

महाराष्ट्र शासन  
उद्योग, ऊर्जा, कामगार व खनिकर्म विभाग  
शासन निर्णय क्रमांक:-अपाऊ-२०२५/प्र.क्र.२२/ऊर्जा-७  
हुतात्मा राजगुरु चौक, मादाम कामा रोड,  
मंत्रालय, मुंबई- ४०० ०३२.  
दिनांक:- १८ मार्च, २०२६.

**वाचा :-**

१. उद्योग, ऊर्जा, कामगार व खनिकर्म विभाग शासन निर्णय क्र. अपाऊ-२०२०/प्र.क्र.१३७/ऊर्जा-७, दि. ३१.१२.२०२० व त्याअंतर्गत निर्गमित करण्यात आलेली शुध्दीपत्रके.
२. उद्योग, ऊर्जा, कामगार व खनिकर्म विभाग शासन निर्णय क्र.अपाऊ-२०२०/प्र.क्र.१३७ (अ) /ऊर्जा-७, दि. ११.०५.२०२२
३. उद्योग, ऊर्जा, कामगार व खनिकर्म विभाग शासन निर्णय क्र. अपाऊ-२०२१/प्र.क्र.२२४/ऊर्जा-७, दि. ३०.०६.२०२२

**प्रस्तावना :-**

राज्यातील वाढते औद्योगिकीकरण व शहरीकरणामुळे दिवसेंदिवस वीजेच्या मागणीमध्ये मोठ्या प्रमाणात वाढ होत आहे. वीजेची निर्मिती प्रामुख्याने कोळसा, पेट्रोलजन्य पदार्थ, नैसर्गिक वायू या पारंपरिक ऊर्जा स्रोतांपासून तसेच, सौर, पवन, सहवीज, जल इत्यादी नवीकरणीय ऊर्जा स्रोतांपासून केली जाते. पारंपरिक ऊर्जा संसाधने मर्यादित स्वरूपात असून, ती भविष्यात संपुष्टात येणारी आहेत. तसेच, अशा स्रोतांचा वापर केल्याने प्रदुषण, वैश्विक तापमान वाढ इत्यादी समस्या निर्माण होतात. जागतिक कार्बन उत्सर्जनाचा मोठा भाग ऊर्जा उत्पादन आणि वीजेच्या वापराशी संबंधित आहे. केंद्र शासनाने नवीकरणीय ऊर्जा स्रोतांचे महत्त्व विचारात घेऊन नवीकरणीय ऊर्जा स्रोतांपासून सन २०३० पर्यंत ५०० गिगावॅट वीज निर्मिती करण्याचे उद्दिष्ट निश्चित केले आहे. सदर उद्दिष्टामुळे भारताच्या सन २०७० पर्यंतच्या Net Zero Emission चे ध्येय प्राप्त करण्यास मदत होणार आहे. भारताने सन २०३० पर्यंत कार्बन उत्सर्जन ४५ टक्क्यांनी (सन २००५ च्या तुलनेत) कमी करण्यास आणि एकूण वीज निर्मितीच्या ५० टक्के क्षमता नवीकरणीय ऊर्जा स्रोतांपासून निर्मिती करण्यास कटीबद्धता दर्शविली आहे.

महाराष्ट्र राज्यात मोठ्या प्रमाणावर वाढत असलेल्या औद्योगिकीकरण आणि शहरीकरणामुळे वीजेची मागणी वाढली आहे. यासाठी आवश्यक वीज बहुतांशी पारंपरिक ऊर्जा स्रोतांद्वारे निर्माण केली जाते. मात्र, आता नवीकरणीय ऊर्जा स्रोतांपासूनच्या ऊर्जा निर्मितीकडे कल वाढत आहे. राज्यामध्ये नवीकरणीय ऊर्जा क्षेत्राला प्रोत्साहन देण्याकरीता शासनाद्वारे यापूर्वी सन २००८, २०१५ व २०२० मध्ये राज्याचे अपारंपरिक ऊर्जा निर्मिती धोरणे जाहिर केली आहेत. सन २०१५ व सन २०२० च्या अपाऊ धोरणाच्या अंमलबजावणीमुळे राज्याने फेब्रुवारी, २०२५ पर्यंत एकूण १८.५ गिगावॅट इतकी अपारंपरिक ऊर्जा निर्मिती क्षमता प्राप्त केली आहे. राज्याच्या एकूण ऊर्जा निर्मितीमध्ये नवीकरणीय ऊर्जेचा जवळपास १५ टक्के इतका हिस्सा आहे. राज्याने मार्च, २०२५ मध्ये ३०.७ गिगावॅट इतकी वीजेची मागणी नोंदविली आहे. ही वीजेची मागणी सन २०१५ पासूनची सर्वाधिक आहे. सन २०१५ मध्ये २०.४ गिगावॅट इतकी वीजेची मागणी होती यामध्ये जवळपास ५० टक्के इतकी वाढ झाली आहे. याशिवाय,

सन २०१४-१५ मध्ये राज्याने १३३ बिलियन युनिट इतका वीज पुरवठा केला असून, यामध्ये ५२ टक्के वाढ होऊन सन २०२४-२५ मध्ये २०१.८ बिलियन युनिट इतका वीज पुरवठा केला आहे. यानुसार राज्यामध्ये सन २०३० पर्यंत जवळपास २६०-२७० बिलियन युनिट इतकी वीज मागणीमध्ये वाढ होऊ शकते.

२. मा.महाराष्ट्र वीज नियामक आयोगाने आरपीओ (RPO) आणि आरईसी (REC) विनियमामध्ये सुधारणा केल्या असून, सन २०३० पर्यंत आरपीओ (RPO-Renewable Energy Purchase Obligation) आणि ESO (Energy Storage Obligation) करीता अनुक्रमे ४३.३३ टक्के आणि ४ टक्के इतके उद्दिष्ट निर्धारित केले आहे. याशिवाय, ग्रीन ओपन अॅक्सेस विनियम, सौर आणि पवन ऊर्जा निर्मितीकरीता पूर्वानुमान, काल व परिणाम निर्धारण (शेड्युलिंग) आणि तफावतीची हिशोबपूर्ती विनियम, सोलर रुफटॉप करीता Grid Interaction RE विनियम इत्यादी नवीकरणीय ऊर्जेशी संबंधित विनियमामध्ये मा. वीज नियामक आयोगाने सुधारणा केल्या आहेत.

सौर आणि पवन ऊर्जा स्रोतांमधील बदल आणि अस्थिरता यामुळे ग्रिडच्या उपयुक्त संचलनाकरीता अडचणी निर्माण होत आहेत. या नवीकरणीय ऊर्जा स्रोतांपासून निर्माण होणारी अधिकची ऊर्जा स्टोरेज करुन ती Low RE hour वेळी वापर करण्याकरीता “एनर्जी स्टोरेज” सिस्टम उपयुक्त ठरू शकतात. ही सिस्टम ग्रिडच्या व्यवहार्य संचलनाकरीता देखिल उपयुक्त ठरते.

राज्य शासनाचे यापूर्वीचे अपारंपरिक ऊर्जा निर्मिती धोरण, मा.महाराष्ट्र वीज नियामक आयोगाचे विविध विनियम, नवीकरणीय ऊर्जा आणि एनर्जी स्टोरेजची पुढील दहा वर्षातील मोठ्या प्रमाणात होणारी वाढ आणि गरज लक्षात घेता नवीन व नवीकरणीय ऊर्जा आणि एनर्जी स्टोरेजच्या विकासाकरीता “महाराष्ट्र नवीकरणीय ऊर्जा आणि ऊर्जा साठवणूक धोरण-२०२५-२६ ते २०३५-३६” ला मान्यता देण्याची बाब शासनाच्या विचाराधिन होती.

### **शासन निर्णय :-**

या शासन निर्णयाद्वारे परिशिष्ट-अ मध्ये सोबत जोडल्याप्रमाणे “महाराष्ट्र नवीकरणीय ऊर्जा आणि ऊर्जा साठवणूक धोरण-२०२५-२६ ते २०३५-३६” ला मान्यता देण्यात येत आहे. सदर धोरण या शासन निर्णयाच्या दिनांकापासून लागू होईल.

२. या शासन निर्णयाद्वारे संदर्भाधीन क्र. १ येथील शा.नि. व संबंधित शुध्दीपत्रकान्वये निर्गमित करण्यात आलेले अपारंपरिक ऊर्जा निर्मिती धोरण-२०२० तसेच संदर्भाधीन क्र. २ येथील शासन निर्णयान्वये निर्गमित करण्यात आलेले अपारंपरिक ऊर्जा निर्मिती धोरण-२०२० अंतर्गत प्रोत्साहनात्मक सुधारणा अधिक्रमित करण्यात येत आहेत.

३. “महाराष्ट्र नवीकरणीय ऊर्जा आणि ऊर्जा साठवणूक धोरण-२०२५-२६ ते २०३५-३६” या धोरणातील तरतुदीनुसार आवश्यक ते कार्यान्वयन आदेश संबंधित प्रशासकीय विभागाने / कार्यालयाने / कंपनीने विहित मुदतीत निर्गमित करावेत. तसेच मा. महाराष्ट्र विद्युत नियामक आयोगाने या धोरणातील तरतुदींच्या अनुषंगाने त्यांचेशी संबंधित नियमने इत्यादीमध्ये आवश्यकतेनुसार सुधारणा करावी, अथवा आवश्यकतेनुसार नवीन नियमने निर्गमित करावीत.

४. या धोरणातील तरतुदींसंदर्भात ऊर्जा विभागाचे स्पष्टीकरण अंतिम राहिल.

५. सदर शासन निर्णय दिनांक २२.०२.२०२६ रोजी झालेल्या मा. मंत्रिमंडळ बैठकीमध्ये घेण्यात आलेल्या निर्णयाच्या अनुषंगाने निर्गमित करण्यात येत आहे.

सदर शासन निर्णय महाराष्ट्र शासनाच्या [www.maharashtra.gov.in](http://www.maharashtra.gov.in) या संकेतस्थळावर उपलब्ध करण्यात आला असून त्याचा सांकेतांक क्र. २०२६०३१८१८४८३६५८१० असा आहे. हा आदेश डिजीटल स्वाक्षरीने साक्षांकित करून काढण्यात येत आहे.

महाराष्ट्राचे राज्यपाल यांच्या आदेशानुसार व नावाने.

(जयंत सागडे)

अवर सचिव, महाराष्ट्र शासन

प्रत:-

१. मा.राज्यपाल यांचे प्रधान सचिव.
२. मा. मुख्यमंत्री यांचे अपर मुख्य सचिव, मंत्रालय, मुंबई - ३२.
३. मा. उपमुख्यमंत्री (नगर विकास व गृहनिर्माण) यांचे प्रधान सचिव, मंत्रालय, मुंबई - ३२.
४. मा. उपमुख्यमंत्री (राज्य उत्पादन शुल्क, क्रिडा व युवक कल्याण, अल्पसंख्याक व औफाफ), महाराष्ट्र राज्य यांचे सचिव, मंत्रालय, मुंबई- ३२.
५. मा.मंत्री (महसूल) यांचे खाजगी सचिव, मंत्रालय, मुंबई-३२
६. मा.मंत्री (जलसंपदा) यांचे खाजगी सचिव, मंत्रालय, मुंबई-३२
७. मा.मंत्री (अपारंपरिक ऊर्जा) यांचे खाजगी सचिव, मंत्रालय, मुंबई - ३२.
८. सर्व मा. मंत्री यांचे खाजगी सचिव, मंत्रालय, मुंबई - ३२.
९. मा. राज्यमंत्री (ऊर्जा) यांचे खाजगी सचिव, मंत्रालय, मुंबई - ३२.
१०. सर्व मा. राज्यमंत्री यांचे खाजगी सचिव, मंत्रालय, मुंबई - ३२.
११. सर्व विधानसभा/विधान परिषद सदस्य विधानमंडळ सचिवालय, विधानभवन, मुंबई-३२.
१२. मा. मुख्य सचिव, मंत्रालय, मुंबई - ३२.
१३. अपर मुख्य सचिव (जलसंपदा), जलसंपदा विभाग, मंत्रालय, मुंबई - ३२.
१४. अपर मुख्य सचिव (वित्त) मंत्रालय, मुंबई-३२.
१५. अपर मुख्य सचिव (ऊर्जा), उद्योग, ऊर्जा, कामगार व खनिकर्म विभाग, मंत्रालय, मुंबई-३२.
१६. अपर मुख्य सचिव (महसूल), महसूल व वन विभाग, मंत्रालय, मुंबई-३२.
१७. सचिव (नियोजन) मंत्रालय, मुंबई-३२.
१८. अपर मुख्य सचिव/प्रधान सचिव/ सचिव, सर्व मंत्रालयीन विभाग, मंत्रालय, मुंबई-३२.
१९. व्यवस्थापकीय संचालक, महाराष्ट्र राज्य विद्युत मंडळ सुत्रधारी कंपनी, फोर्ट, मुंबई.
२०. अध्यक्ष तथा व्यवस्थापकीय संचालक, महाराष्ट्र राज्य विद्युत वितरण कंपनी, प्रकाशगड, बांद्रा (पूर्व), मुंबई.
२१. अध्यक्ष तथा व्यवस्थापकीय संचालक, महाराष्ट्र राज्य विद्युत पारेषण कंपनी, प्रकाशगंगा, बांद्रा (पूर्व), मुंबई.
२२. अध्यक्ष तथा व्यवस्थापकीय संचालक, महाराष्ट्र राज्य वीज निर्मिती कंपनी, प्रकाशगड, बांद्रा (पूर्व), मुंबई.
२३. महासंचालक, महाराष्ट्र ऊर्जा विकास अभिकरण, पुणे.
२४. सर्व विभागीय आयुक्त.
२५. सर्व जिल्हाधिकारी.
२६. सर्व कार्यकारी अधिकारी, सर्व जिल्हा परिषदा.
२७. मुख्य विद्युत निरीक्षक, मुख्य विद्युत निरीक्षक यांचे कार्यालय, चेंबुर, मुंबई.
२८. सचिव, मा. महाराष्ट्र विद्युत नियामक आयोग, मुंबई.(पत्राने)
२९. महालेखापाल (लेखा व अनुज्ञेयता), महाराष्ट्र-१, मुंबई / महाराष्ट्र-२, नागपूर.
३०. महालेखापाल (लेखापरीक्षा) महाराष्ट्र-१ व २, मुंबई/ नागपूर
३१. ऊर्जा विभागातील सर्व कार्यासने.
३२. निवड नस्ती (ऊर्जा-७), उद्योग, ऊर्जा, कामगार व खनिकर्म विभाग, मंत्रालय, मुंबई-३२.

# परिशिष्ट - “अ”



Industries, Energy, Labour, and Mining Department  
Government of Maharashtra

## Maharashtra Renewable Energy & Energy Storage Policy 2025-26 to 2035-36

Powering Viksit Maharashtra 2047 through Green Energy



March 2026

# Contents

1. Preamble .....	4
2. Vision .....	6
3. Guiding Strategies.....	6
4. Long Term Role of Renewable Energy and Storage .....	8
5. Emphasis on Energy Storage and Hybrid Projects .....	10
5.1. Applicability of InSTS transmission charges and DISCOM demand charges .....	10
5.2. Energy storage co-located with renewable energy (only solar PV & wind) projects..	10
5.3. Stand-alone energy storage projects .....	11
5.4. Distributed energy storage projects.....	12
5.5. Urban and industrial Solar+Storage hubs .....	12
5.6. Bundling of Thermal power stations with RE and or Energy Storage.....	12
6. Enabling Land Availability and Transmission Infrastructure .....	14
6.1. Availability of Government land for RE (wind and solar) and BESS projects .....	14
6.2. Land lease rates for private land for RE (wind and solar) and BESS projects.....	15
6.3. Procedure for use of land for non-agricultural use for RE and BESS projects.....	15
6.4. Renewable Energy (Wind and Solar) Industrial Zones (Parks) (REIZ) .....	15
6.5. Enabling transmission infrastructure and reliable grid operation .....	16
7. Promoting Competition and Consumer Choice .....	20
7.1. Direct RE procurement by small consumers (1-100 kW).....	20
7.2. Direct RE procurement by medium and large consumers (>100 kW) through long term Green OA .....	22
7.3. Facilitative regulatory framework .....	25
8. Ease of Doing Business .....	26
8.1. Further simplification and streamlining of processes .....	26
9. Strengthening Institutions, Promoting Innovation and Piloting New Initiatives .....	26
9.1. Skill building and human resource development.....	26
9.2. Meeting challenges of the energy transition – building data, knowledge and planning expertise .....	27
9.3. Maharashtra R&D, innovation, and start-up centre for renewable energy and energy storage .....	28
9.4. Repowering wind power projects .....	28
9.5. Gearing MSPGCL for the energy transition.....	28
9.6. Restructuring and transforming MEDA for the energy transition .....	29
9.7. Feasibility study for innovative two-part tariff for wind and solar power.....	29

9.8. Harnessing demand-response initiatives for a greener and robust grid.....	30
10. Policy Implementation, Monitoring and Review Structure.....	31
10.1. State-Level Steering Committee.....	31
10.2. Implementation Committee.....	31
Annexure 1: Indicative list of actions, documents, and timelines for different entities .....	33

# 1. Preamble

India has committed to reduce its emissions intensity by 45% by 2030 (compared to 2005 levels) and aims to achieve 50% of cumulative electric power capacity from non-fossil fuel sources by 2030. It also plans on promoting a sustainable way of living through the 'LIFE' (Lifestyle for Environment) movement. All of these goals form part of the updated NDC submitted to the UNFCCC (United Nations Framework Convention on Climate Change) in August 2022. The Government of India has also set an ambitious target of achieving 500 GW generation capacity from non-fossil fuel sources by 2030. These targets contribute to India's long-term goal of reaching net-zero emissions by 2070 and active participation by all the states will go a long way in achieving these targets.

The State of Maharashtra is experiencing rapid growth in industrialization and urbanization, which has led to increase in demand for electricity. Till recently, most of it was being met through conventional sources of energy but there is a rapidly increasing shift towards renewable sources of energy.

To encourage renewable energy, the state government has been formulating policies on renewables energy generation since 1995. With the help of such policies (the most recent ones being the renewable energy policy of 2015 and 2020), the state has reached 31.3 GW of RE by the end of January 2026.<sup>1</sup> Out of this, around 24.3 GW capacity<sup>2</sup> has been commissioned since March 2015 with the support of state RE policies of 2015 and 2020.<sup>3</sup> Similarly, the electricity generation from renewable energy sources has increased from 10.7 BU in FY 2015-16 to 19.6 BU in FY 2024-25.<sup>4</sup> However, in terms of installed capacity (incl. allocated share in joint and central sector utilities) of Utilities, Maharashtra has around 60.6 GW of generation capacity as on January 2026, out of which 50% is from renewable energy sources.<sup>5</sup> The state generated a total of 170 BU electricity in FY 2024-25, out of which around 150 BU electricity comes from conventional sources of electricity and 19.6 BU from renewable sources.<sup>6</sup> By including large hydro, the total electricity generation from renewable energy sources is around 25 BU (15%).

The state met 30.7 GW of peak demand in March 2025<sup>7</sup>, which is also the all-time highest peak demand for the state till March 2025. This is a near 50% increase since March 2015, when the peak demand was around 20.4 GW.<sup>8</sup> Additionally, the state was supplied with 201.8 BU<sup>9</sup> of electricity in the financial year 2024-25, which has increased by 52% from the 133 BU supplied during FY 2014-15.<sup>10</sup> The state's energy demand may increase to 260-270 BU by 2030 considering a growth of 5-6% from 2025-30.

Since 2017, the government has implemented Mukhyamantri Saur Krushi Vahini Yojana (MSKVY), which targets installing solar projects at agricultural feeders to meet agricultural demand during day time. The recently approved MSKVY 2.0 policy<sup>11</sup> targets shifting 100% of agriculture load to day-time by September 2026 and installing around 16 GW solar capacity by March 2027. Realising the importance of energy storage and Green Hydrogen & Green Ammonia for the energy transition, the state government has also issued specific policies in the form of Pumped Storage Policy<sup>12</sup> and Green Hydrogen Policy<sup>13</sup> in 2023.

Added to this, the honourable State Electricity Commission, MERC has recently amended its RPO-REC regulations wherein it has specified RPO target of 43.33% by FY 2029-30 and 4% Energy Storage Obligation (ESO) targets for obligated entities. Further, the Commission has incorporated changes in various regulations related to renewables in the state. This includes formulation of Green OA regulations, changes in Forecasting and Scheduling regulation for solar and wind generation and Grid Interactive RE regulations which deals with solar rooftop projects in the state.

Due to their variable and intermittent nature, increasing share of variable renewable energy sources such as solar and wind poses new challenges for reliable grid operation. In this context, energy storage systems (ESS) can help in reliable grid integration of such RE sources by storing excess energy for use during low RE hours.

Building on these policies and regulations and considering the need for rapid renewable energy and energy storage growth in the state over the next 10 years, the Energy Department, GoM has framed this policy for grid-connected Renewable Energy and grid-connected Energy Storage development in the State.

## 2. Vision

The Renewable Energy & Energy Storage Policy 2025-26 To 2035-36 aims to significantly increase the generation and consumption of low cost, eco-friendly grid-connected renewable energy and energy storage in Maharashtra's electricity sector over the next decade. This will improve affordability, energy security, competition, and consumer choice.

## 3. Guiding Strategies

This vision shall be realised through focused efforts on six strategies:

1. **Ambitious and long term renewable energy targets**
2. **Focus on hybrid projects and energy storage**
3. **Enabling transmission infrastructure and land availability**
4. **Promoting competition and consumer choice**
5. **Incentives and ease of doing business**
6. **Strengthening institutions, promoting innovation and piloting new initiatives**

This document provides broad policy guidance to implement these strategies. This policy is in addition to and will supplement other green energy-related policies such as the Green Hydrogen Policy 2023, the Pumped Storage Policy 2023, the Small Hydro Projects Policy, 2024<sup>14</sup>, the Electric Vehicles Policy 2025<sup>15</sup>, and Mukhyamantri Saur Krushi Vahini Yojana (MSKVY) 2.0.

### Overarching provisions for effective implementation of the policy

- a. **Periodic review:** Considering the dynamic and complex nature of the emerging energy sector which is poised to confront a multitude of challenges, this policy will be reviewed and modified from time to time by the Govt. of Maharashtra to complement the vision and guiding strategies elaborated in this policy document. These challenges necessitate innovative solutions, and it is imperative that policy responds in a timely manner to effectively address them.
- b. **Supplementary documents:** Specific procedures, guidelines, methodologies circulars etc. as needed to implement and operationalise provisions of the policy will be issued by appropriate agencies in a timely manner and would also play an important and integral part of implementing these strategies. A detailed indicative list of all such documents is listed in Annexure 1. These may be supplemented by additional clarifications as may be needed from time to time about the contents of this policy or in the implementation of this policy. The explanation given by the Department of Energy, GoM will be final and binding on all concerned.
- c. **MERC and regulatory framework:** While formulating its regulations and orders, the Honourable MERC shall be guided by the approach detailed in this policy and shall undertake appropriate steps to facilitate the implementation of this policy and achieving targets set in this policy.
- d. **Policy period:** This policy will be effective from the day of its publication as Government Resolution to 31st March, 2036. The previous Govt. of Maharashtra RE policy of 2020 is superseded by this policy except as provided in para 3(f) of this Policy. However, projects already under construction or operational under the 2015 and 2020 RE policy will be governed by those policies.
- e. **Applicability of the policy:** This policy is applicable for grid-connected Renewable Energy and grid-connected Energy Storage projects. "Renewable Energy Sources" means the renewable sources such as wind, solar, large hydro, mini hydro, micro hydro, small hydro, biomass including bagasse, bio fuel cogeneration, urban

or municipal solid waste, Hybrid RE based on RE technologies and such other sources as are recognized or approved by MNRE and MERC. As of 2019<sup>16</sup>, GoI has declared large hydro power as renewable energy. The policy aims to give long term guidance for the renewable energy sector and its associated stakeholders. This policy will be implemented literally and in principle by Government of Maharashtra. However, failure to implement any part of this policy shall not be construed as “change of law” for the purposes of legal agreement between the parties.

**f. Following policies and GRs as listed below as amended from time to time will remain in effect.**

1. For distributed off-grid renewable energy like off-grid solar agricultural pumps, solar street lights, rooftop off grid / hybrid solar power plants, solar water heaters, solar steam cooking system, decentralized micro grid projects, rural electrification, solar cold storage, solar dryers etc., part B of the existing 2020 RE policy as amended from time to time will remain in effect.
2. GR dated 8<sup>th</sup> May, 2023 - [MUKHYAMANTRI SAUR KRUSHI VAHINI YOJANA-2.0. Campaign to provide uninterrupted and sustainable electricity supply to farmers agricultural pumps during day time.](#)

## 4. Long Term Role of Renewable Energy and Storage

Considering the rapidly growing demand in the state and taking advantage of the fixed low-cost tariffs of renewable energy and energy storage, the State is already on the firm path towards achieving 50% of its electricity demand from renewable energy sources by FY 2029-30.

Building on this solid foundation and based on the evolution of the techno-economics of the RE and ESS sectors, electricity markets, transmission and regulatory frameworks, the State will strive towards procuring 65% renewable energy as a share of electricity demand by FY 2035-36. The largest contribution to these RE targets is likely to come from solar and wind energy sources. Electricity demand in the state is expected to grow from 202 BU in FY 2024-25 to around 350-360 BU by FY 2035-36. Given this ambitious target, the entire increase in demand in the coming decade of FY 2025-26 to FY 2035-36 shall be met through additional renewable energy procurement.

However, given the variable and intermittent nature of renewable energy, energy storage systems (ESS) will become increasingly critical for reliable integration of such renewable energy systems in the grid. This would be essential to ensure grid stability, reliability, and optimal energy utilization. As per the National Electricity Plan published by the Central Electricity Authority, to integrate the 364 GW of solar and 121 GW of wind capacity by 2031-32, India would require 73.93 GW/411.4 GWh of storage capacity (26.69 GW/175.18 GWh from PSP and 47.24 GW/236.22 GWh from BESS).

As such, to ensure system reliability with high shares of RE, electricity distribution companies in the state shall procure energy storage capacity equivalent to at least 10% of their demand by FY 2035-36. This obligation shall be treated as fulfilled only when at least 85% of the total energy stored is procured from renewable energy sources on an annual basis. The renewable energy used for charging ESS shall be considered as part of RPO.

*The State will strive towards procuring 65% renewable energy as a share of electricity demand by FY 2035-36 and electricity distribution companies in the state shall procure energy storage capacity equivalent to at least 10% of their demand by FY 2035-36.*

For the purposes of the above targets, "Renewable Energy Sources" means the renewable sources such as wind, solar, large hydro, mini hydro, micro hydro, small hydro, biomass including bagasse, bio fuel cogeneration, urban or municipal solid waste, Hybrid RE based on RE technologies and such other sources as are recognized or approved by MNRE and MERC. Similarly, Energy Storage System or "ESS" in relation to the electrical system, means a facility where electrical energy is converted into any form of energy which can be stored, and subsequently reconverted into electrical energy and injected back into the grid. ESS technologies include Pumped Hydro Storage (PSP) or Battery Energy Storage Systems (BESS) and any other storage technologies as are recognized or approved by MNRE and MERC from time to time.

Considering estimated demand of 350 BU by FY 2035-36, the generation needed from RE would need to be around 228 BU by FY 2035-36. The equivalent RE capacity needed for meeting these targets would be around 100 GW considering an average CUF of 26%. Similarly, the generation needed from energy storage would be around 35 BU/year by FY 2035-36. The equivalent storage capacity needed for meeting this target would be around 100 GWh/day by FY 2035-36 (20 GW assuming an average 5 hours duration).

*The equivalent RE capacity needed for meeting the 65% target would be around 100 GW. Similarly, the equivalent storage capacity needed for meeting the 10% ESO target would be around 100 GWh/day by FY 2035-36.*

The Government of Maharashtra notified the 'Policy for Development of Pumped Storage Projects (PSPs),' on 20th December 2023. As per this policy, electricity distribution licensees shall retain the Right of First Refusal (RoFR) for all energy and benefits offered by such projects. It is clarified that electricity distribution licensees in the state are not obligated to procure power or provide pumping energy to PSPs, however, the concerned DISCOM must communicate its decision to exercise the RoFR within 30 days of receiving formal communication from the project developer. In the event that no decision is communicated within the stipulated period of 30 days, the same shall be deemed to constitute refusal by the Distribution Licensee. PSP developers shall utilize / sale PSP power as per their chosen arrangement once state utilities exercise their RoFR.

## 5. Emphasis on Energy Storage and Hybrid Projects

Several power sector modelling studies have explored scenarios of high renewable energy. They broadly conclude that a combination of low-cost renewable energy (especially solar + wind) coupled with energy storage (BESS+/PSP) and demand-side flexibility can meet demand in a cost-effective and reliable manner. Thus, the role of energy storage becomes crucial in the coming years. With the share of renewables rapidly expected to increase over the years, the policy strongly emphasizes the need for adequate capacity of energy storage to help reliably integrate such renewable energy. Energy storage could be co-located with renewable energy projects or it could be built as a stand-alone project as well. Both approaches will be allowed and promoted under this policy.

The minimum connectivity threshold for ESS seeking connectivity to the InSTS network shall be 5 MW. A standalone ESS shall apply for grant of connectivity for a quantum of its proposed maximum injection to InSTS or proposed maximum drawl from InSTS, whichever is higher.

### 5.1. Applicability of InSTS transmission charges and DISCOM demand charges

Energy storage is a uniquely flexible resource, capable of acting as a generator when discharging, a load when charging, and a grid support asset by providing ancillary services. Hence it needs to be defined as a unique asset class within the regulatory framework. *Rule 18 of the Electricity (Amendment) Rules, 2022, dated 29th December, 2022, specifies that Energy Storage System (ESS) is part of the power system, as defined under clause (50) of section 2 of the Act and provides further clarification about the legal status and operation of various ESS ownership and operation models.* The relevant MERC regulations shall be modified for providing clarity about status and operation of ESS. Necessary procedures for connectivity and operational purposes shall be prepared by STU, SLDC and related entities as per these regulations.

ESS shall be granted InSTS connectivity as permitted under the MERC Transmission Open Access Regulations, as amended from time to time. Such ESS may also draw power through InSTS for its charging. ESS may also request connectivity to the distribution network (33 kV or 11 kV), provided that such ESS shall not be permitted to send/transmit power outside Maharashtra.

The ESS, connected either to InSTS or the distribution network (33 kV or 11 kV) when drawing power for intermediate storage purpose; shall not be levied transmission charges; or distribution demand and wheeling charges, electricity duty and cross subsidy surcharge, provided that the stored energy is consumed within the state of Maharashtra. However, consumers consuming electricity from such ESS shall continue to pay applicable tariff for such consumer category.

The scheduling of ESS shall be as per the relevant Grid code, regulations and procedures thereof as amended from time to time. The drawl and injection schedules of the ESS will be subject to the MERC DSM regulation and applicable charges thereof as amended from time to time.

### 5.2. Energy storage co-located with renewable energy (only solar PV & wind) projects

One route to reduce the variability and intermittency of single source RE projects is to have hybrid projects. Hybrid projects are generally of three types, (a) combining one source of RE (wind/solar) with energy storage, (b) combining two sources of RE (wind and solar) together and, (c) combining two sources of RE together with energy storage. Several CPSUs and Renewable Energy Implementing Agencies (REIAs) such as SECI, NTPC, NHPC and SJVN have been coming out with tenders for such hybrid projects with varying levels of energy storage and different availability and capacity utilisation factors. These include wind-solar hybrids, solar+BESS, RE-RTC and FDRE (peak and load following) etc. Such projects will deliver far greater value to the State in terms of better alignment to State's load profile, higher CUFs (depending on level of storage), further optimisation of transmission costs from higher utilisation and meeting Maharashtra's share in the national coincident peak demand. This policy will actively promote such projects as detailed below.