1.1 Resource Adequacy Plan for MSEDCL ST-DRAP AND MT-DRAP

1.1.1 Background:

1.1.2 Ministry of Power has notified Electricity (Amendment) Rules, 2022 in December 2022. Rule 16 (I) of the said rules stipulates that "A guideline for assessment of resource adequacy during the generation planning stage (one year or beyond) as well as during the operational planning stage (up to one year) shall be issued by the Central Government in consultation with the Authority". Accordingly, the Resource Adequacy Guidelines were notified in June 2023 by the Ministry of Power in consultation with the Central Electricity Authority.

1.1.3 Following the guidelines formulated by CEA, Maharashtra Electricity Regulatory Commission (MERC) has issued regulations - Maharashtra Electricity Regulatory Commission (Framework for Resource Adequacy) Regulations, 2024 to enable the implementation of Resource Adequacy framework by outlining a mechanism for planning of generation and transmission resources for reliably meeting the projected demand in compliance with specified reliability standards for serving the load with an optimum generation mix. The distribution licensee shall develop and prepare Long-Term Distribution Resource Adequacy Plan (LT-DRAP), Medium-Term Distribution Resource Adequacy Plan (MT-DRAP), and Short-Term Distribution Resource Adequacy Plan (ST-DRAP).

1.1.4 The Resource adequacy studies cover the horizons as:

- Long-term procurement plan for a period exceeding five years;
- Medium-term procurement plan for a period up to five years;
- Short-term procurement plan for a period up to one year.

1.1.5 As per the RA framework, the resource adequacy planning has the stages as Demand assessment and forecasting, Generation Resource Planning and Power Procurement planning. Also, the distribution licensee needs to develop and prepare Resource Adequacy Plans.

1.2 Demand Assessment and forecasting

- Demand assessment and forecasting is an important step for Resource Adequacy assessment. Long-term load forecasting is a critical aspect of energy planning, aiming to predict future electricity demand over extended periods, typically ranging from several months to years ahead. It plays a crucial role in capacity expansion planning of generation, transmission, and distribution systems.
- For forecasting the demand, a hybrid model approach is used to forecast the overall demand based on a combination of SARIMA and econometric methodologies. Consumer consumption categories like Domestic, Commercial,

Agriculture LT and HT Industries, which exhibit a high correlation with independent features such as GDP and weather data, have been forecasted using the econometric model. The remaining categories like Public water works, Street Light and Others are forecasted using time series model. While forecasting the demand, the effect of EV demand, Rooftop Solar, Solar Pump, Open Access etc. has been considered.

- Three distinct demand forecasting scenarios were developed for resource adequacy studies: Business as Usual (BAU), Aggressive, and Most Probable. These scenarios were generated using hybrid econometric and machine learning models, enabling detailed category-wise demand forecasting. The forecasts account for monthly demand variations driven by weather parameters and annual demand growth influenced by historical trends and macroeconomic factors like GDP. Additionally, all three scenarios integrate assumptions regarding future impacts of rooftop solar adoption, solar-powered irrigation pumps, agricultural load shifting, and electric vehicle (EV) penetration.

1.2.1 Business as Usual (BAU) Scenario

The BAU scenario assumes that future trends will closely follow historical patterns. GDP growth is projected using the compound annual growth rate (CAGR) based on current economic trends. Weather parameters such as temperature and precipitation are modelled in line with historical averages, assuming no significant deviation in climate patterns. This scenario reflects a stable evolution of demand and serves as a baseline for comparison against more dynamic projections. The BAU assumptions provide a conservative estimate, ensuring resource adequacy planning remains robust under steady-state conditions. The demand forecast and energy requirement (Excluding Open access) under this scenario is as follows:

Table 1 The demand forecast and energy requirement (Excluding Open access) in Business as Usual (BAU) Scenario

FY	Peak (MW)	Energy (MU)
2025-26	26398	177696
2026-27	29076	186397
2027-28	32133	195420
2028-29	33406	205275
2029-30	35084	216760
2030-31	36955	229360
2031-32	38930	242671
2032-33	41030	256847
2033-34	43251	271859
2034-35	45591	287692

1.2.2 Aggressive Scenario

The Aggressive scenario envisions higher economic growth and incorporates the potential impacts of climate change. GDP growth rates are projected at an accelerated pace, assuming favourable economic conditions and policy interventions that spur development. Additionally, rising temperatures and other weather parameters associated with climate change are factored into the demand forecast. This approach captures the possibility of increased energy consumption due to higher cooling needs and intensified demand across all categories. The Aggressive scenario offers insight into the challenges of meeting demand under rapid economic expansion and adverse climatic conditions. The demand forecast and energy requirement (Excluding Open access) under this scenario is as follows:

Table 2 Demand forecast and energy requirement (Excluding Open access) in Aggressive Scenario

FY	Peak (MW)	Energy (MU)
2025-26	26398	177696
2026-27	29076	186397
2027-28	32133	195420
2028-29	33406	205275
2029-30	35084	216760
2030-31	37111	231096
2031-32	39244	246177
2032-33	41504	262162
2033-34	43889	279031
2034-35	46396	296774

1.2.3 Most Probable Scenario

1.2.3.1 The Most Probable scenario employs advanced forecasting techniques to develop a balanced and realistic demand projection. GDP is forecasted using the Ordinary Least Squares (OLS) method, incorporating nuanced economic trends and their implications for energy demand. Weather parameters, critical to understanding monthly demand variations, are projected using a Seasonal Autoregressive Integrated Moving Average (SARIMA) model. The SARIMA model enhances accuracy by capturing both short-term seasonality and long-term climatic shifts. This methodology accounts for seasonal patterns and long-term trends in weather conditions, offering a more precise estimation of future demand. The demand forecast and energy requirement (Excluding Open access) under this scenario is as follows:

Table 3 Demand forecast and energy requirement (Excluding Open access) in Most Probable Scenario

FY	Peak (MW)	Energy (MU)
2025-26	25412	178792
2026-27	27943	187653
2027-28	30743	196113
2028-29	31767	204715
2029-30	32994	214281
2030-31	34467	226070
2031-32	35945	237942
2032-33	37434	249969
2033-34	38935	262127
2034-35	40459	274530

1.2.3.2 he "Most Probable" scenario provides a more realistic and scientifically grounded forecast compared to the two opposing perspectives: the conservative "Business as Usual" (BAU) assumptions and the ambitious, forward-looking "Aggressive" forecast. It seeks to incorporate elements of realism from both ends of the spectrum, combining measured caution with a forward-thinking outlook. In practical terms, this scenario adjusts the pessimism of BAU, which typically assumes minimal change or innovation and often highlights risks and constraints, with the optimism of the Aggressive forecast, which assumes rapid advancements, favourable trends, and higher risk tolerance. By doing so, the Most Probable scenario aims to strike a pragmatic balance that reflects likely outcomes under current and reasonably expected conditions. For policy and planning, the Most Probable scenario is invaluable because it aligns with the principle of "realistic optimism." It can be used to set achievable goals, design contingency plans, and foster sustainable development while remaining open to leveraging opportunities or mitigating risks. Thus MSEDCL opted for the Most Probable scenario.

1.2.3.3 The demand forecast in terms of Mus and MW (including & excluding Open Access and considering the effect of EV, Rooftop Solar, Solar Pump) is as below:

Table 4 Demand forecast in terms of Mus and MW (including & excluding Open Access and considering the effect of EV, Rooftop Solar, Solar Pump)

Years	MSEDCL's projections (With OA)		MSEDCL's projections (Without OA)	
	Peak Demand (MW	Energy (in MU)	Peak Demand (MW	Energy (in MU)
2025-26	27732	189520	25412	178792
2026-27	30520	199869	27943	187653
2027-28	33521	209646	30743	196113
2028-29	34287	219443	31767	204715
2029-30	35334	229966	32994	214281
2030-31	36958	242696	34467	226070
2031-32	38581	255494	35945	237942
2032-33	40208	268391	37434	249969
2033-34	41835	281367	38935	262127
2034-35	43469	294472	40459	274530

1.3 Generation Resource Planning

As per MERC Resource Adequacy Regulations, 2024, after the demand assessment and forecasting, following steps were carried out as part of generation resource planning: (a) capacity crediting of generation resources, (b) assessment of planning reserve margin, and (c) ascertaining resource adequacy requirement.

1.3.1 **Capacity crediting of generation resources**: The capacity credit (CC) is calculated by utilizing the top 10% load hours rather than top 250 load hours (slots) as defined in the MERC Regulations. This modified assumption has been considered after rigorous analysis of demand pattern of MSEDCL. The top load hours have been different historically and all the RE resources were not present historically, so if 250 slots are used then the past 5 years' data must be averaged to capture the actual capacity credit or else the capacity credit would not be justified if the load pattern is different. Hence a 10%-time frame is utilized to capture the capacity credit as most of the high demand slots would be in these slots. The capacity credits were also calculated based on the methodology prescribed by the MERC regulations, which uses the top 250 load hours. Even when using the MERC methodology, MSEDCL would be able to meet the Resource Adequacy Requirement (RAR).

1.3.2 **Assessment of planning reserve margin (PRM)**: Under the MERC Resource Adequacy Regulations, 2024, the Planning Reserve Margin (PRM) is determined by CEA or MERC based on reliability indices such as Loss of Load Probability (LOLP) and Normalized Energy Not Served (NENS). CEA targets LOLP at 0.2% and NENS at 0.05%, but has not yet specified a PRM value. While planning DRAP, MSEDCL has ensured that it is compliant as per the co-incident national peak as well. CEA has not published Long-term National Resource Adequacy Plan (LT-NRAP) and National Load Dispatch Centre (NLDC) has not published Short-term National Resource Adequacy Plan (ST-NRAP) as specified in Regulation 12.7. Hence, allocation of each distribution licensee's share in the state peak is unavailable as specified in Regulation 12.8.

Due to absence of data, MSEDCL has analyzed national load profile and based on the same, has tried to estimate the national coincident peak demand in its own distribution area for the forecast years as per Regulation 12.12 of MERC Resource Adequacy Regulations, 2024. MSEDCL has arrived at the provisional values of Resource Adequacy Requirement (RAR) by applying a PRM of 7%. The expected national co-incident peaks and respective RAR values are provided in table below.

Table 5 expected national co-incident peaks and respective RAR values

Financial Year	2025	2026	2027	2028	2029	2030
Expected National Coincident Demand (MW)	21831	23064	24542	26168	26710	27433
Provisional RAR (MW)	23359	24678	26260	27999	28580	29353

1.3.3 Resource adequacy requirement: Based on the capacity credit of various generating sources, RPO targets, PRM, the optimum capacity mix required to meet the projected demand is determined.

1.4 Existing Planned portfolio

The future portfolio is a detailed capacity planning consisting of the current contracted capacities. The optimal generation mix will add capacities required by MSEDCL over and above these contracted capacities. The planned portfolio has been curated considering the existing and the contracted capacities for the future. The table below shows the planned portfolio for MSEDCL (As provided for RA Study) till FY 2029-30.

Table 6 Planned portfolio for MSEDCL (As provided for RA Study)

Resource	Commissioned Capacity as of FY 2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Thermal	21891	660	-	-	-	228	855*
Nuclear	1191	-	-	-	-	-	-
Large-Hydro	2642	183	-	109*	313*	104*	-
PSP-Storage	250	-	-	-	-	-	324
Wind	2823	-	-	-	-	-	-
Solar	4331	2095	9605	4475*	-	-	-
Hybrid	-	-	300	2580*	-	-	-
FDRE	-	-	-	1468	-	-	-
Bagasse	2731	180	-	345**	345**	-	-
Small Hydro	314	3	-	-	-	-	-
Total	**36173**	**3121**	**9905**	**8977**	**658**	**332**	**1179**

Note: - Resource Adequacy Study is done based on the above capacity addition plan (Already Contracted but not commissioned and consent given capacities)

*Consent Given
** 690MW of biomass tender will be phased out in two years FY 2026-'27 and FY 2027-28

1.4.1 ST-DRAP for MSEDCL

Table 7 The ST-DRAP optimum capacity mix required as per the study

Year	1 Thermal	Solar	Wind	Hydro	SHP	Hybrid	FDRE	Biomass	Nuclear	PSP	DRE	Total capacity
2025-26	22551	16031	2823	2825	317	300	-	2911	1191	250	2675	51874

1.4.1.1 As per the Study report, MSEDCL has to contract the additional capacities over the planned capacity as submitted as input for study. The suggested additional capacity addition, as per study report, is as below:

Table 8 Suggested additional capacity addition

Year	Solar	Hybrid
	Contracted	Contracted
2025-26	9605	300

1.4.1.2 The MERC Resource Adequacy regulations mandates that the distribution licensee shall demonstrate to the Commission 100% tie-up for the first year and a minimum 90% tie-up for the second year to meet the requirement of their contribution towards meeting MSEDCL's peak.

1.4.1.3 To ensure the MSEDCL has 100% tie up in the first year, MSEDCL will commission the contracted capacities as per the following plan considered in the study:

- In FY 2024-25, the contracted capacities of 660 MW thermal, 183 MW hydro, 2,095 MW solar, 180 MW of bagasse and 3 MW of SHP, as per the plan considered in study will be commissioned.
- In addition to this, 9,605 MW of solar and 300 MW of hybrid will be commissioned as per the plan in study in FY 2025-26. Thus, MSEDCL will

have a total installed/commissioned capacity of 51874 MW (including 2675 MW DRE) by FY 2025-26.

With the capacity contracts in place, MSEDCL is positioned to demonstrate full compliance by achieving a 100% tie-up for the first year, as stipulated by the regulatory framework.

1.4.2 ST-DRAP Compliancy to RAR and evaluation of Resource Gap

1.4.2.1 The firm capacities for the optimal capacity mix for ST-DRAP are provided below:

Table 9 1.4.2.1 The firm capacities for the optimal capacity mix for ST-DRAP

Year	Thermal	Solar	Wind	Hydro	SHP	Hybrid	PSP	Nuclear	Biomass	Total firm capacity	Provisional RAR
2025-26	15518	12230	643	2163	71	175	225	953	435	32413	24678

1.4.2.2 Upon the successful commissioning of capacities as per MSEDCL's plan and as required under ST-DRAP in MERC RA regulations, MSEDCL will have a total firm capacity 32,413 MW.

1.4.2.3 Following the Regulation 12.2., MSEDCL has estimated the resource gap based on the resource adequacy plan and forecasted peak. For FY 2025-26, the resource gap is -674 MW indicating there is a surplus in firm capacity.

Table 10 Estimated the resource gap based on the resource adequacy plan and forecasted peak

Year	Total Firm Capacity	MSEDCL forecasted peak	Resource Gap
2025-26	26087	25412	-674

1.4.3 MT-DRAP for MSEDCL

Table 11 The MT-DRAP optimum capacity mix required as per the study

Year	Therma	Solar	Wind	Hydro	SHP	Hybrid	FDRE	Biomass	Nuclear	PSP	DRE	Total capacity
2025-26	22551	16031	2823	2825	317	300	-	2911	1191	250	2675	51874
2026-27	22551	20506	2823	2934	317	2880	1468	3256	1191	250	3234	61410
2027-28	22551	20506	2823	3247	317	2880	1468	3601	1191	250	4016	62850
2028-29	22551	24506	4823	3351	317	2880	1929	3601	1191	1183	5111	71443
2029-30	23379	28506	4823	3351	317	2880	2000	3601	1191	4601	6644	81293

1.4.3.1 As per the Study report, MSEDCL has to contract the additional capacities over the planned capacity as submitted as input for study. The suggested additional capacity addition, as per study report, is as below:

Table 12 Suggested additional capacity addition

Year	Thermal		Solar		Wind	Hydro	Hybrid	FDRE		PSP		Biomass
	Contracte d	Additional	Contracte d	Additional	Additional	Contracte d	Contracte d	Contracte d	Additional	Contracte d	Additional	Contracte d
2025-26	-	-	9605	-	-	-	300		-	-	-	-
2026-27	-	-	4475	-	-	109	2580	1468	-	-	-	345
2027-28	-	-	-	-	-	313	-	-	-	-	-	345
2028-29	228	-	-	4000	2000	104	-	-	461	-	933	-
2029-30	-	600	-	4000	-	-	-	-	71	324	3093	-
Total	**228**	**600**	**14080**	**8000**	**2000**	**526**	**2880**	**1468**	**532**	**324**	**4027**	**690**

1.4.3.2 MT-DRAP Compliancy to RAR and evaluation of Resource Gap

1.4.3.3 The firm capacities for the optimal capacity mix for MT-DRAP to meet the provisional RAR of MSEDCL are as below:

Table 13 Firm capacities for the optimal capacity mix for MT-DRAP to meet the provisional RAR of MSEDCL

Resource	2025-26	2026-27	2027-28	2028-29	2029-30
Thermal	15518	15518	15518	15518	16176
Solar	12230	15569	15580	18464	21370
Wind	643	669	666	1334	1335
Hydro	2163	2181	2245	2268	2270
SHP	71	71	71	71	71
Hybrid	175	1753	1761	1768	1779
FDRE	-	1384	1383	1520	1537
PSP	225	225	225	1065	4141
Nuclear	953	953	953	953	953
Biomass	435	458	504	499	490
Total Firm capacity	32413	38781	38907	43460	50121
Provisional RAR	24678	26260	27999	28580	29353

1.4.3.4 With the successful commissioning of capacities as per MSEDCL's plan (Considered in RA Study) and as suggested by the MT-DRAP, MSEDCL will have a total firm capacity which is well above the provisional RAR of MSEDCL, thereby making the MT-DRAP compliant with the national framework as well.

1.4.3.5 Following the Regulation 12.2., the projected capacity plan with optimal resource mix as per MT-DRAP overcomes the deficit in firm capacity in FY 2029-30.

Table 14 Projected capacity plan with optimal resource mix as per MT-DRAP

Year	Total Firm Capacity	MSEDCL forecasted peak	Resource Gap (-)Surplus/(+) Shortfall
2025-2026	26087	25412	-674
2026-2027	32494	27943	-4551
2027-2028	34146	30743	-3403
2028-2029	33990	31767	-2224
2029-2030	35303	32994	-2309

1.4.4 MSEDCL's Current Capacity Addition Plan

1.4.4.1 Against the additional capacity requirement, MSEDCL has planned capacity addition over and above as suggested in the study. Thus, as per MSEDCL's current plan total contracted capacity will be 85345 MW by 2029-30 (including DRE (Rooftop Solar) 6644 MW) against the 81293 MW as per the RA study result.

1.4.4.2 The abstract of Capacity mix as per MSEDCL's capacity addition plan is as below:

Table 15 Capacity mix as per MSEDCL's capacity addition plan

Year	Thermal + Gas	Nuclear	Large-Hydro	PSP-BSES Storage	Wind	Solar	Hybrid	FDRE	Bagasse + Biomass	Small Hydro	DRE	Total
FY-2025-26	22551	1191	2819	250	2855	16012	300	0	2911	317	2675	51882
FY-2026-27	22551	1191	2928	1000	2855	28377	1080	1468	3256	317	3234	68257
FY-2027-28	22551	1191	3241	1000	2855	29377	4344	1468	3601	317	4016	73961
FY-2028-29	22551	1191	3345	2750	2855	32377	4344	1468	3601	317	5111	79910
FY-2029-30	24379	1191	3345	4824	2855	32377	4344	1468	3601	317	6644	85345

1.4.4.3 MSEDCL's strategy of planning additional capacity beyond the study results is a precautionary measure to ensure energy security, grid stability, and a diversified energy mix. Given the uncertainties surrounding the timely implementation of projects, having a buffer with additional capacity allows MSEDCL to maintain a reliable supply of electricity.

The detailed Resource Adequacy Report of MSEDCL is annexed herewith as Annexure-

1.5 Submission of MSEDCL's Resource Adequacy Plan to Hon'ble Commission, Scrutiny by Hon'ble Commission and Reply thereof :

MSEDCL has submitted the ST-DRAP and MT-DRAP to Hon'ble Commission on 15-October-2024. Hon'ble Commission, through its letter dated November 18, 2024, to MSEDCL, has scrutinised and sought clarification/detailed analysis on MSEDCL's Short-Term and Mid-Term Resource Adequacy Plans (ST-DRAP and MT-DRAP). In this regards MSEDCLs compliance is as follows:

1.5.1 Demand Projections

1.5.1.1 In its letter, Hon'ble Commission highlighted concerns regarding the demand projections and growth factors considered for the Base Year (2025-26) in the demand forecast. MERC observed a substantial increase of approximately 14% in the energy requirement for FY 2024-25, stating that this could have an impact on projected energy requirements for subsequent years in the Resource Adequacy (RA) planning process.

1.5.1.2 However, the MTR data submitted shows that the power purchase forecast for FY 2023-24 (152,757 MU) is significantly less than the actual procurement, which stands at 166,970 MU, reflecting realistic growth in demand. This indicates that the projections for the Base Year are consistent with observed trends, addressing the concerns raised by MERC.

Table 16 Power quantum(MU) MTR Vs Actual

FY	MTR submitted	MTR Approved	Actual Power Purchased
2023-24	1,52,757	1,46,395	1,66,970
2024-25	1,55,469	1,48,137	1,70,093 (Projected in RA)

1.5.1.3 In the letter, the Hon'ble Commission also noted that MSEDCL submitted demand forecasts for only the most probable scenario as part of its Short-Term and Mid-Term Resource Adequacy Plans (ST-DRAP and MT-DRAP). However, as mentioned in the Resource adequacy Chapter, three distinct demand forecasting scenarios were developed by MSEDCL for resource adequacy studies: Business as Usual (BAU), Aggressive, and Most Probable. Further also, as mentioned in the Resource adequacy Chapter, the Most Probable scenario provides a more realistic and scientifically grounded forecast compared to the two opposing perspectives; the conservative BAU assumptions and the optimistic Aggressive forecast, serving as a reliable foundation for policy and planning.

1.5.2 Generation Resource Planning

1.5.2.1 While conducting the Resource Adequacy study, both the MERC Resource Adequacy Regulations and the Guidelines for Resource Adequacy Planning Framework for India published by the Central Electricity Authority (CEA) were taken into account. The methodologies specified in both documents were carefully analysed and considered for the study. The MERC Resource Adequacy Regulations suggest the use of the top 250 load hours for capacity credit calculations, while most research studies and system planning practices use the top 10% load hours for this purpose(also mentioned in the CEA's discussion paper).

1.5.2.2 Using the top 10% load hours for capacity credit calculations provides a broader perspective by accounting for a longer time horizon and varied demand periods. This approach considers approximately 876 hours annually, compared to 250 hours, and thereby captures more diverse demand scenarios, including those that may arise due to unexpected variations in the demand profile. Given the evolving nature of electricity consumption patterns, the top 10% methodology offers greater robustness in addressing demand variability and ensuring resource adequacy under dynamic conditions.

1.5.2.3 The capacity credits were also calculated based on the methodology prescribed by the MERC regulations, which uses the top 250 load hours. The Resource Adequacy study incorporated these capacity credits as well, ensuring comprehensive evaluation using both approaches. Even when using the methodology submitted by Hon'ble Commission, MSEDCL would be able to meet the Resource Adequacy Requirement (RAR) as the firm capacity is well above the MSEDCL's peak.

Table 17 Firm Capacity calculated as per MERC suggested methodology

Resource	2025-26	2026-27	2027-28	2028-29	2029-30
Thermal	15518	15518	15518	15518	16176
Solar	11372	13365	12321	13519	14248
Wind	259	261	262	573	600
Hydro	2184	2217	2307	2360	2365
SHP	76	78	79	79	81
Hybrid	152	1409	1304	1204	1135
FDRE	0	1315	1288	1662	1704
PSP	225	225	225	1065	4141
Nuclear	953	953	953	953	953
Biomass	718	769	858	920	933
Total Firm capacity	31456	36110	35115	37854	42336
Peak Demand	25412	27943	30743	31767	32994

1.5.2.4 The Central Electricity Authority (CEA) has not yet published the Long-Term and Short-Term National Resource Adequacy Plans (LT-NRAP and ST-NRAP), which are expected to include critical metrics such as reliability indices, Planning Reserve Margins (PRM), and Capacity Credit (CC) factors. However, the CEA has released a Resource Adequacy (RA) plan for the Maharashtra State Electricity Distribution Company Limited (MSEDCL). While the plan does not explicitly mention Capacity Credits, it assesses the Planning Reserve Margin at 7%.

1.5.2.5 MSEDCL has also arrived at 7% PRM through the resource adequacy study analysis. Furthermore, based on the allocated share in the national peak demand outlined in the LT-NRAP for the state, the State Transmission Utility (STU) and the MSLDC are required to allocate the corresponding share to each distribution licensee. However, in the absence of the published LT-NRAP, the Resource Adequacy Requirement is currently being assumed as the coincident peak demand plus a 7% Planning Reserve Margin.

1.5.3 Capacity Credit of Generation Sources

1.5.3.1 Hon'ble Commission in the letter, referred to the methodology outlined in the "Discussion Paper on Methodology for Capacity Credit of Generation Resources and Coincident Peak Requirement of Utilities under Resource Adequacy Framework" published by the Central Electricity Authority (CEA) on 18th November,2024.

1.5.3.2 The discussion paper provides key considerations for evaluating resource adequacy, including a comparison of demand during solar and non-solar hours. It emphasizes the importance of accurately assessing firm capacity requirements, proposing a methodology based on the 80th percentile of the top

5% of coincident demand values, supplemented by the Planning Reserve Margin (PRM) specified by the CEA.

1.5.3.3 It is pertinent to note that these methodologies are currently at the discussion stage. The CEA has sought feedback and comments from stakeholders across the sector, including utilities, generators, regulators, and other concerned entities. As these methodologies are still under evaluation, they need more insights and deliberations. Instead, they reflect the latest advancements and on-going developments in the field of resource adequacy planning.

1.5.3.4 The Hon'ble Commission has further highlighted that the State Load Dispatch Centre (SLDC) and the State Transmission Utility (STU) have adopted the methodology specified in the CEA's "Discussion Paper on Methodology for Capacity Credit of Generation Resources and Coincident Peak Requirement of Utilities under Resource Adequacy Framework" for calculating Coincident Peak Demand and Capacity Credit (CC) during solar and non-solar hours.

1.5.3.5 It is important to note, however, that the methodologies referenced in the regulations and guidelines published by MERC and CEA differ from those in the discussion paper. The existing regulations predominantly utilize a top net load-based approach or a top load-based approach for resource adequacy assessments. The preparation of MSEDCL's Short-Term and Mid-Term Resource Adequacy Plans (ST-DRAP and MT-DRAP) adhered to these existing regulatory frameworks and guidelines, ensuring compliance with established processes and methodologies.

1.5.3.6 The resource adequacy plans were developed through rigorous studies and analyses, leveraging the methodologies specified in the current regulations and guidelines issued by Hon'ble Commission and CEA. These studies were conducted with due diligence to meet the regulatory requirements in force at the time of submission. While the methodologies proposed in the CEA's discussion paper offer valuable insights, they remain at the consultative stage and are yet to be finalized following stakeholder feedback.

1.5.3.7 The discussion paper, having been published recently, represents a progressive step in methodology development and is subject to further deliberations and refinements. Until these methodologies are finalized and incorporated into the regulatory framework, the studies and plans submitted by MSEDCL are in alignment with the prevailing regulations and guidelines, ensuring consistency and adherence to established procedures.

1.5.3.8 As the study is required to be conducted annually, and since the new methodologies are not yet finalized, the study for this year was conducted as per the existing regulations. It is respectfully requested that the new methodologies, once finalized, be adopted and implemented for the study from the next year onward.