

# **Agricultural Consumption Analysis Study**

## **Proposed Sampling Methodology and Field Survey Approach**

**Date: 6 May 2019**

1. Mid-Term Review (MTR) Order for MSEDCL was issued on 12 September 2018 in Case No. 195 of 2017. In the said Order, as regards assessment of Agricultural sales the Commission has ruled as under:

*“In the previous MYT order, the Commission had disallowed 2,414 MUs of AG sales in FY 2014-15 and 3,400 MUs of AG sales in FY 2015-16. In the MTR Petition, MSEDCL has requested the Commission to approve the AG sales for FY 2014-15 and FY 2015-16 without any disallowances. In the review order Case No. 176 of 2016, the Commission had decided to revisit the disallowances in the MTR Petition on the basis of statement by MSEDCL that the Committee report is expected by March, 2017. However, the Commission notes that MSEDCL has not yet submitted the report as elaborated earlier in this section. **Hence, the Commission now shall conduct an independent study through an agency for assessment of Ag sales, which shall form the basis of establishment of Ag sales from FY 2014-15 and in subsequent years. The Commission shall appoint an independent 3rd party agency to undertake such study. Further the Commission shall define a detail ToR in due course of time and would be published on website.**”... (Emphasis Added)”*

2. Subsequently, the Commission had accorded approval for constitution of a Working Group (WG) for Agricultural Consumption study (AG study). Objectives of the WG, Members of the WG, and their respective Terms of Reference were published by MERC vide notification dated 2 November 2018 and was uploaded on the Commission’s website.
3. In order to meet the objective of the WG and for successfully carrying out Agricultural consumption study, a detailed survey has to be carried out. As per MSEDCL submission, there are around 41.54 Lakh AG consumer connections (out which, metered - 26.50 Lakh and un-metered-15.04 lakh) with connected load of 210.84 Lakh HP (out which, metered – 133.44 Lakh HP and un-metered-75.40lakh HP) as on Mar 2018. Sampling methodology and selected sample size should be representative enough to represent such vast/diverse universe of data and an appropriate sampling method need to be arrived at for conducting the survey. Accordingly, in WG meetings a detail sampling methodology was discussed and deliberated. The same is published vide this notice, for the public at large

to provide their comments and suggestions on the suggested methodology. This would enable to finalize such sampling methodology with due changes, if any, based on the suggestion received, before the Commission proceeds to carry out the full-fledged survey as part of the AG consumption study.

4. **Proposed feeder sampling methodology:** The objective of the study is to estimate electricity used for agriculture in Maharashtra. As reasonably reliable feeder input data (based on AMR / MRI) is available, it is proposed to use feeder as a basic unit of analysis. Considering availability and capability of survey agencies, time required for survey, costs and other such practical, on filed considerations, and need to select representative sample, WG decided to undertake field survey of 500 AG feeders spread across the state. Electricity use on a representative sample of 500 feeders will be estimated using a combination of AMR/MRI data and a survey of farmers drawing electricity from those feeders. A stratified random sampling approach is proposed for selecting the representative sample of feeders. The sampling frame consists of 10,260 agricultural feeders in Maharashtra, which cover about 95 % agricultural consumers. MSEDCL would provide details on number of agricultural consumers, connected load, and annual sales (electricity consumption) and other required parameters for all these feeders. Feeder wise annual sales have been considered as the primary criterion for stratification. The feeders are ranked according to their total annual sales and then divided into four groups of equal sizes. Each quartile has about 2600 feeders. It is observed that each quartile exhibits a fairly wide geographical distribution. The sample is then distributed across each quartile based on a weight which was estimated considering the total number of consumers, the connected agricultural load, and the total agricultural sales in each quartile. Within each quartile, the sample is further distributed across the four different feeder types (LT Mix, LT AGD, LT SPP, and LT SDT) based on a weight calculated in a similar fashion as above. A random sample is then chosen from these 16 strata (four feeder types in each quartile). This sampling methodology would result in agricultural electricity consumption estimated on these feeders being representative of the Maharashtra state as a whole. As such, this method would enable state-wide estimation of AG sales. Data collected through survey and Feeder meter data along with other parameters as may be required would be analyzed to arrive at feeder level Agricultural consumption index. The results can then be extrapolated to estimate the total annual agricultural electricity consumption in Maharashtra along with other analysis and factors.
5. **Survey approach:** A questionnaire has been developed for collecting field data (Annexure 1). Survey and field collection of data will be carried out through independent survey agencies to be appointed by the Commission. WG will periodically review work of survey agencies and data collection. Data collection will be through an Mobile App

(mobile based application) to be installed on a mobile device. The app / mobile device will enable instant capturing of field data and also logging of GPS coordinates (lat-log) and relevant site photographs. This will enhance timeliness and accuracy of data collection. A test survey was carried out to test the questionnaire and Mobile App and these have been modified based on test survey. Based on actual survey experience, sampling methodology, questionnaire and app may be modified during the course of survey if any critical changes are required for the purpose of the study.

6. The Commission invites written comments and suggestions on the proposed sampling methodology and survey approach/questionnaire (if any) as detailed out in this notification. These may be sent to the Secretary, MERC, 13th floor, Centre No.1, World Trade Centre, Cuffe Parade, Mumbai – 400 005 personally or by post; or by Fax, or by E-mail [Fax No. 022-22163976, E-mail: mercindia@merc.gov.in].
7. All comments and suggestions received on or before 28 May, 2019 shall be considered by the working group before finalizing the sampling methodology and field survey.

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### **Annexure 1 : Survey Questionnaire**