KERALA STATE ELECTRICITY REGULATORY COMMISSION

Thiruvananthapuram

Draft- Record of Discussion on Interactive Session with the Faculty of various Engineering Colleges

Venue: Court Room, Kerala State Electricity Regulatory Commission, Thiruvananthapuram

Date: 26th November, 2025 Time: 02:30 PM

List of participants: Attached as annexure

1. The Commission had conducted an interactive meeting with Director/ Principals/Deans/ HoDs and faculty members of various engineering colleges chosen by Dr. Kuncheria P Issac on November 26th, 2025. The meeting was held under the Chairmanship of Shri T.K. Jose, Chairman, KSERC.

2. The meeting was conceived by **Dr. Kuncheria P. Isaac, Former Vice Chancellor of the APJ Abdul Kalam Technological University.** The meeting commenced with self-introductions by all participants. Following this, the Chairman, KSERC, directed Shri Rajendran K. V, Secretary, KSERC, to deliver the presentation prepared from the KSERC side regarding the Commission's overview of the current state of Engineering Education in Kerala. He highlighted that the existing academic model remains heavily theory-oriented and emphasised the need for substantial improvements in engineering laboratories, along with the incorporation of more practical sessions, similar to those in the medical field. He noted the declining student interest in traditional engineering branches, further compounded by the slow pace of curriculum modernization and the rapid emergence of AI, which is reshaping job opportunities. He highlighted emerging opportunities such as:

a. Renewable Energy Technologies
    i. Solar Energy
        1. Building-integrated photo-voltaic
        2. Agri-voltaic
        3. Advances in floating solar (eg triangular shaped)
        4. Higher efficiency cells
    ii. Wind Energy
        1. Small vertical turbine design
        2. Off-shore and floating wind wills
        3. Innovations in blade materials

b. Energy Storage
    i. Battery Technologies
        1. Lithium-ion
        2. Flow batteries
        3. Solid state
    ii. Business models around grid services
        1. Virtual Power Plants (VPP)
        2. Other Ancillary Services

c. Energy Justice & Access
    i. Clean Energy
        1. Research entrepreneurial space ensuring equitable access to clean energy addressing energy poverty
    ii. Community based energy enterprise (energy start-ups)
        1. Local co-operatives
        2. Rural energy firms
        3. Community micro-grids

d. Decentralised & Community-Based Energy Systems
    i. For remote, rural or islanded regions
    ii. Peer to peer (P2P) Energy Trading

e. Innovative Business Models
    i. Energy as a Service (EaaS)
    1.Customers pay for energy services

f. Smart Grids & AI Business
    i. Smart Grids
        1. Smart-grid optimisation using AI/ML
        2. Demand forecasting
        3. Predictive maintenance

3. These developments indicate strong potential for engineering students to engage in new research, innovation, and skill-building aligned with future industry demands. At the same time, he highlighted substantial growth prospects in the energy sector and proposed the creation of Field Labs through a dedicated Business Development Programme integrated into the four-year undergraduate curriculum. The Chairman further added the setting up of following centres in the College:
   (i) Centre for Energy Studies (CES)
   (ii) Centre for Techno-preneurship Management (CTM)
   (iii) The Centre for Industry Institute Linkages (CIIL),
   (iv) The Centre for Career Counselling and Mentoring (CCCM)
   These are proposed to strengthen industry connectivity, foster practical exposure, and enhance students technical and career readiness.

4. The Chairman also proposed creating a dedicated energy consultancy in every engineering college to improve research capabilities and foster innovation in the energy sector.The insights shared served as a foundation for further discussions and the collection of suggestions from the participating engineering colleges.

5. Dr Kuncheria P Isaac noted that the idea of Institutional Social Responsibility (ISR) proposed by the Chairman is similar to the NSS. He also highlighted that although NSS provides ample scope for implementing a wide range of technical initiatives, the activities have remained largely repetitive over the years, being mostly limited to blood donation camps, cleaning drives and tree plantation drives. He emphasized the importance of developing engineers

with social commitment, capable of applying their technical expertise for societal development.

6. **Fr. Dr.Jose Kannampuzha, Director Academics, Jyothi Engineering College** highlighted the potential for effectively utilising unused wetlands and paddy fields for solar power generation. Shri. B Pradeep, Member(Technical), further elaborated on these possibilities by citing the example of West Kallada project, noting that one acre of land with a solar plant of 0.25 MWp can yield a revenue of approximately ₹13 lakh per year, and the generated energy can be fed into the grid. He also mentioned that cooperative societies could support the required investments. He further enquired whether the Commission could forward this proposal to the Government. In response, the Chairman suggested that a one-day workshop could be organised where the Minister for Co-operative Dept and Minister for Electricity could be invited to discuss the feasibility and implementation of such initiatives.

7. **Dr. Bijulal D, Principal (i/c), GEC Barton Hill**, mentioned that they are working on a proposal to deploy electric only buses in Thiruvananthapuram city. However, the charging schedule is an impediment. So they have suggested a battery-swapping system. In response, Shri. B Pradeep, Member(Technical), KSERC, enquired about the implementation approach. Dr. Bijulal explained that the system would be supported by robotic automation, enabling battery swapping at a much faster pace.

8. **Dr. S. Viswanatha Rao, Professor, Mar Baselios College of Engineering and Technology,** mentioned that they have carried out retrofitting IC engines in two-wheelers and three-wheelers. The Chairman enquired about the possibility of extending this work to four-wheelers, noting that the majority of people own cars, and emphasised the need to explore retrofitting options for them as well.

9. In response, Dr. Viswanatha Rao stated that no further advancements have been made in this area, as the current regulations do not support retrofitting of vehicles. Supporting this point, Fr. Dr. Jose Kannampuzha added that the

prevailing rules of the Motor Vehicles Department restrict such modifications, and he discussed the changes required to enable retrofitting.

10. The Chairman responded that if the feasibility is clearly demonstrated, the matter could be taken up with the Minister for Road Transport and Highways (MORTH) to amend the relevant Act. He further noted that an amendment to the Central Act could resolve the issue, and any such change would automatically be reflected at the State level in the relevant Rules.

11. The Chairman introduced a new youth entrepreneurship initiative, highlighting a hydroelectric power project with an installed capacity of 4 MW developed by six young innovators. In response to a query on whether the project is still operational, he confirmed that it is currently functioning and will continue to do so for at least another 30 years.. He also presented an image of Divya Tyagi, who redesigned the equation for wind power, demonstrating the remarkable capabilities and potential of today's youth.

12. He further cited examples of emerging entrepreneurs, such as AlphaGeek, a startup focused on improving electrical efficiency, founded by students from Mar Baselios College of Engineering and Technology and the College of Engineering Thiruvananthapuram. He also highlighted the work of Shri Zach Faizal, who launched Peec Mobility, a venture dedicated to the retrofitting of internal-combustion engines.

13. The Chairman, KSERC also initiated a discussion on various food-technology innovations. Only a few colleges currently have food-technology departments, but entrepreneurship in this field could significantly increase value-addition. e.g., producing Kerala-based premium chocolates similar to Belgian chocolates.

14. The Chairman proposed the establishment of campus industries parks where students can collaborate with companies and earn while learning. He noted that alumni can provide financial support and help connect their companies with the institution, thereby strengthening industry–institutional relations. He highlighted the example of Shri Rosh Cherian, an alumnus of Model Engineering College, Thrikkakara, who recently made a significant donation to

the college for the idea lab demonstrating the strong attachment alumni maintain with their institution.

15. He also mentioned the advancements in industrial parks, noting that one among the 31 established industrial parks has recently appointed a retired IAS Officer, as its CTO. The Chairman emphasised the need to promote entrepreneurship and explained how such initiatives can lead to the creation of more job opportunities.

16. **Dr. Chikku Abraham ,Vice Principal, Muthoot Institute of Technology and Science, Kochi** stated that they are working on the possibilities and the need for benchmarking energy consumption among MSMEs. In response, Shri. B Pradeep, Member(Technical), KSERC, opined that the EMC in collaboration with Engineering Colleges can explore this area. He also noted that benchmark is currently available for heavy industries and supported the view that similar measures for MSMEs could be expedited through collaboration with various engineering colleges. He also raised a concern regarding programmes such as One District One Industry (ODOI), in which they had participated and were selected, but no further progress has been made since then. Faculty members from other colleges supported this point, noting that several initiatives and programmes often halt midway and do not progress as initially planned.

17. **Shri. Akshay Raj M R , Assistant Professor, Rajadhani Institute of Engineering and Technology**, presented an innovation developed by their students, involving drones capable of detecting humans during landslides and sea rescue operations. He added that they are currently working on implementing the prototype and are also exploring the possibility of incorporating long-duration batteries to enhance drone performance.

18. Shri. B Pradeep, Member(Technical), KSERC, noted that drones can have significant applications in the power sector as well, such as the maintenance of HT/LT lines using insulated drones for hot line maintenance. This approach eliminates the need for human intervention in hazardous conditions and reduces the requirement for power interruptions.

19. Shri Akshay Raj M R concluded by stating that the institution is promoting mechatronics as an emerging area, recognising the declining interest in certain traditional engineering branches.

20. The Chairman mentioned emerging battery technologies and how recent advancements are contributing to a decline in battery costs. He highlighted innovations such as iron-based batteries, which are cheaper than lithium-ion and lead-acid batteries, and also referred to zinc–graphene batteries, which offer greater stability compared to other technologies. He further pointed out the development of new catalysts with high energy density. Additionally, he referred to the innovative work on iron batteries by Dr. Arun, who is currently pursuing his PhD at Stanford University and is an alumnus of NIT Surathkal and MIT, as well as the work on zinc–graphene batteries by Dr. V. T. Joy, retired Assistant Professor and Head of the Chemistry Department at Christ College.

21. **Shri A G Mathew, Principal, St. Thomas Institute for Science and Technology, Thiruvananthapuram,** presented their innovations on producing biodiesel using waste cooking oil from hotels and water hyacinth. He also noted that they have secured a patent for the manufacture of biopaper from water hyacinth.

22. However, Fr. Dr. Jose Kannampuzha raised concerns about the technical limitations of this approach and enquired about its viability. In response, A. G. Mathew stated that the process is indeed viable and that they are also exploring opportunities to expand the business and trading of biodiesel.

23. The Chairman, KSERC, supported the idea and noted the abundance of water hyacinth as a readily available raw material. He further added that technical improvements and the chosen approach should be carefully evaluated. Shri Kuncheria P Issac also highlighted that these are areas where techno-entrepreneurship plays a significant role.

24. The Chairman also highlighted the possibility of conducting an entrepreneurship fest at the college level, bringing together alumni entrepreneurs, entrepreneurs from alumni families, and entrepreneurs from

the local catchment area. He noted that alumni can become a strong pillar of support for the institution. He stressed the importance of conducting such events regularly to strengthen the alumni network and emphasised the potential for initiating project funding through contributions from these members. He added that entrepreneurship should be actively promoted by encouraging student innovation, establishing incubation centres, providing mentorship, and facilitating opportunities for skill development. He further highlighted the transformative changes that colleges can bring when empowered with autonomous status.

25. The Chairman also mentioned the possibility of providing consultancy support from colleges. He noted that there is currently a shortage of consultants in the electrical field and highlighted the potential for engaging young retired professionals to bridge this gap. He added that adopting this approach by charging a consultation fee would also help institutions generate an additional source of income.

26. The Chairman also noted the concern raised regarding the need for improved interaction with industries. He further added that data centres are highly power-intensive and emphasised the importance of developing technologies to optimise their power quality ,reliability and energy consumption.

27. Shri Kuncheria P Issac stressed that the discussions held should lead to concrete progress and that clear outcomes should be developed from them. He also proposed creating a WhatsApp group for all participants so that connections can be maintained and further ideas and updates can be shared.

28. The Chairman added that if any communication or letter needs to be submitted to Management authorities of the Institute, the Commission would facilitate the same.

29. Ms. Arya P R, Intern KSERC, proposed vote of thanks.

30. The meeting was concluded at 6:15 PM.

(Any further suggestions, ideas or opinions are most welcome.

Annexure

List of participants attended the meeting

1. Shri. T. K Jose, Chairman, KSERC
2. Adv. A. J Wilson, Member (Law), KSERC
3. Shri. B Pradeep, Member(Technical), KSERC
4. Dr. Kuncheria P Isaac, Former Vice-Chancellor, APJ Abdul Kalam Technological University.
5. Shri. Rajendran K V, Secretary, KSERC
6. Shri. Shine T A, PR, KSERC
7. Shri. Mohanakumar B V, Consultant Technical II, KSERC
8. Shri. Sarmakumar C S, Consultant Engineering, KSERC
9. Shri. Bhuvanendra prasad, Compliance Examiner, KSERC
10. Shri. Sharon Shaji, Consultant System Administrator, KSERC
11. Dr Vinod V P, HOD EEE, Sree Buddha College of Engineering, Alappuzha
12. Dr M D Mathew, Associate Provost & Dean Research, Saintgits College of Engineering (Autonomous), Kottayam
13. Dr Lillykutty Jacob, Principal, Amal Jyothi College of Engineering, Kottayam
14. Shri. Ramkumar S PhD, Principal, Sahrdaya College of Engineering and Technology, Thrissur
15. Dr. S.Viswanatha Rao, Professor,Mar Baselios College of Engineering Technology, Thiruvananthapuram
16. Dr.Elizabath Varghese ,HOD EEE, Mar Baselios College of Engineering Technology, Thiruvananthapuram
17. Dr. Chikku Abraham ,Vice principal, Muthoot Institute of Technology and Science, Kochi
18. Shri. Victor Jose, Assistant Professor, Amal Jyothi College of Engineering Kottayam
19. Dr. Sreekala P, Associate Professor, Amal Jyothi College of Engineering Kottayam
20. Dr.Mahendran N, Professor, EEE, Saintgits College of Engineering (Autonomous), Kottayam
21. Dr. Bijulal D , Principal (i/c), GEC Bartonhill, Thiruvanathapuram

22. Dr.Madhukumar S, Principal, Rajadhani Institute of Engineering and Technology, Thiruvanathapuram
23. Fr. Dr.Jose Kannampuzha, Director Academics, Jyothi Engineering College, Thrissur
24. Dr. Shijoh V, Professor & HOD, Jyothi Engineering College, Thrissur
25. Shri.R Harikumar, Professor & HOD, EEE, Marian Engineering College Thiruvananthapuram
26. Dr. M Manoj , Professor & HOD ECS, Marian Engineering College, Thiruvananthapuram
27. Anto Manuel, Associate Professor & HoD, BME,Rajadhani Institute of Engineering and Technology, Thiruvananthapuram
28. Shri.Sreesh P R, Assistant Professor, CSE (AI/ML), Rajadhani Institute of Engineering and Technology, Thiruvananthapuram
29. Shri. Akshay Raj M R , Assistant Professor, CSE (AI/ML), Rajadhani Institute of Engineering and Technology, Thiruvananthapuram
30. Dr. A G Mathew , Principal, St Thomas Institute for Science And Technology, Thiruvananthapuram
31. Shri. Rinu Sarah Mathews, Associate Professor & HoD, EEE, St Thomas Institute for Science And Technology, Thiruvananthapuram