May 29, 2017

The Secretary
APERC,# 11-4-660, 4th Floor,
Singareni Bhavan,
Lakdi-ka-pul, Red Hills, Hyderabad – 500 004

Respected Sir
Sub: Prayas submission on 'Agriculture DSM project in eight districts of APSPDCL – OP No. 20/2017'

We appreciate APERC's efforts to hold public hearings on petitions like this. Our submission has some suggestions to improve the design and implementation of this project as well as future projects. I request you to take this on record.

Thanking you
Yours truly

Sreekumar N
Member, Prayas (Energy Group)
Email: sreekumar@prayaspune.org
405, Divya Enclave, Vijayapuri
Tarnaka, Secunderabad, 500 017

Prayas submission on 'Agriculture DSM project in eight districts of APSPDCL – OP No. 20/2017'

1. Energy Efficiency Services Limited (EESL) planned to replace 10 lakh old in-efficient agricultural pumps in 2016-17[1] and its Agriculture -DSM (Ag-DSM) programmes are at varying stages of approval in states like Andhra Pradesh, Maharashtra, and Rajasthan. This has a significant potential of reducing subsidized agricultural electricity consumption. However, the programmes should be designed such that these savings are actually achieved and sustained over time. This requires rigorous monitoring and evaluation of these programmes.
2. APERC has already approved (vide order dated 29.04.17 on O.P. No. 12 of 2017) APEPDCL's programme of replacing 35,000 5HP agricultural pumps at Rs 157.20 crore. Together with this APSPDCL's proposed programme, about 1,00,000 5HP pumps will be replaced over next year at a combined cost of about Rs. 450 crore, a significant investment. Potential savings from the programme are justified based on a pilot in Rajanagaram where 944 inefficient pumps were replaced and 30% reduction in energy consumption was reported.
3. Evaluation of savings realized from the Rajanagaram pilot needs further investigation due to following reasons:
    a. Average rating of the pumps replaced in Rajanagaram pilot was about 26 HP and 30% savings are claimed to have been realized. Savings potential for 5HP pumps may be different.
    b. The savings have been calculated based on one time measurement of consumption of individual pumps. Annual savings may differ based on quality of supply, farmer's behaviour, and seasonal variation.
    c. Savings calculated on DT and feeder level over a time period give a more reliable estimate of the realized savings. These are not available for the pilot.
    d. Finally, effectiveness of the different processes of the programmes like awareness campaigns, installation, R&M and warranty and others has not been evaluated for the pilot. This can be done only over a period of time.
4. Above limitations also apply to evaluation reports of earlier Ag-DSM programmes conducted by EESL in other places like Solapur (Maharashtra) and Hubli (Karnataka). EESL should be asked if they have measured savings at individual pumps and at DT/Feeder level over time.
5. Given the limitation of the evaluation of Rajanagaram project (as well as other pilots) and the significant potential of replacing about 15 lakh agricultural pumps in AP, we recommend that a rigorous monitoring and evaluation should be conducted for the two proposed programmes. APERC should commission an independent evaluation of both

[1] http://www.thehindubusinessline.com/news/national/eesl-to-replace-10-lakh-old-pumpsets/article8451907.ece

the programmes after a year of their implementation. No further Ag-DSM programmes should be approved till the effectiveness of the existing programmes is substantially proved over a year.

6. We provide some recommendations on conducting effective monitoring and evaluation of the proposed programmes. Three key aspects are mentioned below and elaborated in the next 3 sections:
    a. Actual installation of the energy efficient pump sets (EEPS)
    b. Actual savings from the use of EEPS
    c. Farmer's experience in availing the promised Repair and Maintenance (R&M) and warranty facilities.

7. Actual installation of EEPS:

a. According to the agreement between APSPDCL and EESL, EESL is required to submit progress reports to APSPDCL on distribution and installation status (Article 2.1 (e)). APSPDCL should ensure that EESL submits these reports and make them public, by putting them on their website.

b. APERC's order on APEPDCL's programme recognizes this issue of verification of actual installation and requires APEPDCL to conduct a preliminary enquiry if an inspection during the 5 years of R&M period finds that EEPS are not installed in the claimed location (24 (e) of O.P.No. 12 of 2017) .

c. We suggest that during the first year of implementation, APSPDCL conducts quarterly inspection drive on 10% of the EEPS installed in that quarter. APSDCL should be required to submit the findings from this inspection drive to APERC as well as put it on their website.

8. Actual savings from the use of EEPS:

a. Better baselines should be established before the programme is actually implemented. A sample of pumps can be selected to measure actual consumption, flow and other parameters like head, voltage etc. APSPDCL can identify some feeders where a sample of EEPS will be installed and their consumption can be recorded before and after installation. APERC's order (24(h) of O.P.No. 12 of 2017) requires APEPDCL to do the same.

b. As the programme is voluntary, there is a chance that some farmers may not participate in the programme. In this case, after the installation phase, DTs and feeder lines can be identified where significant replacement of old pumps has happened. As feeder line consumption is already recorded, pre and post installation values can be compared to measure actual savings, after accounting for losses.

c. EEPS are fitted with smart panels which among other things also record maximum power drawn, hours of use and energy consumed. We recommend

that an independent evaluation should be conducted after a year on a sample of pumps. The three values can be recorded to verify the projected hours of use and energy savings.

d. Additionally, these values can also be recorded during the quarterly inspection drives mentioned above. This will provide an additional data set to verify the hours of use and actual energy consumption.

9. Farmer experience with R&M and warranty process

a. R&M and warranty process is crucial to ensure that farmers use EEPS in manner that savings are realized in sustained manner. This is important since the pilot survey reports motor failures.

b. According to the agreement (article 3), APSPDCL will pay EESL every quarter which in turn will pay the vendors actually responsible for conducting R&M and warranty, and the call center agencies. We recommend that EESL provides a quarterly report of the all the R&M requests addressed in that quarter and the calls received at the call center. The report can have details of the nature of requests, action taken, and time taken to respond. APSPDCL should make this report available on their website.

10. Independent evaluation after a year:

a. In addition to all these, we suggest that APERC should commission an independent comprehensive evaluation of the two programmes after a year of implementation. This will verify the actual savings achieved by the programme as well as the effectiveness of the various processes implemented under the programme.

b. The study will rely on the quarterly reports from EESL on (a) the distribution and installation and (b) the R&M and warranty activities. It will also consider the verification reports submitted by APSPDCL every quarter.

c. The study will analyse the feeder level data to identify the savings achieved after the installation of EEPS. It will also use the additional data set on the maximum power drawn, hours of use, and energy consumed collected during the quarterly inspection drive by APSPDCL.

d. Finally, it should also conduct a study of randomly selected sample of the farmers who installed EEPS. This survey can include the following:

i. Actual values of maximum power drawn, operating hours and energy consumed during a year of the use of EEPS as recorded by the smart panels. Other details such as head, cropping pattern etc should be noted.

ii. A survey of farmers on their experience of the programme during distribution, availing warranty and other processes should be recorded.

They should also be asked if they have carried out any local repairs or re-winding.

11. It should be noted that this rigorous monitoring and evaluation process can be conducted only for these two programmes and not necessarily for subsequent programmes. Once the actual savings achieved and effectiveness of the programmes are established, subsequent programmes can be better designed and could have limited verification processes.

12. Additionally, as the plan is to replace all the 15 lakh agricultural pumps in AP, it is better to plan replacement of all (or majority) pumpsets on a particular feeder or DT in the future. This would require BEE 5 star pumps sets of different specifications – including power rating, head, pipe size and stages.

--x--