Chapter-II

Project Formulation and Execution

2.1 As referred in **paragraph 1.4**, the projects have been planned and executed to cover the following components of the DDUGJY scheme:

- **Separation of agriculture and non-agriculture feeders**: Feeder separation refers to supply of electricity to agriculture and non-agriculture consumers separately through dedicated feeders to facilitate judicious rostering of supply to agriculture and non-agriculture consumers in the rural areas;
- **Strengthening and augmentation of sub-transmission & distribution infrastructure** including metering at Distribution Transformers, feeders and consumers end in rural areas to ensure reliable and quality of power supply in rural areas and to facilitate a mechanism for proper energy accounting.
- **Rural electrification for completion of the targets laid down under RGGVY for 12th and 13th plan.**

Project Formulation

2.2 Project formulation under the scheme was to be done in two stages. In Stage-I need for feeder separation and critical gaps in sub-transmission and distribution network, considering all relevant parameters[8] and on-going works under other schemes, was to be identified for efficient management of distribution system. In Stage-II district/ circle/zone wise Detailed Project Reports (DPRs) were to be formulated on the basis of broad scope of work validated by REC at 1st Stage, detailed field survey and latest approved schedule of rates for various items of work. The utilities were also necessarily required to consult the public representatives including Member of Parliament while formulating DPRs and to furnish a certificate to this effect while submitting DPRs to REC.

Preparation of Need Assessment Document

2.3 Pursuant to DDUGJY guidelines, the DISCOMs were required to prepare a Need Assessment Document (NAD), in the prescribed format (circulated by REC), containing all relevant information along with justifications (preferably by way of load flow studies) to substantiate the proposed scope of work and cost estimates. The NAD was to consist of general details of project area, power supply, on-going schemes, consumers, households, villages, details of existing Infrastructure (substations, feeders, distribution transformers, LT line, meters *etc.*) along with details of proposed infrastructure (new substations, augmentation of feeders, DTs, LT line, capacitor banks, meters *etc.*). The NAD was required to be examined by REC

8 Consumer mix, consumption pattern, voltage regulation, AT&C loss level, HT & LT ratio, optimum loading of transformers & feeders / lines, reactive power management, power factor improvement, standard of performance *etc.*

to arrive at broad scope of work to be covered under the scheme and the total cost in consultation with the concerned DISCOM.

Audit observed that none of the three DISCOMs had prepared NAD for identifying the need for feeder separation and critical gaps in sub-transmission and distribution network based on which the scope of work was to be decided. In the absence of NAD, wide variations in the quantity/work envisaged/ executed were noticed as highlighted in **paragraph 2.11**.

The Government accepted the facts and stated that the NAD was not prepared due to time and fund constraints. It further stated that the works envisaged in the scheme are also carried out under the past schemes and were regularly monitored. Further, load flow study was not conducted in view of DISCOMs' dynamic data and availability of practical data used for designing of sub-stations and lines.

The reply is not convincing as NAD was to be prepared as per the scheme guidelines which could have helped in identifying the need for feeder separation and critical gaps in sub-transmission and distribution network. Further, DISCOMs never raised the issue with the REC/MoP to provide separate fund for preparation of NAD.

Formulation of Detailed Projects Reports

2.4 Detailed Project Reports (DPRs) were required to be formulated on the basis of broad scope of work validated by REC at 1st Stage, detailed field survey and latest approved schedule of rates for various items of work.

Audit noticed that Ajmer DISCOM prepared DPRs departmentally whereas Jaipur and Jodhpur DISCOMs appointed (March 2015) WAPCOS Limited for formulation of DPRs. The work orders issued *inter alia* included:

- study, field survey with GPS as per MoP guidelines;
- proposals for physical separation of HT feeders for agricultural and non-agricultural consumers;
- new DTs and augmentation/addition of existing DTs;
- re-location of DTs and associated LT lines;
- erection of HT lines for drawing new feeders;
- proposal and study of the 33 KV and 11 KV system and bifurcation and augmentation of existing overloaded 33 KV and 11 KV feeders;
- creation of new sub stations and augmentation of existing overloaded sub stations; and
- proposal for metering at sub-stations, feeders and consumers for energy accounting and audit.

Scrutiny of DPRs prepared by DISCOMs disclosed the following shortcomings:

- **Jaipur and Jodhpur DISCOM:** To assess quantum of works, as mentioned in work order, a detailed field survey was required to be done by WAPCOS in consultation with the authorised Engineers of both the DISCOMs and the same was to be approved by the concerned Superintending Engineer, Operation & Maintenance (SE, O&M) of

DISCOMs. However, nothing was found on records about carrying out field survey by WAPCOS and its approval by the concerned SE (O&M) circle of DISCOMs.

- Similarly, in **Ajmer DISCOM**, no information of carrying out detailed survey by the concerned O&M circles before formulation of DPRs was found on records.

The Government stated that DPRs were prepared after detailed joint survey with consultant and concerned field officers. DPRs were approved by the circle SE (O&M).

The reply was not acceptable as the DISCOMs failed to provide the project wise detailed survey reports.

Approval of Projects

2.5 The SLSC approved (July 2015) DPRs of 33 projects of the three DISCOMs for electrifying un-electrified rural households; separation of agricultural and non-agricultural consumers feeders; strengthening of distribution network amounting to ₹ 3,557.32 crore[9] under DDUGJY for onward submission to the MC of MoP, GoI through REC. However, DPRs of 33 projects worth ₹ 3,241.05 crore[10] only were uploaded on the DDUGJY web portal of REC, for which no justification was found on records. As against demand of ₹ 3,241.05 crore, REC conveyed (August 2015) approval of the MC for ₹ 2,819.41 crore[11] including Project Management Agency (PMA) charges of ₹ 14.03 crore. Further, REC asked (September 2015) the State Government to submit the Supplementary DPRs (recast based on approved parameters) on online web portal within component wise and project wise sanctioned cost.

Audit observed that the Supplementary DPRs (₹ 2,805.38 crore excluding PMA charges), prepared by the DISCOMs were not placed before the SLSC for its approval before uploading on the web portal. Further, the date on which the Supplementary DPRs were uploaded, was not found on records of the DISCOMs.

The Government stated that SLSC approved the original proposals and hence, subsequent modifications were not submitted before it, to ensure time bound uploading of recast DPRs. It further stated that the DISCOMs have to honour the time limits to avoid the cost escalation and therefore, deviations/ modifications in the DPRs shall be got approved from SLSC at the time of the closure of the projects. Moreover, in time bound project implementation, the formal approval of the statutory committee is generally obtained at the final stage.

The reply was not convincing as the SLSC which was constituted for recommending the DPRs for approval to MC and to ensure non-duplication/ overlapping in project works, was not apprised/involved in the changes/ modifications/curtailments incorporated while preparing supplementary DPRs.

9 Jaipur DISCOM- ₹ 1,043.36 crore, Ajmer DISCOM- ₹ 955.02 crore, Jodhpur DISCOM- ₹ 1,558.94 crore.

10 Jaipur DISCOM- ₹ 1,158.62 crore, Ajmer DISCOM- ₹ 955.01 crore, Jodhpur DISCOM- ₹ 1,127.42 crore.

11 Jaipur DISCOM- ₹ 1,032.22 crore, Ajmer DISCOM- ₹ 833.50 crore, Jodhpur DISCOM- ₹ 953.69 crore.

The justification for bypassing the SLSC was also not acceptable as by not involving SLSC in supplementary DPRs, the very purpose of its constitution was defeated. Further, as the date on which supplementary DPRs were updated was not available, the government's claim on the time bound uploading of recast DPRs could not be verified in Audit.

National Optical Fibre Network

2.6 DDUGJY envisaged to connect all the 33 KV or 66 KV grid sub stations/billing offices/Regional/Circle/Zonal offices of DISCOMs by extending optic fibre network being established under National Optical Fibre Network (NOFN). Further, a provision of 100 *per cent* grant was made under DDUGJY for connecting the missing links of NOFN including terminal equipment, provided such connectivity was not included/ approved under any other scheme of GoI/State Government.

DISCOMs were required to prepare separate and consolidated DPR in consultation with Bharat Broadband Network Limited or any designated agency like BSNL, RailTel, PGCIL *etc*. for the NOFN programme in the State. Further, the proposed implementation methodology and milestones along with the cost was to be included in DPRs and after recommendation of SLSC, DPRs were to be submitted to REC.

Audit noticed that none of the 33 KV or 66 KV grid sub stations/billing offices/ Regional/Circle/Zonal offices of DISCOMs were connected with optical fibre network. However, DISCOMs did not prepare DPRs for optic fibre network under NOFN for which no reason was found on records. Thus, due to not taking initiative despite having provision under DDUGJY, DISCOMs were deprived of getting connected their GSS/Billing offices and other premises with optical fibre network.

The Government stated that priority was given to rural system strengthening than development of NOFN. It further stated that inclusion of NOFN might have further reduced the availability of funds for other works.

The reply was not acceptable as DDUGJY guidelines envisaged formulation of DPRs for NOFN and had separate provision for 100 *per cent* grant for implementing NOFN. Thus, the DISCOMs lost the opportunity to implement NOFN by availing cent *per cent* grant from the GoI.

Project Execution

Delay in implementation of scheme

2.7 The district/circle/zone wise DPRs were to be prepared by the DISCOMs and after being recommended by State Level Standing Committee (SLSC), DPRs were to be submitted to REC online through web portal. One hard copy of each DPR (as printed out from web portal), was also to be submitted to REC for record and reference. After approval of the Monitoring Committee (MC), turnkey projects and partial turnkey/ departmental basis projects were to be completed within a period of 24 months and 30 months respectively from the date of issue of Letter of Award (LoA) by the DISCOMs.

Delay in award of projects

2.8 As per the DDUGJY guidelines, the projects were to be awarded within six months of date of communication of the approval by the MC. The details of submission of DPRs to SLSC, its approval, online submission to REC, approval of MC, date of issue of LoA and progress of completion of the projects is given in the **Annexure-2.**

Audit noticed that Jaipur, Ajmer and Jodhpur DISCOM took significant time, beyond six months from approval of MC, in issuing LoA to the contractors which was ranged between 164 to 276 days, 276 to 331 days and 185 to 352 days respectively. Audit observed that the reasons attributable to delay in issue of LoA were non-finalisation of Standard Bidding Document (SBD); initial decision to procure high value items[12] for supply to the contractors which was later reversed; delay in finalisation of specification; poor response from bidders *etc*. due to which the bid opening dates were extended several times. Besides, none of the projects were completed within the stipulated time period. MoP, GoI *suo-moto* extended (August 2019 and July 2020) the timeline for completion of the projects to March 2020 and then upto March 2021 respectively.

The Government accepted the facts and stated that the delay in award of projects was genuine in view of delays in finalisation of bidding documents and mode of tendering, renegotiations with bidders as per directions of BoD of the DISCOMs.

Delay in execution of the projects

2.9 As per the provision of the Scheme and the terms and conditions stipulated in LoA, the contractors were required to complete the works awarded to them within a period of 24 months from the date of issue of LoA. Further, as per the terms and conditions stipulated in the work orders, the contractors were required to conduct a detailed GPS based survey with authorised engineer of the DISCOMs to assess actual quantum of the work. They also had to prepare a

12 Power transformers, Distribution Transformers, AB Cables, Conductors, Meters and Underground cables.

single line diagram on AutoCAD with GPS coordinates on political map with fair correctness within a period of two months from the date of issue of LoA.

Audit observed that none of the 33 projects awarded under the Scheme were completed within the originally stipulated time period and there was considerable delay ranging between 367 days to 857 days, 697 days to 752 days and 19 days to 604 days in Jaipur, Ajmer and Jodhpur DISCOM respectively. Scrutiny of records disclosed that the projects could not be completed within the stipulated time due to following reasons:

- delay in furnishing of survey reports by the contractors,
- delay in conveying approval of surveyed bill of quantity (BOQ) by the competent authorities of the DISCOMs,
- change in place/site of Grid Substation (GSS) and specifications of Plain Cement Concrete (PCC) poles,
- change in priority to release pending rural connections by March 2018 under "Power to All" over DDUGJY works, and
- awarding the work under 'Saubhagya' Scheme to the same contractor also slowed down implementation of the DDUGJY projects.

In selected projects of all the three DISCOMs, Audit noticed that the concerned contractor instead of completing the entire survey work in one go with the authorised engineer, carried out the survey in piece-meal *i.e.* block wise and commenced the work in that block after approval of the competent authority. Audit observed that because of adoption of this method, the DISCOMs authorities were not in a position to assess the actual quantum of work/BOQ and there was huge variation **(as depicted in Table 2.1)** in the work assessed in DPRs and work executed in the field. Further, this has also caused significant delay in execution of work because on each occasion, the contractor commenced the work only after approval of the competent authority.

The Government accepted the fact of not carrying out the entire survey in one go and stated that the block-wise survey was need of the contemporary situation to avoid public unrest. It further accepted that block-wise survey attributed to the delay but the same was not significant as compared to ease of execution with minimum public hindrances. On the issue of delay in completion, the Government stated that all the project works were completed within the time frame allocated by REC.

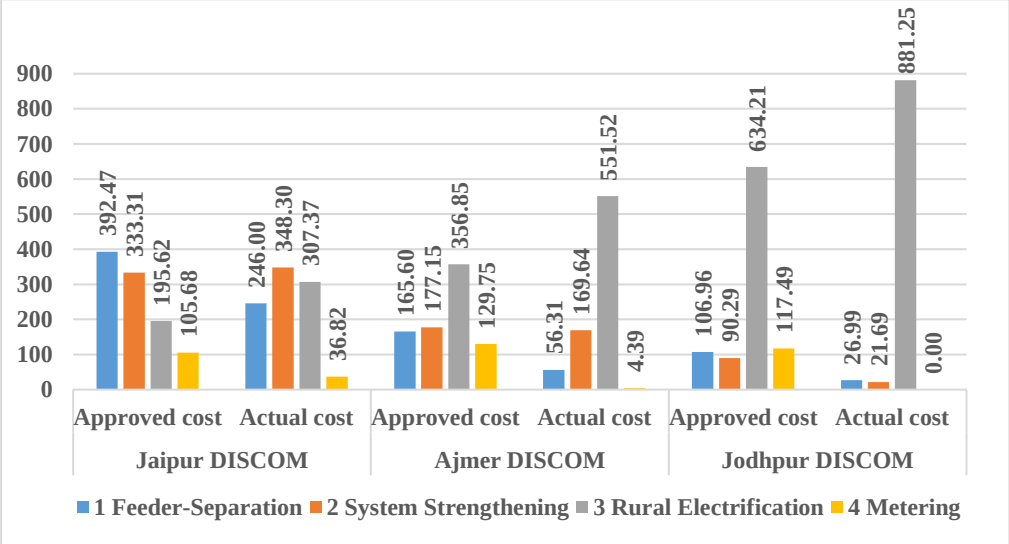
The reply was not convincing as none of the project work could be completed within the originally stipulated timeframe and the extension for the scheme was caused by delay in execution of projects. Further, block-wise surveys also led to improper assessment of the actual quantum of work/ BOQ and caused inordinate delay in execution of projects.

Component wise approved cost of projects vis-à-vis actual cost

2.10 The component wise approved cost of projects and actual expenditure incurred by DISCOMs on each component upto 31 December 2020[13] is given in the chart below:

Chart No. 2.1
Status of component wise approved cost and actual cost

(₹ in crore)



Note: Actual cost figures are provisional as on 31 December 2020

It could be seen from the chart above that DISCOMs incurred more expenditure on rural electrification works by curtailing the works related to feeder separation, system strengthening, metering *etc.* envisaged and approved under DDUGJY.

The DISCOMs incurred ₹ 329.30 crore, ₹ 539.63 crore, ₹ 1,740.14 crore and ₹ 41.21 crore as against the cost approved for Feeder Separation (₹ 665.04 crore), System Strengthening (₹ 600.76 crore), Rural Electrification (₹ 1,186.69 crore) and Metering (₹ 352.92 crore) respectively. This indicated that the DISCOMs mainly focused on rural electrification by curtailing the funds allocated for other three components.

Physical Targets and Achievements

2.11 Under the Scheme, physical achievements broadly relate to feeder separation (both physically and virtually); strengthening the sub-transmission and distribution system; micro-grid and off-grid distribution network and metering at sub-stations, feeders, distribution transformers and at consumer's premises (for un-metered connections, replacement of faulty meters & electro-mechanical meters). Besides, completion of Rural electrification, as per the targets laid down under RGGVY for 12th and 13th Plans was also to be done by subsuming RGGVY in DDUGJY.

DISCOM-wise details of physical works sanctioned/ awarded *vis-à-vis* actually completed upto 31 March 2021 is given in **Annexure-3.**

13 Component-wise break-up of actual cost is not available with DISCOMs after December 2020.

There was huge variation in the quantum of various works undertaken for feeder segregation and system strengthening as shown in the table below:

Table No. 2.1
Details of quantity sanctioned/ awarded and actually completed upto 31 March 2021

S. No.	Particulars	Unit	Quantity sanctioned and awarded	Actual completed quantity upto March 2021	Percentage
1.	Feeder Segregation (Except S. No. 6)	Nos.	2551	1498	59
2.	New Substations of 33/11 KV	Nos.	208	230	111
3.	Augmentation of 33/11 KV Substations	Nos.	5	80	1600
4.	Distribution Transformers	Nos.	39084	75093	192
5.	LT Line	CKM [14]	22683.00	44279.80	195
6.	11 KV Line	CKM	21414.43	19755.44	92
7.	33 & 66 KV Line	CKM	1930.70	1751.92	91
8.	Energy Meter–Consumer (a+b)	Nos.	961827	589838	61
a	New Connection		523062	589838	113
b	Replacement of defective meter		438765	0	0
9.	Energy Meter - 11 KV Feeder	Nos.	8562	2182	26

Source: DPRs and information provided by DISCOMs.

- There were 7,22,360 un-electrified Rural Households (RHHs) at the inception of DDUGJY. DISCOM-wise detail of un-electrified RHHs is given in **Table 2.3**. For providing connections to these un-electrified RHHs, a provision of only 5,23,062 Energy meters and 39,084 Distribution Transformers (DTs) were envisaged in the DPRs against which 75,093 DTs were installed upto 31 March 2021 for releasing electricity connections to 5,89,838 RHHs.
- Installation of DTs for system strengthening and new connections was envisaged in DPRs but no provision was made for meters to be installed on new DTs and for replacement of defective meters installed on DTs.
- DPRs of all the 33 districts/projects included 41,765 villages/habitations to be electrified under the scheme. However, 16,765 villages/habitations (22 districts/projects) and 2,327 villages/habitations (17 districts/ projects) shown as un-electrified were found already electrified and were not in existence respectively while carrying out site survey by the turnkey contractors before start of the execution of the work as depicted in the table below:

Table No. 2.2
DISCOM wise status of villages/habitations proposed for electrification

(Figures in number)

DISCOM	Villages/ habitations proposed for electrification		Villages/ habitations which were found already electrified during site survey		Village/ habitations which were not in existence during site survey	
	Districts projects	Villages/ habitations	Districts projects	Villages/ habitations	Districts projects	Villages/ habitations
Jaipur	12	9026	9	7624*	9	1705
Ajmer	11	13266	4	1153	2	115
Jodhpur	10	19473	9	7988	6	507
Total	**33**	**41765**	**22**	**16765**	**17**	**2327**

Source: DPRs and information provided by DISCOMs.

*** Jaipur DISCOM informed that this figure pertains to ground survey conducted by the contractor and included some habitations/villages not included in the DPR.**

14 Circuit Kilometer.

Against requirement of 14,59,173 Energy meters[15] for providing new connections and replacement of defective meters, DISCOMs kept provision of 9,61,827 Energy meters in DPRs as depicted in the table below:

Table No. 2.3
DISCOM wise requirement vis-à-vis provision of Energy meters kept in DPRs

(Figures in number)

DISCOM	Energy meters required at the inception of DDUGJY			Energy meters provided for in the DPRs		
	For release of new connections to RHHs	For replacement of existing defective meters	Total	For release of new connections to RHHs	For replacement of existing defective meters	Total
Jaipur	152888	145513	298401	160476	129589	290065
Ajmer	213884	382290	597074	87879	309176	397055
Jodhpur	355588	208110	563698	274707	0	274707
Total	**722360**	**735913**	**1459173**	**523062**	**438765**	**961827**

Source: DPRs and information provided by DISCOMs.

DISCOMs could not meet even the targeted (which was lower than the requirement) installation of Energy meters as they could install only 5,89,838 Energy meters[16] under DDUGJY. Non-achievement of targeted installation was due to non-replacement of defective meters under DDUGJY.

Thus, in the absence of detailed field survey before formulating Projects DPRs there was huge variation in the envisaged/approved quantities of works executed under DDUGJY. This also reflects that DPRs were not formulated on realistic data and hence the Bills of Quantity (BOQ) of the works executed had to be modified time and again. The shortcomings noticed in execution of works are discussed in **paragraphs 2.12 to 2.15.**

The Government stated that DPRs were prepared after detailed survey and the variations in the quantity in feeder segregation and system improvement activity were caused by change in the site conditions due to lapse of time, prioritising release of household connections under other schemes, execution of works through Central Labour Rate Contract (CLRC) and limitation of funds.

The reply was not satisfactory as detailed field survey reports were not found in records. Further, inclusion of villages/ habitations which had already been electrified or did not exist in DPRs indicated that the survey was not carried out properly. Besides, the time gap did not justify the significant variations (ranged between 26 *per cent* and 195 *per cent*[17]) in the quantities and the same could have been avoided by conducting a detailed survey at planning stage and involving the plan wings while preparing the DPRs.

Component-wise analysis of the work executed has been discussed in the subsequent **paragraphs 2.12 to 2.15**.

15 Energy meter (*i.e.* meter installed at the consumer's end) is a device that measures the amount of electrical energy consumed.
16 All the energy meters used for release of new connections to rural households.
17 Except 1600 *per cent* variation in case of augmentation of 33/11 KV Substations.

Separation of agriculture and non-agriculture feeders

2.12 The work of separation of agriculture and non-agriculture feeders was envisaged for facilitating judicious rostering of supply to agricultural & non-agricultural consumers in the rural areas. Accordingly, the DISCOMs were required to identify the need of feeder separation. Further on the proposal of the DISCOMs to include approximately 20-25 *per cent* feeder separation only, REC conveyed (March 2015) its consent with condition to prioritize feeders where 30-40 *per cent* agriculture electrical loads were connected.

Out of 19379 rural feeders, the DISCOMs proposed segregation of 2551 feeders under DDUGJY as given in **Table 2.1**. The DISCOM-wise details of total rural feeders, feeders envisaged for segregation in DPRs and feeders segregated in actual are given in the table below:

Table No. 2.4
Details of total rural feeders, feeder segregation proposed/sanctioned and feeders actually segregated under DDUGJY upto March 2021

DISCOM	Total No. of rural feeders	Feeder segregation proposed and sanctioned in DPR against total rural feeders		Feeder segregated in actual against feeders sanctioned for segregation		Percentage of segregated feeders to total rural feeders
		No.	%	No.	%	%
Jaipur	4503	1351	30.00	992	73.43	22.03
Ajmer	7315	769	10.51	325	42.26	4.44
Jodhpur	7561	431	0.06	181	42.00	2.39
Total	**19379**	**2551**	**13.16**	**1498**	**58.72**	**7.73**

Source: DPRs and information provided by DISCOMs

It could be seen from the table above that feeder segregation proposed by Ajmer and Jodhpur DISCOMs was far below their initial commitment of 20-25 *per cent* of total rural feeders. Further, none of the three DISCOMs had prepared details of load percentage and length of the feeder before preparation of DPRs. Jaipur and Jodhpur DISCOMs have decided physical separation of HT feeders for agricultural and non-agricultural consumers in the villages having population of more than 3,000 upto 4,000 only, whereas no criterion was adopted by Ajmer DISCOM. Further, there was significant curtailment in feeder segregation work actually carried out than what was envisaged and approved in the DPRs.

Audit observed that the work of segregation of agriculture and rural feeder was initially assessed and undertaken in RE plan 2008 and an expenditure of ₹ 2,083.95 crore has been incurred on feeder improvement programme during XIth and XIIth five year plan. Besides, an expenditure of ₹ 329.29 crore has been incurred under DDUGJY. However, the DISCOMs could not complete the feeder segregation work till March 2021 as the DISCOMs could ensure segregation of 7.73 *per cent* (1498 rural feeders) of the total rural feeders under DDUGJY. In addition to funds sanctioned under DDUGJY for feeder segregation, the DISCOMs subsequently assessed (November 2015) additional requirement of ₹ 2,126.92 crore[18] to complete the feeder segregation work and

18 Jaipur DISCOM-₹ 877.87 crore, Ajmer DISCOM-₹ 789.76 crore and Jodhpur DISCOM-₹ 459.87 crore.

accordingly submitted the DPRs to REC for providing additional funds under DDUGJY.

Scrutiny of records of nine selected projects disclosed that the DISCOMs segregated only 271 feeders (upto December 2020) against 541 feeders envisaged in DPRs. Of these segregated feeders, 182 feeders of Jaipur and Jodhpur DISCOM were virtually segregated[19] whereas only ten feeders of Jaipur DISCOM were actually separated as agriculture and non-agriculture feeder. In case of remaining 79 segregated feeders, Ajmer DISCOM did not provide information of virtual and actual segregation of feeders.

Thus, even after taking up the work of feeder segregation long back in the year 2008 and incurring an expenditure of ₹ 2,083.95 crore and ₹ 329.29 crore in XIth & XIIth plan and under DDUGJY respectively, DISCOMs could not complete the work of separation of agriculture and non-agriculture feeders. Further, most of the feeders were segregated virtually instead of actual segregation of the feeders.

The Government accepted the fact of non-achievement of envisaged feeder segregation and stated that it could not be taken up due to insufficient funds under the Scheme. It further stated that DISCOMs focused more on domestic connections. During the Exit conference, the Government accepted that it had decided to opt for virtual separation of feeders since inception which was followed by DISCOMs till date. However, the State Government has now realised that physical separation of feeders is essential and therefore, it will be taken up under newly launched scheme of GoI[20] with special focus on feeders/ areas having high distribution losses.

The fact thus remained that even after deciding for physical separation of HT feeders, none of the three DISCOMs physically separated the agriculture feeders envisaged under the Scheme. Moreover, due to non-adherence to the Scheme guidelines for physical separation of feeders coupled with indecisiveness on physical separation of feeders, the DISCOMs incurred huge expenditure under various Schemes including DDUGJY to segregate only 7.73 *per cent* of total rural feeders.

Strengthening and augmentation of sub-transmission & distribution infrastructure

System strengthening

2.13 The issues relating to system strengthening are discussed in the following sub-paragraphs.

19 Where load of the feeder is diverted to new feeder without separation of agriculture and non-agricultural load.

20 Revamped Distribution Sector Scheme (June 2021).

Identification of critical gaps in sub-transmission and distribution network

2.13.1 DISCOMs were required to identify critical gaps in sub-transmission and distribution network considering all relevant parameters[21] and on-going works under other schemes for efficient management of distribution system.

Audit scrutiny of records disclosed that DISCOMs had not conducted any study to identify the critical gaps in sub-transmission and distribution network before formulation of DPRs. Further, load flow studies justifying creation of new and augmentation of 33/11 KV or 66/11 KV sub-stations was also not conducted which is evident from the fact that REC asked (September 2016) DISCOMs to provide the load flow studies of the proposed creation/ augmentation of sub-stations in DPRs. Audit observed that the DISCOMs did not provide the load flow studies till date.

The Government stated that the DISCOMs used real practical design data available with them along with examination of other parameters *viz*; voltage regulation, cost-benefit ratio and load catering efficiencies while proposing creation/augmentation of sub-stations. It further assured that new software based technologies would be adopted in future.

The reply was not satisfactory as load flow studies of the proposed sub-stations were neither found on record nor provided to REC.

Construction of sub-stations

2.13.2 The DISCOMs envisaged construction of 208 33/11KV sub-stations (SSs) under DDUGJY as given in **Table 2.1.** The DISCOM-wise details of creation of new SSs envisaged in DPRs (including associated 66/33/11KV lines) and SSs constructed in actual under system strengthening are given in the table below:

Table No. 2.5
Details of Sub-stations proposed and created upto March 2021 under DDUGJYs

Name of DISCOM	No. of SS proposed in DPR	No. of SS created at proposed site	No. of SS not created at proposed site	SS created at another site than proposed in DPR	No. of SS actually constructed
1	**2**	**3**	**4**	**5**	**6 (3+5)**
Jaipur	107	46	61	71	117
Ajmer	85	62	23	34	96
Jodhpur	16	9	7	8	17
Total	**208**	**117**	**91**	**113**	**230**

Source: DPRs and information provided by DISCOMs

It could be seen from the table above that only 117 SS (56.25 *per cent*) were constructed on the proposed site. Audit observed that each DISCOM has a dedicated 'Planning Wing' to oversee the planning of construction of 33/11KV SS. However, the Planning Wings of the three DISCOMs were not found involved before finalising the sites, to assess technical/financial viability, to carry out load flow studies of the proposed SS included in DPRs. It was also

21 Consumer mix, consumption pattern, voltage regulation, AT&C loss level, HT & LT ratio, optimum loading of transformers & feeders/lines, reactive power management, power factor improvement, standard of performance *etc.*

observed that the prescribed criteria/norms for construction of new 33/11KV SS in rural areas[22] issued (July 2014) as per orders of the Chairman DISCOMs, were not adhered to while formulating DPRs. Subsequently, after assessment by the Planning Wing, 91 SS were not found feasible for construction on the proposed sites which caused change in location of SS.

Besides above, other shortcomings regarding lack of coordination between Planning wing and DDUGJY wing noticed in construction of GSS were as under:

Jaipur DISCOM- In Alwar project, the Contractor (M/s India Commercial Services, Jaipur) commenced (November 2017) the construction of nine[23] SS despite the fact that SE Plan conveyed its approval for three[24] SS only by that time. Further in Jaipur project, construction of five[25] SS, initially included in project DPR, was subsequently excluded because construction of these SS had already been commenced (between September 2016 and July 2017) under CLRC and the work was near completion.

Ajmer DISCOM- Benefit to cost ratio in case of 21 SS constructed under the Scheme was found below the prescribed limit of 12 *per cent* and ranged between 8 *per cent* and 11.78 *per cent*.

Further, specific approval of District Electricity Committee and SLSC as regards subsequent changes in location of the sub-stations was not found on record which indicated that the matter related to change in location was not placed before these committees. Besides in selected projects of all the three DISCOMs, out of 46 SS[26], 17 SS[27] were not constructed on the sites proposed in respective DPRs, for which no justification was found on records.

Thus, non-adherence to the prescribed norms coupled with non-involvement of Planning wing while formulating DPRs, lack of co-ordination among various wings of DISCOMs resulted in inclusion of unviable SS in DPRs which led to change in location of 91 SS (43.75 *per cent* of the total envisaged SS).

The Government accepted the facts of not involving the planning wings of DISCOMs at the time of preparation of DPRs. It further stated that the change in locations were due to non-availability of land, acceptability of location as well as time gap in planning and execution of the projects. It was added that technical design parameters were adhered to while constructing the sub-stations. The Government also stated that SLSC approval for change in locations would be obtained and submitted to REC at the time of closure of projects.

The reply was not satisfactory as the constraints mentioned could have been resolved by apprising the issues in the regular meetings of SLSC/DEC which was not done.

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22 Availability of suitable land, distance from the existing SS, CMRI load survey, benefit to cost ratio (12 *per cent*) *etc.*

23 Basai Jogiyan, Ghat, Doli, Baroda Khan, Sitaram Nagla, Romija Than, Shri Chandpura (Not constructed under the Scheme because of land dispute), Tahala, Palpur.

24 Basai Jogiyan, Ghat, Doli

25 Tanda and Sumel (in APP 2017-18) Ghasipura, Surana Todi and RIICO Shahpura (in APP 2018-19)

26 Jaipur DISCOM-19 SS, Ajmer DISCOM-23 SS and Jodhpur DISCOM- 4 SS.

27 Jaipur DISCOM-12 SS, Ajmer DISCOM-3 SS and Jodhpur DISCOM- 2 SS.

Transformer capacity

2.13.3 To assess the failure rate of Distribution Transformers (DTs), DISCOMs Coordination Forum (DCF) decided (July 2009) norms for issuing connections from single phase DTs. DISCOMs subsequently modified (February 2017) the norms and prescribed the 'Diversity Factor' 1:1 for releasing connections in rural areas, under various schemes (including DDUGJY). As per the prescribed Diversity Factor, the DISCOMs were required to release one connection against one KVA capacity of transformer. Accordingly, the DISCOMs were to install 5 KVA, 10 KVA and 16 KVA DTs for releasing connections from one to five consumers, from six to 10 consumers and 11 to 16 consumers respectively.

The DISCOMs envisaged installation of 39,084 DTs against which 75,093 DTs were installed upto March 2021 **as given in Table 2.1.**

To evaluate the laid down norms for transformer capacity, Audit sought (August 2020) DT wise details of connections released from each DT installed under DDUGJY. However, none of the three DISCOMs provided the desired information till January 2021. The DISCOMs, however, provided the village-wise information of infrastructure created under DDUGJY upto August 2020[28] prepared for the purpose of inspection to be carried out by REC Quality Monitors (RQM). Thereafter, village-wise information of infrastructure created under DDUGJY was not found updated.

The village-wise information of infrastructure created under DDUGJY upto August 2020 depicted installation of 56,568 DTs[29]. Audit analysis of these newly installed DTs disclosed that the DISCOMs did not adhere to the norms in implementation of the Scheme and installed over capacity[30]/ under capacity[31] transformers as shown in the table below:

Table No. 2.6
DISCOM-wise details of transformer installed upto 31 August 2020

DISCOM	Transformer capacity						
	At capacity		Under capacity		Over capacity		Total
	No.	%	No.	%	No.	%	No.
Jaipur	881	5.33	628	3.80	15007	90.87	16516
Ajmer	5536	64.47	448	5.22	2603	30.31	8587
Jodhpur	21744	69.11	2395	7.61	7326	23.28	31465
Total	**28161**	**49.78**	**3471**	**6.14**	**24936**	**44.08**	**56568**

Source: Progress reports of DDUGJY

Audit observed that:

Jaipur DISCOM, while formulating the DPRs proposed only 16KVA capacity transformers for releasing connections to rural households (RHHs) irrespective of number of un-electrified RHHs in a village. Accordingly, the DPRs were approved by the MC.

28 Jaipur and Jodhpur DISCOM (June 2020) and Ajmer DISCOM (August 2020).
29 16,700 DTs of 5 KVA, 16,925 DTs of 10 KVA, 22,879 DTs of 16 KVA and 64 DTs of 25 KVA
30 Over capacity transformer: where in place of the installed transformer, a lesser capacity transformer would suffice to release the requisite number of connections.
31 Under capacity transformer: where the number of connections released from the transformer was more than the KVA capacity of the transformer.

Ajmer DISCOM kept provision of only three 10 KVA transformers in project DPR of Banswara whereas in other projects of DISCOM, provision of all capacity (5 KVA, 10 KVA, 16 KVA and 25 KVA) was kept. Further, it did not provide the details of rating wise transformers procured and installed under DDUGJY.

Jodhpur DISCOM kept provision for transformer of each capacity (5 KVA, 10 KVA and 16 KVA). However, it did not ensure installation of transformers as per the required capacity. Lack of vigilance led to installation of overcapacity and under capacity transformers by the contractors than was required as per the diversity factor. In one of the selected project (Pali), Audit observed that the competent authority allowed the contractor to install 10 KVA transformers due to non-availability of 5 KVA transformers. Accordingly, the contractor installed 739 DTs of 10 KVA for release of connections that ranged between one and four connections.

The Government accepted the facts and stated that higher capacity DTs were allowed due to absence of provision in contract agreement/non-availability of lesser capacity DTs.

The fact remained that installation of overcapacity transformers resulted in excess expenditure and deprived resources for other activities as discussed in **paragraph 2.13.4.**

Excess expenditure of ₹ 53.15 crore on abundant transformer capacity

2.13.4 Pursuant to the diversity factor (1:1) prescribed by DCF, DISCOMs were required to install DTs keeping in view the number of connections to be released. Since, the DISCOMs did not maintain DT wise details of connections released, the village-wise information of infrastructure created under DDUGJY was further analysed to assess adequacy of installation of 10 KVA DTs (6,301 DTs) and 16 KVA DTs (18,571) as per norms laid down by DCF.

Audit scrutiny disclosed that DISCOMs installed DTs which had capacity higher than the capacity laid down under the relevant norms as depicted in the table below:

Table No. 2.7
Use of DTs having capacity higher than the prescribed capacity

DISCOM	No. of 10 KVA DTs	No. of 16 KVA DTs			Grand Total
	Used for releasing 1 to 5 consumer connections	Used for releasing 1 to 5 consumer connections	Used for releasing 6 to 10 consumer connections	Total	
Jaipur	0	11722	3285	15007	15007
Ajmer	1027	74	1438	1512	2539
Jodhpur	5274	1064	988	2052	7326
Total	**6301**	**12860**	**5711**	**18571**	**24872**

Source: Information provided by DISCOMs.

Thus, the DISCOMs did not install DTs as per the laid down norms as major chunks of 10 KVA DTs (37.23 *per cent*) and 16 KVA DTs (81.17 *per cent*) were installed where installation of DTs having lesser capacity would have sufficed for meeting the requirement of releasing connections to the consumers.

This was mainly due to non-inclusion of requirement of 5 KVA and 10 KVA DTs in DPRs[32]. Besides, there were instances where Ajmer and Jodhpur DISCOM, despite having provisions for 5-10 KVA DTs in DPRs, installed DTs having higher capacity than required as per the laid down norms.

Resultantly, the DISCOMs incurred excess expenditure of ₹ 53.15 crore[33] on installation of DTs in excess of required capacity. Impact of non-compliance was even higher and multi-fold as Jaipur DISCOM, while corresponding with REC, itself realised (July 2017 and December 2017) that installation of DTs having higher capacity would not only increase their financial burden and technical losses but it would also give space to misuse/theft of electricity.

The Government stated that the Common Specification Committee of the DISCOMs decided (October 2015) to utilise DTs in line with RGGVY XII plan and therefore, CLPC of Jaipur DISCOM considered (November 2015) only 16 KVA DTs for awarding the projects. It further stated that Ajmer and Jodhpur DISCOMs were not having DT wise details of connection released with them and assured to provide the detailed data shortly.

The reply was not convincing as the DISCOMs adopted inconsistent approach for procurement of DTs. Further, Jaipur DISCOM belatedly realised the requirement of lesser capacity DTs (5 KVA/10 KVA) and approached REC to allow replacement of 16 KVA DTs with lesser capacity DTs which was not permitted by REC. Besides, detailed information on DT wise connection was awaited **(November 2021)**.

Performance of transformers installed

2.13.5 As per the 'Diversity Factor', one connection was to be released against one KVA capacity of transformer in rural areas. DISCOMs, however, did not adhere to the direction and released more connections than the capacity of the transformer. As evident from **Table-2.6** above, DISCOMs installed 3471 under capacity transformers *i.e.* number of connections released were more than the capacity of the transformer and hence the transformer was overburdened from day one of its installation and on higher risk of burning.

To assess the performance of installed transformers in the selected projects, Audit obtained the data of transformers installed and burnt transformers as detailed below:

32 All the 12 DPRs belonged to Jaipur DISCOM and one DPRs (Banswara) belonged to Ajmer DISCOM did not have provision for installing 5-10 KVA DTs and 10 KVA DTs respectively.

33 DISCOM wise excess expenditure worked out to be ₹ 36.51 crore (Jaipur DISCOM), ₹ 3.71 crore (Ajmer DISCOM) and ₹ 12.93 crore (Jodhpur DISCOM) which had been computed on the basis of Store Issue Rates decided (March-April 2017) for the DTs in parallel to placement of turnkey contracts for the projects under DDUGJY.

Table No. 2.8
Detail of installed and burnt transformers in selected projects
(as on January 2021)

DISCOM	Selected Project	No. of transformers installed	No. of transformers burnt	Percentage of burnt transformers
Jaipur	Tonk	1316	440	33.43
	Bundi	743	58	7.81
	Bharatpur	1374	96	6.99
Ajmer	Ajmer	438	12	2.74
	Sikar	2188	176	8.04
	Banswara	4836	182	3.76
Jodhpur	Barmer	16318	937	5.74
	Pali	1174	291	24.79
	Jalore	3257	131	4.02
Total		**31664**	**2323**	**7.33**

Source: Information obtained from selected projects

It could be seen that the failure rate of installed transformers during the four years period from 2017-18 to 2020-21 was abnormally higher in all the selected projects except in Ajmer, Banswara, Barmer and Jalore as compared to acceptable failure rate of transformers (*i.e.* 1.50 *per cent* per annum) specified by the MoP. Audit further noticed that in case of Tonk project, matter regarding installation of under capacity transformers which may lead to burning was reported time and again to the Executive Engineer, however, no action was found taken on record in this regard. Though the burnt transformers were replaced by the concerned contractors as these were under warranty, the villagers suffered power interruption to the extent of time taken in replacement of burnt transformers.

The Government accepted the facts.

Construction of new feeders as a part of system strengthening

2.13.6 Normally a primary distribution line or feeder is designed to carry a load of 1-4 MVA depending on the feeder length, and so the number of Feeders emanating from a secondary substation at 11kV is three or more. Further, REC provided the drawings and designs of the SS to be constructed under the Scheme. Accordingly, on newly created 230 SS, 918 numbers[34] new feeders were constructed by all the three DISCOMs. Audit analysis of 182 newly constructed feeders[35] in selected projects disclosed that DISCOMs instead of creating separate feeder for agriculture and non-agriculture load, kept mix load on these feeders. Thus imprudent planning of the DISCOMs defeated the very purpose of the Scheme *i.e.* facilitating judicious rostering of supply to agricultural & non-agricultural consumers in the rural areas. Moreover, despite incurring an expenditure of ₹ 12.55 crore[36] on construction of these feeders

34 Jaipur DISCOM-452 feeders, Ajmer DISCOM-424 feeders and Jodhpur DISCOM- 42 feeders.
35 Jaipur DISCOM-73 feeders, Ajmer DISCOM-106 feeders and Jodhpur DISCOM- 3 feeders.
36 Jaipur DISCOM-₹ 4.37 crore, Ajmer DISCOM-₹ 7.77 crore and Jodhpur DISCOM-₹ 0.41 crore.

(11kV line) in selected projects, DISCOMs would have to incur further expenditure on segregation of such feeders in future.

The Government stated that due to fund constraints, Jaipur DISCOM decided to create feeders to feed power supply directly to the villages having population of 3000 or more for ensuring 24 hours power supply. It further stated that Ajmer DISCOM tried to go for effective planning regarding separate agriculture feeders. However, in few parts of the State, the habitat pattern was not supportive for feeder separation.

The reply was not acceptable as none of the selected projects (except Barmer) were having scattered habitats. Hence, physical segregation of agriculture feeders and non-agriculture feeders could have been done for judicious rostering of electricity supply in the rural areas.

Installation of new meters/replacement of defective meters

2.13.7 Under DDUGJY, DISCOMs were required to envisage metering at distribution transformers, feeders and at consumer's end. DISCOMs, however, envisaged requirement of 9,61,827 consumer energy meters for releasing connections/ replacement of defective meters and 8,562 feeder meters (including 3,626 defective feeder meters) as given in **Table 2.1.** Further, DISCOMs did not keep any provision for installation of meters at DTs.

Audit analysis of records related to installation of meters at distribution transformers, feeders and at consumer's end disclosed that:

- **Metering at distribution transformers:** Since none of the three DISCOMs kept provision for installation of meters at DTs, the DISCOMs did not install meters on the 75,093 DTs.
- **Metering at consumer's end:** Connections were released under DDUGJY and the three DISCOMs installed 5,89,838 meters at consumer's end.
- **Replacement of defective consumer meters:** Jaipur and Ajmer DISCOMs did not replace even a single defective meter under DDUGJY despite the fact that an amount of ₹ 97.10 crore[37] was sanctioned for replacement of defective meters. Further, in-spite of having 2,08,110 defective consumer meters, Jodhpur DISCOM did not provide for replacement of such meters in DPRs.
- **Metering at feeders:** 3,626 defective feeder meters[38] were not replaced despite sanction of fund under the Scheme.

As per Terms and Conditions of Supply (TCOS), the defective consumer meters were required to be replaced within two months of detection and in case those were not replaced within the stipulated period, a rebate of five *per cent* on the total bill was to be allowed from third monthly bill in case of monthly/ fortnightly billing and second bill in case of bimonthly billing after such detection till the meter is replaced.

37 Jaipur DISCOM-₹ 32.43 crore, Ajmer DISCOM-₹ 64.67 crore
38 Jaipur DISCOM-1525, Ajmer DISCOM-964 and Jodhpur DISCOM-1137.

In selected projects of all the three DISCOMs, Audit observed that 2,81,580 consumer meters were lying defective as on 31 March 2020 for a period of more than two months from the detection of the defect. However, the same were not found replaced and hence the O&M Circle offices had to pass on the rebate of five *per cent* of the billed amount. Audit noticed that the DISCOMs had passed on a rebate of ₹ 50.37 crore during 2016-20 on account of non-replacement of defective consumer meters within stipulated time period.

Thus, the DISCOMs failed to achieve the target of installation of meters on DTs and replacement of defective feeder meters as well as consumer meters. Moreover, in the absence of metering arrangement at distribution transformers and non-replacement of defective feeder meters, DISCOMs failed to ensure a robust mechanism for proper energy accounting. Besides, DISCOMs also failed in identifying high loss pockets and ensuring remedial measures towards reduction of losses due to theft *etc*.

The Government stated that DT metering as well as replacement of defective domestic and feeder meters were not considered in the scope of DDUGJY due to lack of concentrated load in rural areas and DISCOMs carried out replacement of defective meters on regular basis.

The reply was not satisfactory as the Scheme envisaged replacement of defective meters and the MoP had also sanctioned funds on this account. Thus, the DISCOMs failed to ensure seamless accounting and auditing of energy at all levels of distribution system.

Rural electrification

Rural electrification includes electrification of villages as well as electrification of households and thus, involves development of rural electricity infrastructure for attaining the goal of providing electricity access to all un-electrified villages and households. Status of electrification of villages and households is discussed in **Para 2.14 and 2.15** below.

Village electrification

2.14 Prior to October 1997, a village is classified as electrified if electricity is being used within its revenue area for any purpose whatsoever. After October 1997, a village is deemed as electrified if the electricity is used in the inhabited locality, within the revenue boundary of the village for any purpose whatsoever. Subsequently, the MoP's office memorandum (February 2004) and Rural Electrification Policy (August 2006) specified that a village would be declared as electrified, if (1) basic infrastructure such as distribution transformer and distribution lines are provided in the inhabited locality as well as a minimum of one *dalit basti* hamlet where it exists; (2) electricity is provided to public places like schools, *panchayat* offices, health centers, dispensaries, and community centers *etc.* and (3) the number of households electrified should be at least 10 *per cent* of the total number of households in the village.

(i) DISCOM-wise details of total number of villages, villages electrified upto March 2015, villages to be electrified before DDUGJY and number of un-electrified villages (UEVs) sanctioned under different schemes/plan are shown in the table below:

Table No. 2.9
DISCOM-wise details of total number of villages, villages electrified and un-electrified villages

DISCOM	Total villages as per 2011 Census	Villages electrified upto March 2015	Villages to be electrified before DDUGJY	No. of UEVs sanctioned under RGGVY 12th Plan	No. of UEVs to be electrified by RRECL	No. of UEVs sanctioned under DDUGJY
Jaipur	15145	14710	435	4	77	9
Ajmer	15379	15043	336	41	23	80
Jodhpur	14148	13780	368	194	52	15
Total	**44672**	**43533**	**1139**	**239**	**152**	**104**

Source: Census data, Progress Reports and information provided by DISCOMs

As per the Progress Reports of the DISCOMs (31st March 2015), 1,139 villages remained to be electrified before DDUGJY. However, as per the data made available to REC (October 2015), there were 495 UEVs in Rajasthan, 239 of which were already been sanctioned under 12th Plan (Ist Phase) whereas 152 UEVs were to be electrified by RRECL. Remaining 104 UEVs were sanctioned under DDUGJY.

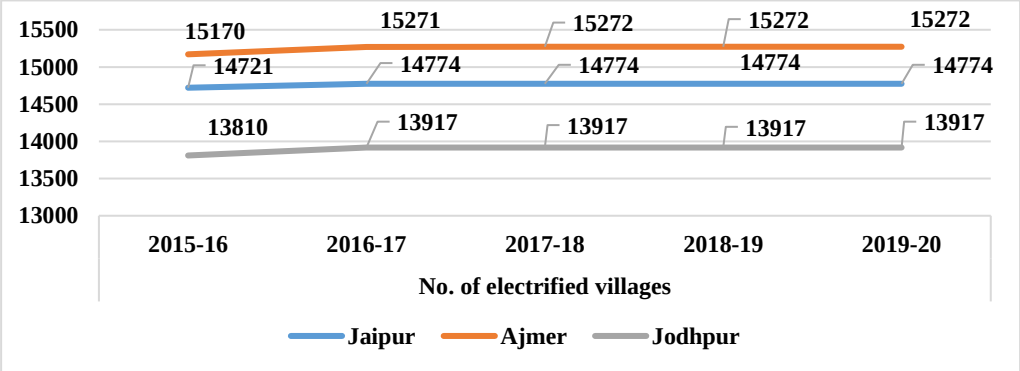
Audit observed that due to mismatch in data of UEVs, against 748 remaining UEVs (1139-239-152), the three DISCOMs proposed electrification of 104 UEVs only under DDUGJY. Further, as per the Progress Report as on 31 March 2020, 709 villages[39] of three DISCOMs were pending electrification. The mismatch in data of UEVs and non-coverage of all the pending UEVs depicted that village electrification proposed by DISCOMs under DDUGJY was not backed by proper survey and analysis. Thus, the planning for village electrification was faulty.

(ii) As depicted in **Table 2.9**, DISCOMs envisaged electrification of 104 UEVs in DPRs under DDUGJY. Review of records disclosed that out of total 104 UEVs, 12 UEVs (Ajmer-4 and Jodhpur-8) were already electrified whereas 79 UEVs (Jaipur-9, Ajmer-65 and Jodhpur-5) got electrified under CLRC prior to award of contracts under DDUGJY. Besides, 13 UEVs (Jodhpur-2 and Ajmer-11) got electrified through Rajasthan Renewable Energy Corporation Limited. Thus, all the 104 UEVs envisaged for electrification under DDUGJY were already electrified/ electrified through other means which indicated that electrification of UEVs considered under DDUGJY was not realistic.

The Annual Progress Reports of the DISCOMs for the period 2015-20 also depicted that only one UEV (Ajmer DISCOM) got electrified (2017-18) after inception of DDUGJY as shown in the chart below:

39 Jaipur DISCOM-371 UEVs, Ajmer DISCOM-107 UEVs and Jodhpur DISCOM-231 UEVs.

Chart No. 2.2
Status of village electrification at the end of 2015-16 to 2019-20



Source: Annual Progress Reports of DISCOMs

Audit further observed that DISCOMs incorrectly declared the UEVs as electrified because the parameters prescribed under new definition were not completely accomplished as discussed in **paragraph 2.15.4.** Audit also observed that the electricity connections were not provided to 3,093 Nos. of Government Schools belonging to nine selected districts/ projects. Hence, as per the new definition, these UEVs (including 104 UEVs covered and declared electrified under DDUGJY) should not be considered electrified.

The Government stated that the 709 villages, being unpopulated, were not considered for electrification. It further stated that the DISCOMs had created requisite infrastructure up to public places in all the UEVs but these institutions did not come forward to obtain electricity connections.

The reply was not satisfactory because declaration of village as electrified without electrification of public places was incorrect. Further, Energy Department, being the nodal department implementing the scheme, was required to fulfil the criteria of electrification through co-ordination with other departments before declaring the UEVs as electrified.

Household electrification

2.15 GoI and GoR issued (13 December 2014) a joint statement for implementation of 'Power for All' programme with the objective to supply 24 X 7 quality, reliable and affordable power to all domestic, commercial, industrial consumers and adequate power supply to agriculture consumers within a fixed time frame. Further, all unconnected households (including rural households envisaged under DDUGJY) were to be provided access to electricity in phased manner by March 2019.

To achieve the objective of the programme, DISCOMs issued (February 2018) directions to release the connections to APL households who have deposited the demand note upto 22 February 2018 and from 22 February 2018 by 15 March 2018 and 31 March 2018 respectively. Further, as per the aims of RGGVY (subsumed in DDUGJY) and tripartite agreement executed, the connections to BPL were to be provided free of cost.

Audit noticed that DISCOMs envisaged to provide electricity connection to 20.58 lakh rural households (13.36 lakh under 12th Plan and 7.22 lakh under DDUGJY), of which 15.20 lakh electricity connections (9.35 lakh under 12th Plan and 5.89 lakh under DDUGJY) were provided upto March 2021.

Release of connections under DDUGJY

2.15.1 Year-wise detail of connections released to un-electrified RHHs (both BPL and APL) under DDUGJY upto March 2021 is given in the table below:

Table No. 2.10
DISCOM-wise detail of connections released to un-electrified BPL and APL rural households upto 31 March 2021

DISCOM	Un-electrified RHHs/ electrification targets as per DPRs		Connection released between September 2017 and March 2018		Connections released upto March 2019		Connections released upto March 2020		Connections released upto March 2021	
	BPL	APL	BPL	APL	BPL	APL	BPL	APL	BPL	APL
	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Jaipur	24794	128094	11943	49317	18944	98280	22066	116018	22066	116018
Ajmer	111711	102173	19038	16913	103649	86256	123218	86256	131153	86256
Jodhpur	97705	257883	6270	39128	42174	161332	45910	170168	47087	187258
Total	**234210**	**488150**	**37251**	**105358**	**164767**	**345868**	**191194**	**372442**	**200306**	**389532**
		722360		**142609**		**510635**		**563636**		**589838**

Source: DPRs and information provided by DISCOMs

Audit noticed that DISCOMs relaxed the condition of testing of material required for release of connection in Central Testing Laboratory (CTL) in order to expedite the release of connections and to achieve the target of power to all latest by March 2018. However, all the three DISCOMs failed to achieve the target of power to all un-electrified households by March 2018 and only 19.74 *per cent* connections (1,42,609 connections against 7,22,360 targeted connections) were released by March 2018. By March 2021, 81.65 *per cent* (5,89,838) of the targeted households (7,22,360) could be connected under DDUGJY.

Further, under DDUGJY, DISCOMs were liable to provide connections to BPL rural households free of cost. DISCOMs were expected to provide connections to all the unelectrified BPL rural households. However, the DISCOMs, could provide connections to only 15.90 *per cent* BPL rural households till March 2018. Besides, two DISCOMs (Jaipur and Jodhpur) could not achieve the targeted electricity connections to BPL families till March 2021 and there was a shortfall of 2,728 (11 *per cent*) and 50,618 (51.81 *per cent*) connections respectively. Ajmer DISCOM provided 19,442 extra electricity connections to BPL families than the number of connections targeted under the scheme. Thus, only 85.52 *per cent* BPL rural households could be given connection till March 2021.

Audit observed that even after relaxing the condition of testing of material in CTL and thus, risking the quality of material, DISCOMs' achievement was short of the targets of providing electricity connections to all un-electrified consumers.

The Government accepted the facts and stated that Ajmer and Jodhpur DISCOMs did not relax any quality diluting condition including CTL testing. It further stated that although the CTL testing was relaxed in Jaipur DISCOM to expedite the RHH electrification, however, it did not compromise with the quality of material as during pre-dispatch inspection, the material was jointly inspected at the workshops of manufacturer. Besides, Jaipur DISCOM had issued connections to all the undisputed, wilful and eligible households.

The reply was not convincing as Jaipur DISCOM did not furnish any document confirming release of envisaged connection within the stipulated timeframe. Further, Jodhpur DISCOM did not reply to the non-achievement of envisaged release of connections.

The performance of DISCOMs in providing electricity connections to BPL/ Public Institutions is discussed in subsequent sub-paragraphs**.**

Release of connections to BPL households

2.15.2 One of the prime objective of RGGVY (subsumed in DDUGJY) was to provide electricity connection to Below Poverty Line (BPL) families free of charge. Accordingly, electricity connections to 4.43 lakh[40] BPL families and 2.34 lakh BPL families were envisaged to be provided under 12th Plan (Ist phase) and DDUGJY respectively. However, the DISCOMs could provide electricity connections to 2.41 lakh[41] BPL families (upto December 2019) and 2.00 lakh[42] BPL families (upto March 2021) respectively under these schemes.

The Government stated that in Jaipur DISCOM, electricity connections were issued to all the undisputed, wilful and eligible households. It further stated that Jodhpur DISCOM prepared additional DPRs to cover-up post Saubhagya and DDUGJY connections for additional rural households identified after cut-off date *i.e.* 31 March 2019.

The reply was not convincing as DISCOMs were liable to provide electricity access to all the BPL households which was not ensured.

Delay/shortcomings in release of connections

2.15.3 As per the Revenue Manual of DISCOMs, the electricity connection should be released within 15 days from the date of issue of Service Connection Order (SCO). An analysis of data related to release of electricity connections in selected projects as furnished by the three DISCOMs is depicted in table below:

Table No. 2.11
Delay in release of electricity connections

(Figures: in Number)

Particulars	Jaipur	Ajmer	Jodhpur
Connections released after 1 April 2017	18258	36830	32710
Connections released within prescribed timeframe	3678	36830	32709
Connections released beyond prescribed timeframe	14580	0	1
• Delay upto one year	14050	0	1
• Delay from one year to three years	489	0	0
• Delay from three years to five years	27	0	0
• Delay for more than five years	14	0	0

Source: Information furnished by the DISCOMs.

Audit observed that Jaipur DISCOM released 14050 connections with delay upto one year whereas release of 530 connections was significantly delayed *i.e.* from one year to more than five years. Further, as per the data furnished to audit, the date of issue of SCO and release of connection in all the cases of Ajmer

40 Jaipur DISCOM-1.35 lakh, Ajmer DISCOM-1.49 lakh and Jodhpur DISCOM-1.59 lakh.
41 Jaipur DISCOM-52,206, Ajmer DISCOM-1,12,012 and Jodhpur DISCOM-76,924.
42 Jaipur DISCOM-22,066, Ajmer DISCOM-1,31,153 and Jodhpur DISCOM-47,087.

DISCOM and Jodhpur DISCOM (except one case) was found same. This indicated that the data furnished by these two DISCOMs was not reliable.

Further analysis of data disclosed that the electricity connections to 4,804 consumers[43], wherein SCO was issued before March 2017 *i.e.* prior to award of works, were claimed under DDUGJY.

The Government accepted the facts and stated that the release of connections was delayed due to directions to release feeder-wise connections instead of issue of SCOs, ROW problems, disputes among beneficiaries regarding location of DTs, *etc.*

Extent of electrification of public institutions

2.15.4 Besides other conditions stipulated in the new definition of village electrification, a village would be declared electrified if electricity is provided to public places like schools, *panchayat* offices, health centers, dispensaries, and community centers *etc.* REC also emphasized (12 May 2017) to extend electricity infrastructure to these public institutions as a vital component of village electrification under DDUGJY. Further, GoR requested (15 June 2017) the DISCOMs to provide electric connections to un-electrified schools on priority.

Audit noticed that REC forwarded (May 2017) a copy of a letter of Ministry of Human Resources Development (MHRD) to the State Government, which stipulated that 45,576 schools were running without electricity supply connections in Rajasthan State. REC asked the State Government to reconcile the data of un-electrified schools in rural areas and provide information in prescribed format for providing electricity infrastructure for these schools. In response, the State Government informed (May 2017) that 30,191 schools in rural areas did not have electricity connections. Subsequently, MoP, GoI directed (July 2019) all the State Governments to ensure electrification of all schools in the villages as they have declared 100 *per cent* electrification of all the villages. Further, it was also advised to consider lower tariff category for the Government schools which would reduce their operation cost and also motivate them to avail electricity connection.

Audit observed that the DPRs prepared by DISCOMs did not have provision for electricity infrastructure required for providing connections to Government schools in rural areas under DDUGJY. Besides, the State Government/ DISCOMs neither initiated action for lower tariff for Government schools nor ensured electricity connections to all schools in rural areas. Further, GoI declared (April 2018) Rajasthan State as 100 *per cent* electrified on the basis of information provided by the State.

Audit observed that the information provided by the State/DISCOMs was incorrect as all the parameters for declaring 100 *per cent* electrification were not completed as envisaged. This is apparent from the fact that electric connections could not be provided to 10,320 schools situated in rural areas of the State (November 2020). Information relating to electrification of other public places like *panchayat* offices, health centres, dispensaries, and community centres *etc.* was not available.

43 Jaipur DISCOM-3,215, Ajmer DISCOM-137 and Jodhpur DISCOM-1,452.

Thus even after implementation of DDUGJY, DISCOMs failed to achieve the target of 100 *per cent* village electrification in the State.

The Government accepted the fact of non-achievement of electrification of all the government schools. It further stated that although the necessary infrastructure was created up to the public places in all the UEVs, however connections were issued after receipt of application and deposit of demand.

The reply was not satisfactory as declaration of village as electrified without fulfilling the laid down criteria, was incorrect.

Performance of electricity supply

2.16 One of the prime objective of DDUGJY was to provide 24x7 power supply for non-agricultural consumers and adequate power supply for agricultural consumers. For electricity to be reliably delivered, there must be sufficient generation capacity to meet peaks in demand; electricity should be consumed efficiently; and T&D systems should not suffer excessive outages.

The position of energy demand, energy demand met, peak demand and peak demand met during FY 2016-17 to FY 2019-20 is depicted in the table below:

Table No. 2.12
Details of Energy Demand and Peak Demand shortages in Rajasthan during 2016-20

(Figures in Million Units)

Year	2016-17	2017-18	2018-19	2019-20
Energy demand	67638	71194	79815	81281
Energy demand met	67415	70603	79626	81222
Shortage	**223**	**591**	**189**	**59**
Peak demand	10613	11722	13276	14277
Peak demand met	10348	11564	13276	14277
Shortage	**265**	**158**	**0**	**0**

Source: CEA data.

The gap between energy requirement and energy availability in the State during last four years, ending on 31 March 2020, was negligible. Similarly, the gap between peak demand and peak demand met during 2016-17 and 2017-18 ranged between 2.50 *per cent* and 1.35 *per cent* only whereas during 2018-19 and 2019-20, the State was able to meet the peak demand 100 *per cent*.

Billing cycle

2.17 Rajasthan Electricity Regulatory Commission in its tariff order 2017 mandated that DISCOMs should take steps for necessary changes in the billing software, so that at least from 1 April 2018, the billing is made on monthly basis for all category of consumers.

Audit noticed that Jaipur DISCOM issued electricity bills to domestic consumers on bimonthly[44] basis upto April 2019, except in Jaipur Project wherein the bills are being issued on monthly basis from January 2019. Further, Ajmer and Jodhpur DISCOMs belatedly commenced (December 2020) monthly billing in two projects and one project respectively whereas in rest of the

44 Bi-monthly stands for "once in every two months".

projects they did not introduce monthly billing. Audit observed that Ajmer and Jodhpur DISCOMs were not prompt in implementation of order of RERC.

The Government accepted the facts and stated that monthly billing is being done in Ajmer City Circle only.

The fact thus remained that Ajmer DISCOM (Except Ajmer City Circle) and Jodhpur DISCOM did not comply with the directions of RERC.

Electricity bill paying capability of BPL

2.18 Clause-21 of Revenue Manual of DISCOMs provides that the first bill shall not be delayed beyond three months from the date of release of connection.

Audit noticed that in rural areas of all the three DISCOMs, the electricity bills are not being issued on regular basis. In such instances, the beneficiaries feel that they cannot pay the whole amount in one go and therefore sometimes face huge accumulated arrears and even threat of disconnection. During the course of beneficiary survey, instances of incorrect billing were also noticed as discussed in **paragraph 6.7.**

a) Delay in issue of first bill

Analysis of billing data (FY 2019-20) of 99,342 beneficiaries in nine selected projects of all the three DISCOMs disclosed that there was a considerable delay ranging between one day and 1,289 days in issue of Ist bill to 8,940 beneficiaries[45]. The billing data (FY 2019-20) was also found incomplete as it did not have records of 6,920 beneficiaries of selected projects.

b) Bills to BPL beneficiaries

Analysis of MIS records of DISCOMs (March 2020 to November 2020) disclosed that there was a shortfall in issue of electricity consumption bills to regular BPL consumers in rural areas. In Jaipur DISCOM, electricity bills ranging between 18.35 *per cent* and 20.60 *per cent* were not issued to regular BPL rural consumers. The MIS of Ajmer and Jodhpur DISCOM has shown the reverse position *i.e.* the number of electricity bills issued were more than the number of regular BPL rural consumers, which indicates that the MIS was either incorrect or the supplementary bills issued during the month were also included in the figures of bills issued.

Analysis of MIS further disclosed that there was an increasing trend in Permanently Disconnected Consumer (PDC) in BPL category in rural areas of DISCOMs. In Jaipur DISCOM, BPL PDC in rural areas increased from 1,00,176 in March 2020 to 1,09,270 in November 2020. Similarly in Ajmer and Jodhpur DISCOM, it increased from 1,19,908 to 1,21,536 and 56,448 to 57,069 PDC respectively during the same period. Further analysis of beneficiaries in selected projects disclosed that the electricity connection of 2,047 beneficiaries was disconnected as on 31 March 2020. Of these 2,047 beneficiaries, 919 beneficiaries were converted into PDC. Continuous increase in number of BPL PDC indicates that the BPL consumers were not in a position to pay the electricity bills.

45 Jaipur DISCOM-1,234 (1 to 632 days), Ajmer DISCOM-5,722 (1 to 1,289 days) and Jodhpur DISCOM-1,984 (1 to 1,016 days).

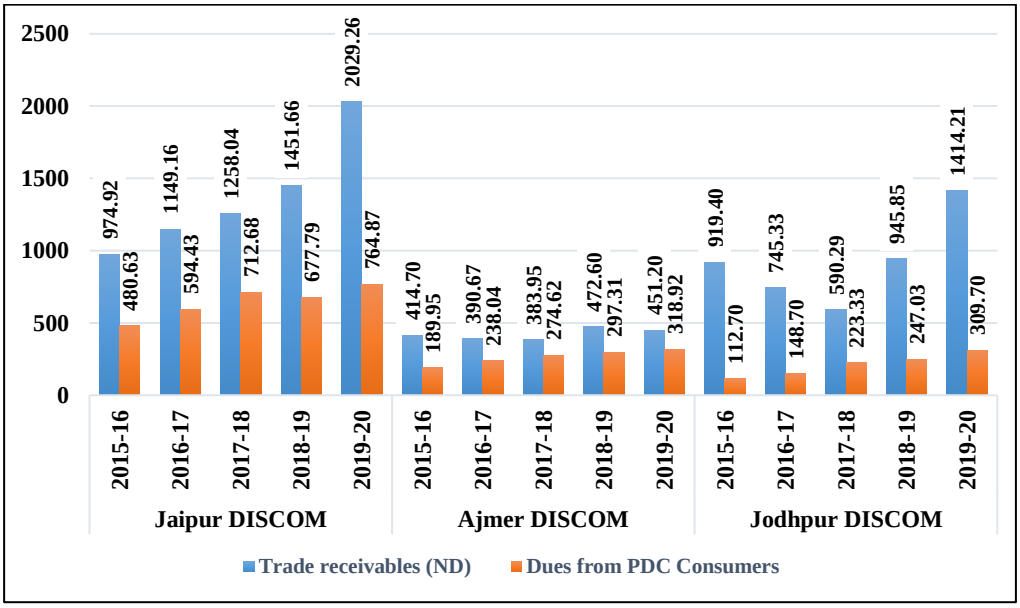
The Government accepted the facts and stated that due to poor economic conditions, the BPL beneficiaries failed to pay electricity bills which led to increase in PDC.

Extent of default of payment

2.19 An analysis of trade receivables on account of sale of power by three DISCOMs disclosed that there was an increasing trend in trade receivables for sale of power as well as dues against PDC. DISCOM-wise position of trade receivables and dues against PDC is depicted in the chart below:

Chart No. 2.3
DISCOM-wise status of trade receivables for sale of power and dues against PDC

(₹ in crore)



It could be seen that there was continuous increase in trade receivables against sale of power to regular consumers as well as against PDC except in 2018-19 in Jaipur DISCOM. Audit noticed that DISCOMs did not maintain details of the outstanding dues against category-wise regular consumers and PDC. Audit could not ascertain the periodicity of outstanding dues against PDC in the absence of such data. Audit observed that DISCOMs were not prompt in recovering their dues from PDC which is evident from continuous increase in dues against PDC.

The Government stated that DISCOMs maintain category-wise details of outstanding dues from regular and PDC consumers and furnished sample documents in support of reply.

The reply was not convincing as even the furnished documents did not contain category-wise details of outstanding dues from PDC. Further, the reply was silent on the issue of continuous increase in outstanding dues from PDC.

Aggregate Technical and Commercial Losses

2.20 Transmission and distribution (T&D) losses represent electricity that is generated but does not reach intended customers. T&D losses are the result of

technical inefficiency (*viz*. loss of electricity occurring due to resistance of wires and equipment) and theft. Further, the concept of Aggregate Technical & Commercial (AT&C) losses provides a realistic picture of the loss in the context in which it is measured. It is a combination of energy loss (technical loss + theft + inefficiency in billing) and commercial loss (default in payment + inefficiency in collection). The AT&C loss are measured by using formula *i.e.* {1-(Billing Efficiency X Collection Efficiency)} X 100.

One of the prime objectives of the Scheme was reduction of AT&C losses as per trajectory (DISCOM-wise) finalized by the Ministry of Power in consultation with States. The targets to reduce the AT&C losses as determined by MoP *vis-à-vis* actual achievement are given in the table below:

Table No. 2.13
Detail of approved trajectory to reduce AT&C losses

(Figures in per cent)

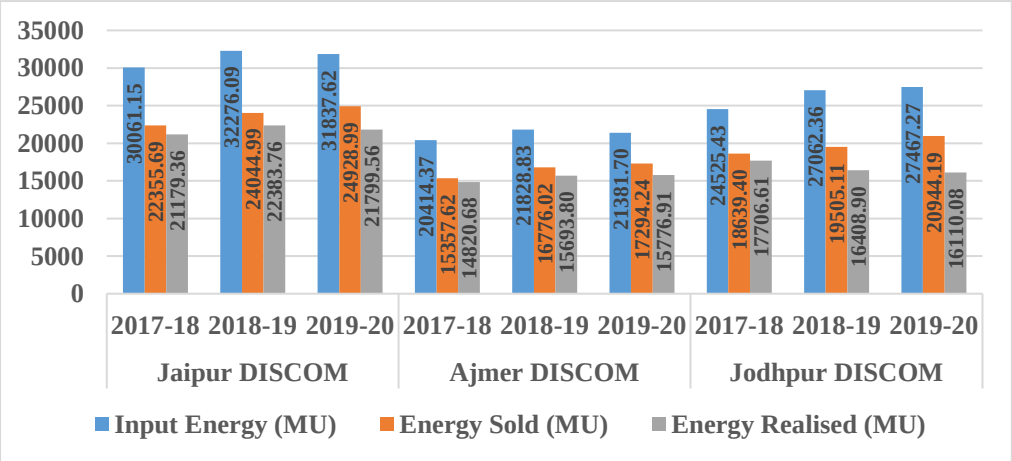
DISCOM	2015-16		2016-17		2017-18		2018-19		2019-20	
	Tar.	Ach.	Tar.	Ach.	Tar.	Ach.	Tar.	Ach.	Tar.	Ach.
Jaipur	22.50	35.74	20.50	29.84	19.00	25.22	17.50	25.66	16.00	27.61
Ajmer	18.50	27.81	17.50	25.18	16.50	22.94	15.50	23.31	14.50	21.99
Jodhpur	19.22	29.64	17.30	26.16	16.00	23.37	15.00	35.04	14.50	37.99
Rajasthan	**20.00**	**31.33**	**18.50**	**27.34**	**17.25**	**23.99**	**16.00**	**28.15**	**15.00**	**29.65**

Source: DDUGJY guidelines and Annual Reports of DISCOMs

It could be seen from the table above that the DISCOMs could not restrict the AT&C losses within the limits of trajectory approved under DDUGJY.

Capital investment under DDUGJY on feeder separation, system strengthening and metering was done with the objective to provide adequate and reliable power in rural areas and to reduce the losses correspondingly due to greater efficiency in power distribution. The details of input energy, energy sold and realised by the DISCOMs during last three years ending on 31 March 2020 are shown in chart below:

Chart No. 2.4
DISCOM wise Input energy vis-a-vis Energy sold and realised during 2017-18 to 2019-20

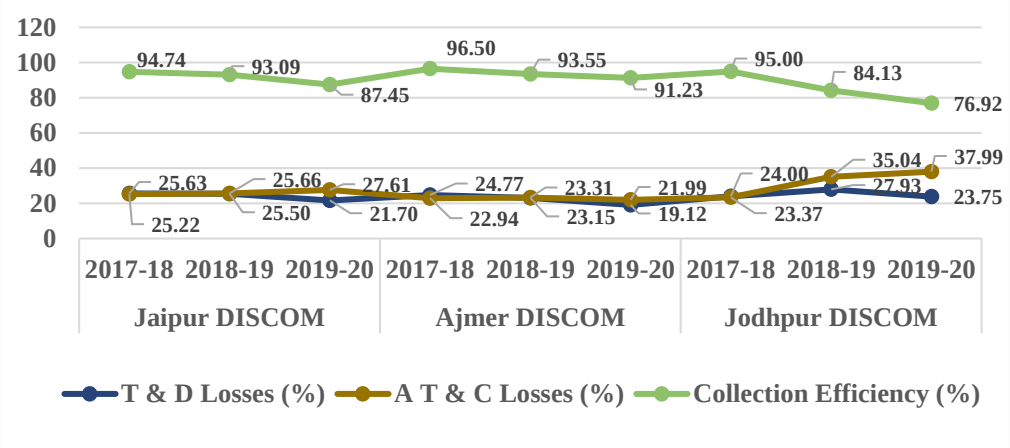


Source: Annual Accounts of DISCOMs

During the period 2017-20, the percentage realisation of input energy in Jodhpur DISCOM reduced significantly from 72.20 *per cent* to 58.65 *per cent* and in Jaipur DISCOM, it was reduced from 70.45 *per cent* to 68.47 *per cent*. In Ajmer

DISCOM, the percentage realisation of input energy improved slightly from 72.60 *per cent* to 73.79 *per cent*.

Chart No. 2.5
DISCOM wise AT&C losses during 2017-18 to 2019-20



Source: Annual Accounts of DISCOMs

It could be seen from the graph above that the collection efficiency of all the three DISCOMs had a declining trend whereas AT&C losses of Jaipur and Jodhpur DISCOMs were on an increasing trend during this period. Audit observed that none of the three DISCOMs could achieve the targets of reduction of AT&C losses which were finalised by the MoP in consultation with the concerned DISCOM. It was also observed that DISCOMs furnished (January 2020) incorrect data of AT&C losses *i.e.* reduction in AT&C losses from 30.40 *per cent* in FY 2016 to 21.30 *per cent* in FY 2019 to the Review, Planning and Monitoring (RPM) Committee. Major reasons attributable to non-achievement of targets were declining trend in collection efficiency and theft of power.

The Government stated that in Jaipur DISCOM, AT&C losses have a decreasing trend, however, still there is a gap from DDUGJY loss trajectory. Further, attempts are being made by Jaipur DISCOM to get tariff subsidy from the State Government. It further stated that AT&C losses of Ajmer DISCOM as on 31 March 2021 has been reduced to 13.73 *per cent* as against 14.25 *per cent* envisaged under DDUGJY.

The reply was factually incorrect as AT&C loss shown in the financial statements of Ajmer DISCOM for the year 2020-21 was 21.60 *per cent.*

Conclusion

Project Formulation

- DISCOMs did not prepare NAD. Resultantly, they failed to identify the need of feeder separation and critical gaps in sub-transmission and distribution network.
- DISCOMs did not carry out detailed field survey before formulating DPRs which led to wide variation in the envisaged/approved quantities of works executed.

- DISCOMs were deprived of connecting their GSS/Billing offices and other premises with optical fibre network as DPRs were not prepared though envisaged under DDUGJY.

Project Execution

- There was considerable delay in award and execution of the projects.
- The work of separation of agriculture and non-agriculture feeders was not completed despite having been taken up long back in 2008 and incurring huge expenditure in XIth & XIIth plan and under DDUGJY.
- Strengthening and augmentation of sub-transmission & distribution infrastructure work in rural areas was taken up without adhering to the prescribed parameters.
- The DISCOMs did not follow the diversity factor determined by the DISCOMs Coordination Forum (DCF) for installation of DTs and incurred an extra expenditure of ₹ 53.15 crore towards transformer capacity in excess of requirement.
- DISCOMs failed to build up a mechanism for proper energy accounting as metering at DTs and replacement of defective meters at feeders was not ensured.
- Villages were declared 100 *per cent* electrified without ensuring fulfilment of prescribed norms/parameters.
- There was an increasing trend of PDCs in BPL category consumers.
- DISCOMs failed to achieve the targets of power for all by March 2019 as well as reduction in AT&C losses as per approved trajectory.

Recommendations

DISCOMs may

- **Evolve a mechanism to identify system strengthening requirements.**
- **Formulate strategic and operational planning based on duly updated system strengthening requirements.**
- **Evolve a mechanism to conduct detailed field survey before formulating Scheme specific DPRs to identify the beneficiaries so that benefits reach intended and targeted beneficiaries.**
- **Develop a system to avoid delay in award and execution of projects.**
- **Ensure completion of the works in future projects within the stipulated time frame to achieve the intended benefits.**
- **Build up a mechanism for proper energy accounting by ensuring metering arrangement at each level.**
- **Take effective steps to reduce the AT&C losses by focussing on energy audit to curb the theft with a targeted approach.**