) while also delivering the state economic benefits of new RE investments and jobs. For example - 3.2 GW thermal pipeline exceeds the adequacy plan requirement and risks carbon lock-in for 25-30 years
- **Transmission planning gap:** AEGCL's transmission loss was estimated to be 3.2% (AERC) and is expected to go lower with the augmentation of cables in the grid. However, the planning of grid requirements for an RTS or solar-heavy generation is yet to be formulated. The SLDC lacks an RE forecasting cell; no mandate for day-ahead RE generation forecasting for plants above 100 kW.
- **Distribution planning:** The state's RE strategy is inclined towards RTS (expanded from 42 MW to 350 MW in two years), yet distribution network planning for high RTS penetration has not been undertaken. Other critical gaps include:
    - A DER integration framework or two-way metering standards for prosumers
    - No feeder-level solar hosting capacity study to identify circuits at risk of over-voltage or reverse power flow.
    - BESS planning in the distribution end of the grid.
    - HT/LT ratio of 0.34 makes the distribution network structurally vulnerable to losses and voltage issues from distributed generation injection

5. Mechanisms for Infrastructure support to investors

- Grid outages undermine consumer confidence in rooftop solar since systems fail to operate during outages. Without grid modernisation running in parallel with rooftop deployment, the residential success story will plateau.
- Recent experiences, stalled projects, delayed regulations, and missed targets have compounded the risk perception for RE investors in Assam. The state has to systematically addressed these concerns through investor-facing mechanisms.
- Through stakeholder consultations, confirmed that institutional bandwidth, procedural complexity, and access to finance, not resource availability; are the binding constraints on deployment speed. Structural effort is to be made to innovate around these constraints.

6. Non-solar RE focus



Untapped Potential

The current policy and strategy framework is overwhelmingly focused on solar (ground-mounted, rooftop, floating) and PSP. This leaves a substantial and largely low-cost non-solar renewable resource base entirely underdeveloped. Assam has real comparative advantage in biomass, small hydro, and waste-to-energy that is being systematically ignored.

- **Small Hydro (SHP):** 26 MW installed against 400-500 MW assessed potential (per stakeholder consultations) — less than 7% of potential developed
- **Biomass/Biopower:** 10 MW installed against 212 MW MNRE-assessed potential — less than 5% utilised; no state biopower programme exists
- **Waste-to-Energy (WtE):** No operational project in Guwahati or major urban centres despite a growing municipal solid waste challenge
- **Agri-PV (PM-KUSUM):** 1,238 beneficiaries against 4,000 sanctioned; a 70% shortfall with no documented recovery plan
- **Distributed Renewable Energy (DRE):** Only 10 MW off-grid capacity; draft mini/micro-grid regulations from 2017 never operationalised; RODALEE portal not functional



Overlooked Potential

C&I and captive RE

The major industrial sector in Assam comprises petroleum, oil, gas, cement, metals, and food processing, which represents the largest and most creditworthy potential RE offtake base. This is the segment where the economics are most compelling, yet it is the most underserved by the current RE agenda. The C&I also forms 25-30% of the total energy demand and connected load.

- C&I open access: 0 MU procured in FY 2024-25 despite HT energy tariffs of Rs. 7.69-9.09/kWh vs local solar APPC of Rs. 3.34-3.98/kWh — a 55-65% potential saving
- No industrial RE park, group captive scheme, or peer-to-peer trading mechanism to unlock this demand.
- Captive consumers include 541 MW of installed capacity, out of which 30 MW of solar is installed as of 2024 (CEA). Gas-dominated captive sector (365 MW gas vs 42 MW solar in 2023 per Energ: no transition plan to hybrid solar-gas or RE captive systems



Potential in emerging technologies

- **BESS:** Draft procurement & dispatch guidelines introduced in 2024. NGEAL joint venture to develop 250 MW BESS is still under discussion. Storage planning should also be distributed. A substation analysis of RTS with BESS requirements should be assessed for actual scaling up.
- **Green Hydrogen:** By leveraging central schemes like National Green Hydrogen Mission develop pilot projects near refineries. Fertizer industry can be good anchor for off-taking green hydrogen to produce green urea.
- **Biogas:** Currently, 2 MW of installed capacity under biomass generation. Biomass gasification + gas turbine plants can help in decentralised approach. Strong agriculture base + tea industry + livestock waste in the region
- **Small Module Reactor (SMR):** Identify potential sites (water availability + grid connectivity). Partner with central agencies (NPCIL, DAE) for feasibility

What stands between Assam's potential and its realisation is not resource scarcity, not technology unavailability, and not investor disinterest. It is institutional bandwidth, regulatory activation, financing architecture, and political commitment.

Section 3

Priority Actions

Way Forward



The state needs to move towards the following components/pillars for a RE transition:

1. **Power system preparation:** Assam's power system must transition from fragmented planning to a fully integrated, forward-looking framework that aligns generation, storage, and grid infrastructure with rapidly rising demand and RPO requirements. As demand doubles and peak stress intensifies, the focus must shift from energy adequacy to flexibility, reliability, and resilience. This requires strengthening sub-transmission networks, enabling RE forecasting and scheduling, and preparing the grid for high penetration of distributed and utility-scale renewables. Reducing import dependence will hinge on building a balanced local supply mix, combining solar with firm resources such as hydro, gas, and storage.

2. **Strategy for investment:** Assam's current investment approach—largely front-loaded and driven by central schemes—needs to evolve into a sustained, utility-led and market-enabled investment strategy. With limited fiscal headroom and high committed expenditures, the state must unlock private capital, green finance, and innovative business models to scale investments. This includes creating bankable project pipelines, ensuring payment security, and strengthening regulatory certainty. At the same time, investment prioritisation should shift toward least-cost, future-ready solutions such as solar, storage, and grid efficiency improvements, while carefully managing risks associated with long-term thermal investments.

3. **Strategy for non-RE solar:** While solar remains central to Assam's transition, a resilient energy system will require diversification beyond solar. The state has significant untapped potential in biomass, small hydro, and waste-to-energy, which can provide reliable, decentralised power and support rural and industrial demand. In parallel, firm and flexible resources such as hydro, gas, and RE-plus-storage systems will be essential to manage baseload requirements and seasonal variability. Looking ahead, Assam should also begin piloting emerging technologies like green hydrogen and biogas to support industrial decarbonisation and long-term energy security, ensuring a well-rounded and future-proof energy mix.

Three defining realities



Three non-negotiables:

- ✓ Scale solar parallel to non-solar RE
- ✓ Build storage as core infrastructure
- ✓ Modernise grid and institutions in parallel

- Assam stands at the confluence of three powerful forces: rapidly rising electricity demand that cannot be met by imports alone; a national policy architecture that makes RE the mandated pathway; and a resource base in solar, biomass, small hydro, and waterbodies; that is far richer than current deployment suggests.

- What stands between Assam's potential and its realisation is not resource scarcity, not technology unavailability, and not investor disinterest. It is institutional bandwidth, regulatory activation, financing architecture, and political commitment. The four strategies outlined in this report: managing the thermal bridge, accelerating solar, building the storage backbone, and modernising the grid are each individually tractable.

Assam's energy transition is not a resource challenge; it is an execution challenge. The opportunity is immediate, but the window is finite. The way forward lies in aligning planning, financing, and technology choices—transitioning to a diversified, RE-led and system-ready power sector that delivers reliability, affordability, and long-term sustainability.

Priority action matrix

Immediate (0–6 months)

#	Intervention required	Action	Lead	Enabler
1	Regulatory Intervention	Notify AERC BESS Procurement Regulations (draft already prepared in 2024)	AERC	Storage market
2		Notify Group Net Metering / Virtual Net Metering Regulations (draft 2024)	AERC	Rooftop + C&I RE
3		Notify AERC Open Access Regulations and publish simplified application portal	AERC / APDCL	C&I RE market
4	Grid augmentation and planning	Issue AEGCL Transmission Augmentation Plan for RE evacuation	AEGCL	Grid readiness
		Comprehensive power system planning of the state- RE mix, energy storage requirements, etc.	DoP/APGCL/AEGCL/ APDCL/AERC	Demand identification
5		Calculation of ideal coal-based/ gas-based and RE mix for the state	DoP / APGCL	Thermal risk management
6		Launch SLDC RE forecasting cell; mandate Day-Ahead forecasting for RE >100 kW	SLDC / AEGCL	Grid integration

Short term (6–18 months)

#	Intervention required	Action	Lead	Enabler
7	Policy/ scheme intervention	Notify AERC FSPV Technical Standards and model PPA framework	AERC / AEDA	Floating solar
8		Launch government building RESCO programme; target 200 MW by 2028	DoP / AEDA / Finance	Institutional RE
9	Project planning & implementation	Publish Assam Integrated Energy Scenario (2025-2035) with three RE pathway options	DoP / AERC	Strategic clarity
10		Restructure PM-KUSUM delivery under the model solar village facilitated by AEDA; target 2,000 pumps by 2027	AEDA / Agriculture	Agricultural RE
11		Launch 250 MW BESS competitive tender (bundled with 500 MW solar)	APDCL / DoP	Storage + solar
12		Introduce green EMI / ESCO consumer financing products for residential and C&I RTS	APDCL / Banks	Consumer finance
14		Commissioning of an identified PSP, as well as BESS Detailed Project Reports in identified locations	DoP / APGCL / CEA	Long-term storage
15	Grid augmentation	Fast-track RDSS HT smart metering for all 33 kV+ consumers; begin 11 kV rollout	APDCL / DoP	Grid modernisation

Medium term (18–48 months)

#	Intervention required	Action	Lead	Enabler
16	Collaborations	Establish Assam Energy Transition Council under Chief Minister; publish Annual RE Report	DoP/DoI&C/ IIT	Governance
17		Launch biopower programme targeting 100 MW biomass + 20 MW waste-to-energy in Guwahati	AEDA / Municipal/ APDCL	Biomass / WtE
18		Operationalise Northeast RE manufacturing / logistics hub; engage PLI scheme	AEDA / MNRE	Supply chain
		Explore opportunities in pilot-scale SMRs for feasibility	DoP/MNRE/ NPCIL/DAE	Emerging technologies
19		Initiate Green Hydrogen Regulatory Framework consultation; target BVFCL as anchor offtaker	DoP / AERC/ DoI&C	Emerging technologies

#	Intervention required	Action	Lead	Enabler
20	Project planning & implementation	Complete DER integration framework and two-way metering standards for prosumers	APDCL / AERC	Grid + DER
21		Deploy 50 MW FSPV pilot on 3-5 high-potential waterbodies	AEDA / APGCL	Floating solar
22		Issue AERC PSP Tariff Guidelines; advance PSP & BESS projects to financial closure	AERC / APGCL/ APDCL	Long-term storage

References

AERC. (2022). *Renewable Purchase Obligation*. Retrieved from Assam Electricity Regulatory Commission: https://aerc.gov.in/pages/sub/renewable-purchase-obligationrpo

AERC. (2024, December 4). *Draft Assam Electricity Regulatory Commission (Renewable Purchase Obligation and its Compliance) Regulations, 2010, (Fourth Amendment), 2024.* Retrieved from Assam Electricity Regulatory Commission: https://aerc.gov.in/regulations/1733311808.pdf

AERC. (2025, March 25). *Tariff Order.* Retrieved from Assam Electricity Regulatory Commission: https://aerc.gov.in/notice-files/1742989873.pdf

Bali, N., Mir, S., Singh, S., Bhattacharjee, T., & Rathour, D. S. (2025). *Rooftop Solar Potential in Assam.* New Delhi: iFOREST.

CEA. (2024). *FInal draft report on Resource Adequacy plan for the state of Assam.* New Delhi: Ministry of Power, Government of India.

CEA (2024). Report on Resource Adequacy Plan (Generation) for Assam (2025-26 to 2035-36) Version 3.0 https://cea.nic.in/wp-content/uploads/resource_adequacy_st/2025/07/RA_Report_Assam_2035_36.pdf

CEA. (2026). *Installed Capacity Report.* Retrieved from https://cea.nic.in/installed-capacity-report/?lang=en

CEA. (2026). *Power Supply Position Report.* Retrieved from https://cea.nic.in/power-supply/?lang=en

iFOREST. (2024). *Assam Renewable Energy Potential Reassessment: Focus of Solar, Wind, and Biomass.* New Delhi: iFOREST.

Kumar, M., & Singh, M. (2024). *Decoding ISTS charges waivers: Implication on system costs and procurement decisions.* New Delhi: International Forum for Environment, Sustainability and Technology.

Mir, S., Singh, M., & Bhattacharjee, T. (2026). *Accelerating Floating Solar Photovoltaic Development in Assam.* iFOREST.

MNRE. (2026). *MNRE Physical Progress.* Retrieved from MNRE: https://mnre.gov.in/en/physical-progress/

NITI Aayog. (2026, March 24). *Comparison of state-level renewable energy potential and installed capacity*. Retrieved from India Climate & Energy Dashboard: https://iced.niti.gov.in/analytics/re-installed-vs-potential-capacity

Shankar A, Saxena A K, and Mazumdar R. 2023. Pumped Storage Plants – Essential for India's Energy Transition. New Delhi: The Energy and Resources Institute. https://www.teriin.org/sites/default/files/2024-01/Pumped_Storage%20_Plants_Discussion_Paper_2023.pdf

ISGF. Energy Storage System Roadmap for India: 2019-32. https://cdnbbsr.s3waas.gov.in/s3716e1b8c6cd17b771da77391355749f3/uploads/2023/09/202309011777077840.pdf

BNEF https://about.bnef.com/insights/clean-transport/lithium-ion-battery-pack-prices-fall-to-108-per-kilowatt-hour-despite-rising-metal-prices-bloombergnef/

Nidhi Bali, Suhail Mir, Sureet Singh, Tattaiyya Bhattacharjee, Deepak Singh Rathour (2025). Rooftop Solar Potential in Assam. International Forum for Environment, Sustainability and Technology (iFOREST). New Delhi, India Annexures

Operational guidelines for Renewable Consumption Obligation COmpliance Mechanism, BEE India. https://beeindia.gov.in/WriteReadData/L45218/9003437506971259.pdf

Annexures

Annexure A1: Monthly peak demand in Assam from 2015 to 2025 as per CEA power supply position report

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
2015	1,380	1,380	1,320	1,396	1,382	1,395	1,487	1,412	1,435	1,491	1,379	1,312
2016	1,339	1,333	1,343	1,446	1,497	1,511	1,591	1,661	1,616	1,673	1,531	1,388
2017	1,466	1,398	1,392	1,414	1,649	1,744	1,675	1,735	1,770	1,822	1,515	1,479
2018	1,539	1,501	1,472	1,533	1,626	1,782	1,863	1,834	1,865	1,785	1,547	1,440
2019	1,491	1,417	1,743	1,910	1,935	2,032	2,021	2,193	2,134	1,964	1,727	1,592
2020	1,582	1,603	1,677	1,634	1,926	1,798	1,837	1,943	2,072	1,020	1,724	1,437
2021	1,461	1,485	1,751	1,908	1,952	2,062	2,104	2,109	2,104	2,126	1,636	1,475
2022	1,505	1,499	1,911	1,797	2,144	2,141	2,231	2,379	2,338	2,310	1,714	1,590
2023	1,651	1,572	1,670	2,013	2,219	2,307	2,390	2,353	2,413	2,237	1,932	1,553
2024	1,538	1,636	1,810	2,012	2,405	2,392	2,524	2,617	2,812	2,266	1,850	1,537
2025	1,577	1,644	1,911	2,084	2,336	2,717	2,805	2,582	2,812	2,413	1,917	1,684

Annexure A2: Power procurement costs as per AERC tariff order 2025

Average cost of supply (ACOS) Rs./kWh			8.72
Average power procurement cost (APPC) Rs./kWh			5.8
Procurement cost from major individual sources-			
Name	**Source**	**Location**	
a. APGCL	Thermal	Assam	5.9
a. NTPC new BTPS	Thermal	Bihar	
a. Amguri Solar Park	Solar	Assam	3.98
a. Azure Power SPV	Solar	Assam	3.34
a. Wind Power PTC	Wind	National	3.53
a. SECI Wind	Wind	National	2.73

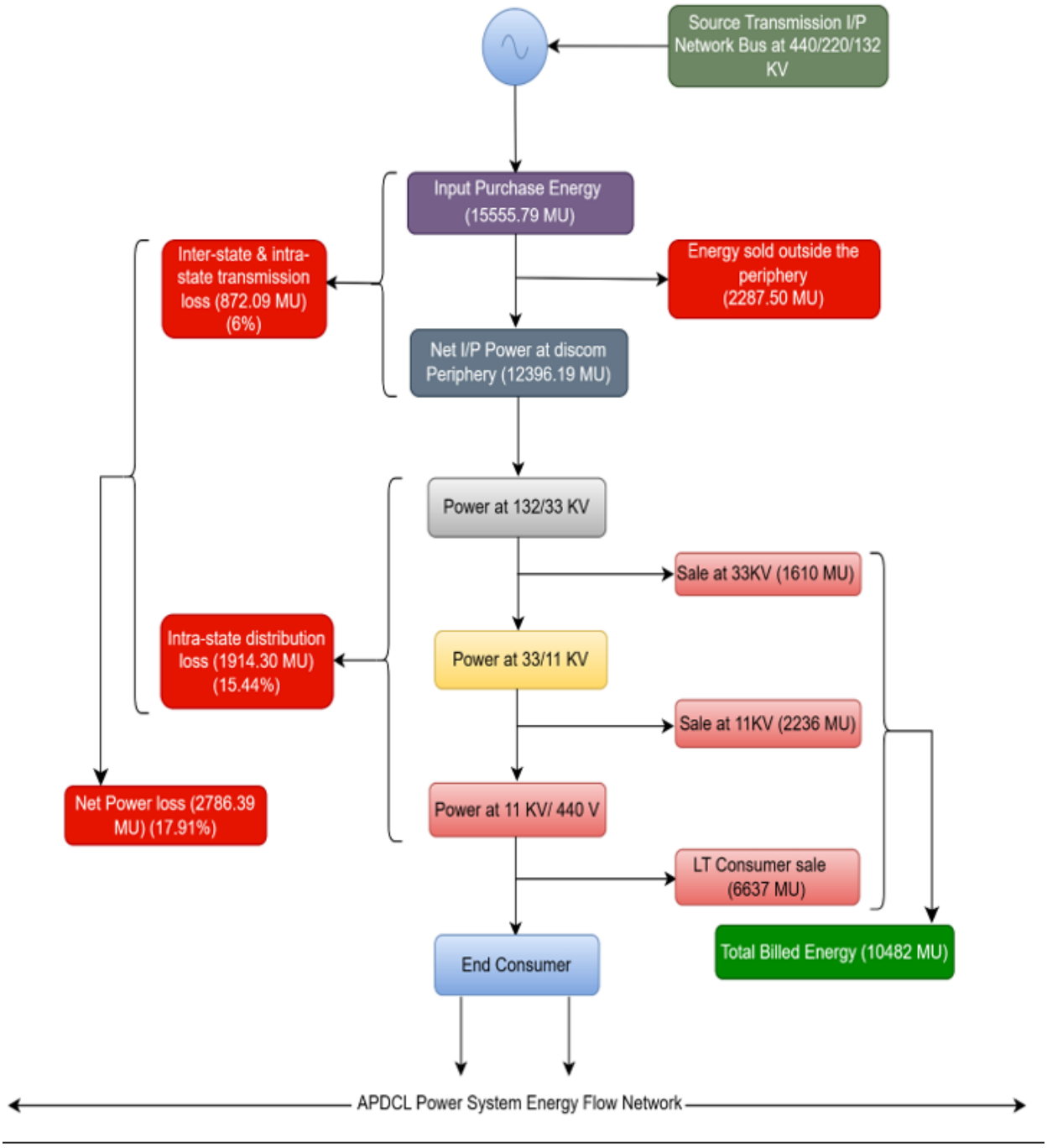
Annexure A3: Planned contracted capacity for Assam up to 2035-36 as per CEA resource adequacy report

Sl. No.	Name	Type	Expected Completion	Capacity (MW)	To be added/ retired
1	Shakti Scheme	Thermal	2025-26	200	Added
2	Shakti Scheme	Thermal	2028-29	300	Added
3	Talcher	Thermal	2027-28	154	Added
4	Subansiri	Hydro	2025-26	188	Added
5	Subansiri	Hydro	2026-27	78	Added
6	Punatsanggchu-I	Hydro	2025-26	58	Added
7	Punatsanggchu-II	Hydro	2026-27	116	Added
8	Lower Kopili	Hydro	2026-27	120	Added
9	APDCL	Solar	2027-28	500	Added
10	NGEAL	Battery	2025-26	25	Added
11	Agartala GT	Gas	2035-36	59	Retired
12	Assam Gas-Based	Gas	2035-36	164	Retired
13	Namrup	Gas	2035-36	139	Retired
14	Namrup Solar PV	Solar	2025-26	25	Added
15	Kulsi Hydro Project	Hydro	2029-30	55	Added

Annexure A4: Stakeholder consultation matrix

Priority	Stakeholder/ Role	Policy Insights	Financial / Market	Technical / System	Implementation
1	Secretary (Power), Government of Assam	State vision for energy transition; alignment with national RE targets	Investment requirements and financing models for scaling RE	Role of RE in Assam's long-term energy mix and energy security	Institutional coordination among Power Dept., APDCL, AEDA, AERC
2	Assam Electricity Regulatory Commission	Regulatory reforms needed for scaling RE (net metering, open access, storage)	Tariff design, market signals for RE, DISCOM financial sustainability	Grid flexibility mechanisms, storage integration	Regulatory barriers and enablers affecting RE deployment

Priority	Stakeholder/ Role	Policy Insights	Financial / Market	Technical / System	Implementation
3	APGCL & AEGCL (Generation & Grid)	Policy implications for state generation and grid planning	Investment and project development challenges in utility-scale RE	Integration of solar, hydro, and thermal; grid reliability with high RE	Role of state utilities in implementing large RE projects
3	APDCL - New & Renewable Energy	Policy effectiveness for rooftop solar, distributed RE and solar parks	Economics of rooftop solar and developer participation	Grid integration, forecasting, and distributed generation impacts on networks	PM Surya Ghar implementation, RE tenders, state solar programmes
3	APDCL - Commercial Division	How policies affect DISCOM procurement and RPO compliance	Power procurement costs, tariff impacts, cross-subsidy implications	Demand projections, load curves, peak demand trends	Challenges integrating RE into DISCOM planning and PPA portfolio
4	Nodal RE Agencies	Effectiveness of existing RE schemes and state policy implementation	Financing barriers for consumers and developers	Technology adoption trends (rooftop solar, solar pumps, DRE)	Institutional capacity, stakeholder awareness, and programme implementation gaps
5	Academic Expert	Long-term priorities for RE transition in Assam	Cost competitiveness of different RE technologies	Resource potential, solar/wind/hybrid pathways, storage requirements	Role of academia in research, modelling, and technology demonstration
5	Academic Expert	Long-term priorities for RE transition in Assam	Cost competitiveness of different RE technologies	Resource potential, solar/wind/hybrid pathways, storage requirements	Role of academia in research, modelling, and technology demonstration


Source Transmission I/P Network Bus at 440/220/132 KV
Input Purchase Energy (15555.79 MU)
Inter-state & intra-state transmission loss (872.09 MU) (6%)
Energy sold outside the periphery (2287.50 MU)
Net I/P Power at discom Periphery (12396.19 MU)
Power at 132/33 KV
Sale at 33KV (1610 MU)
Intra-state distribution loss (1914.30 MU) (15.44%)
Power at 33/11 KV
Sale at 11KV (2236 MU)
Net Power loss (2786.39 MU) (17.91%)
Power at 11 KV/ 440 V
LT Consumer sale (6637 MU)
End Consumer
Total Billed Energy (10482 MU)
APDCL Power System Energy Flow Network

Annexure A5: Summary of APDCL energy input and infrastructure

S. No.	Parameters	Period (1st Apr'24 – Jun'24)	Remarks (Source of Data)
A.1	Input Energy Purchased (MU)	15,555.78698	
A.2	Transmission Loss (%)	6%	CTU + STU Loss
A.3	Transmission Loss (MU)	872.09	
A.4	Energy sold outside the periphery (MU)	2,287.50253	Quantum sold through IEX, etc.
A.5	Open Access Sale (MU)	0	
A.6	EHT Sale	0	
A.7	Net Input Energy (received at DISCOM periphery or at distribution) (MU)	12,396.19	
A.8	100% metering available at 66/33 kV	No	
A.9	100% metering available at 11 kV	No	
A.10	% of metering available at DT	46%	~4000 DT smart meters under RDSS; communication pending for some DTs
A.11	% of metering available at consumer end	100%	
A.12	No. of feeders at 66 kV level	0	
A.13	No. of feeders at 33 kV level	754	
A.14	No. of feeders at 11 kV level	2,251	
A.15	No. of LT feeders	0	
A.16	Line length (ckt km) at 66 kV	0	
A.17	Line length (ckt km) at 33 kV	10,597.18	
A.18	Line length (ckt km) at 11 kV	1,11,946.809	
A.19	Line length (km) at LT level	3,59,776.93	
A.20	Length of Aerial Bunched Cables (km)	74,282.38	(4603.6 km at 11 kV, 27150.34 km at LT 3-ph, 42528.44 km at LT 1-ph)
A.21	Length of Underground Cables (km)	0	
A.22	HT/LT ratio	0.340611025	

Annexure A6: Financial Projections for APDCL under AERC tariff order (up to 2029-30)

Sl. No.	Particulars	FY 2025-26 APDCL	FY 2025-26 Approved	FY 2026-27 APDCL	FY 2026-27 Approved	FY 2027-28 APDCL	FY 2027-28 Approved	FY 2028-29 APDCL	FY 2028-29 Approved	FY 2029-30 APDCL	FY 2029-30 Approved
1	Power Purchase Expenses	10,204.75	10,020.60	11,615.98	10,559.45	12,571.68	10,728.99	11,958.97	10,202.89	12,408.94	10,862.08
2	O&M Expenses	1,695.50	1,410.70	1,840.79	1,509.30	2,157.36	1,618.68	2,477.47	1,733.46	2,662.74	1,853.98
	a) Employee Expenses	1,096.80	918.96	1,095.22	972.69	1,165.45	1,036.02	1,240.26	1,103.47	1,319.94	1,175.31
	b) R&M Expenses	451.69	263.19	585.46	291.68	817.66	320.17	1,047.72	348.66	1,136.85	377.15
	c) A&G Expenses	147.02	228.54	160.12	244.93	174.25	262.49	189.5	281.33	205.95	301.53
3	Depreciation	77.61	72.97	123.82	71.67	192.29	70.58	224.58	66.98	244.98	65.97
4	Interest and Finance Charges	100.9	10.94	114.72	11.76	121.68	12.7	125.42	13.87	127.11	15.27
5	Interest on Working Capital	-	-	0	-	12.1	-	40.63	-	56.34	7.38
6	Interest on CSD	62.22	62.22	62.22	62.22	62.22	62.22	62.22	62.22	62.22	62.22
7	Return on Equity	387.88	178.66	587.59	183.49	787.75	188.32	883.02	193.15	948.24	197.98
8	Other Debits (Bad Debts Provisioning)	6.21	-	6.21	-	6.21	-	6.21	-	6.21	-
9	Total Expenditure	12,535.07	11,756.09	14,351.32	12,397.89	15,911.30	12,681.49	15,778.52	12,272.56	16,516.79	13,065
10	Less: Non-Tariff	314.52	303.87	301.45	290.27	290.60	278.87	281.80	269.48	274.89	261.96
11	Less: Other Income	1,111.40	1,044.88	1,594.54	1,213.79	1,868.03	1,185.31	888.52	314.06	448.82	217.48
12	Aggregate Revenue Requirement	11,109.16	10,407.34	12,455.33	10,893.83	13,752.67	11,217.31	14,608.20	11,689.02	15,793.07	12,585.89

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