

F.No. 12(27)/2015-AEI
Government of India
Ministry of Heavy Industries & Public Enterprises
Department of Heavy Industry

Dated the 23rd November 2017

OFFICE MEMORANDUM

Subject: Minutes of the 8th meeting of Project Implementation and Sanctioning Committee (PISC) held at 11 AM on 1st November 2017 at Udyog Bhawan, New Delhi – Forwarding of.

The undersigned is directed to forward minutes of the 8th meeting of Project Implementation & Sanctioning Committee (PISC), which was held on 1st November 2017 at Udyog Bhawan, New Delhi, for information and necessary action.

2. This issues with approval of the competent authority.

Encl: As Above.



(Ajay Kumar Gaur)

Under Secretary to the Government of India

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To

श्री अजय कुमार गौर, Under Secretary to the Government of India
अधीन सूचना सचिव, नई दिल्ली
अधीन सूचना सचिव, नई दिल्ली
Ministry of Heavy Industries & Public Enterprises
अधीन सूचना सचिव, नई दिल्ली
श्री अजय कुमार गौर, नई दिल्ली-110011
Udyog Bhawan, New Delhi-110011

All members of the PISC/Special Invitees (as per list enclosed).

Copy to:-

1. Pr.SO to SHI
2. Sr.PPS to AS&FA (Heavy Industry)
3. PPS to JS (VS).
4. Director (SKS).
5. Sr.DO(NLG)

To

1. Shri Abhay Damle, Joint Secretary
Ministry of Road Transport & Highways
Transport Bhawan
New Delhi-110001.
2. Smt. Rashmi Urdhawaresha, Director
Automotive Research Association of India (ARAI)
Survey No. 102, Vetal Hill, Off Paud Road, Kothurd
Pune – 411004.
3. Shri Vishnu Mathur, Director General
Society of Indian Automobile Manufacturers (SIAM)
Core 4-B, 5th Floor, India Habitat Centre, Lodhi Road
New Delhi-110003.
4. Shri Vinnie Mehta, Director General
Automotive Component Manufacturers Association of India (ACMA)
6th Floor, The Capital Court, Old Palme Marg, Munirka
New Delhi-110067.
5. Shri Sohinder Singh Gill, Director
Society of Manufacturers of Electric Vehicles (SMEV)
50, Okhla Industrial Estate – III
New Delhi-110020

Special Invitees

6. Dr. G.Sundararajan [Chairman (IM-TAG)], Professor, Materials & Metallurgical Engineering, IIT Madras.
7. Ms Neeti Sarkar, Director (Admn & Finance), NATRIP.
8. Shri Sajid Mubashir, Member-Secretary (IM-TAG), Scientist G, Department of Science & Technology.

MINUTES OF THE 8TH MEETING OF PROJECT IMPLEMENTATION & SANCTIONING COMMITTEE UNDER FAME INDIA SCHEME

1. A meeting of the Project Implementation & Sanctioning Committee (PISC) under the chairmanship of Secretary (Heavy Industry) was held at 11 AM on 1st November 2017. List of the participants is at **ANNEXURE-I**.

2. At the outset, Joint Secretary (Auto), D/o Heavy Industry welcomed the participants and briefed about the agenda of the meeting. He stated that this is the first meeting of PISC where only technology related proposals are to be considered after recommendations of the Technology Platform for Electric Mobility (TPEM). JS (Auto) further stated that the following project proposals, received under Technology Development as recommended by Technology Platform for Electric Mobility (TPEM), are to be considered by the PISC:

- (1) Development of DC Charging Technology for Low Voltage Electric Vehicle.
- (2) Technology Pilot for DC Charging for EV Bus
- (3) Development and Prototyping of ICT enabled Smart Charging Network Components
- (4) Development of Indian Urban Driving Cycles for xEV
- (5) HUB and SPOKE consortium for e-2W and e-3W Electric Drives
- (6) Switched Reluctance Traction motor and controller for 2W & 3W
- (7) Synchronous Reluctance Motor Drive for Indian Electric Vehicle applications

He then requested Secretary (Heavy Industry)/Chairman of PISC to make his opening remarks.

3. Welcoming participants in the meeting, Secretary (Heavy Industry) mentioned that participation of industry and academia is good for new technology areas to be developed. He hoped that projects are correctly identified and emphasized the need to add capability based on the work done by the system.

4. Joint Secretary (Auto), DHI thereafter invited Dr. G.Sundararajan, Co-chairman, IM-TAG for addressing the meeting. Dr. Sundararajan mentioned that

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rigorous exercise was done by the different sub-groups under IM-TAG. After detailed examination of the 105 proposals received under Technology Platform, 7 proposals were finally recommended for consideration by this committee.

5. Joint Secretary (Auto) briefed about the setting up of Technology Platform for Electric Mobility (TPEM) under National Mission on Electric Mobility on 01-02-2016 and the Inter-ministerial Technology Advisory Group (IM-TAG) formed to guide the activities of TPEM under NMEM and FAME India Scheme. He further detailed about the procedure followed and activities undertaken by the TPEM in analyzing the proposals received against call for proposals under Technology Platform.

6. Subsequently, the proposers were invited to make a brief presentation of their proposal before the Committee.

6.1 Project No. 1: Development of DC Charging Technology for Low Voltage Electric Vehicle.

Principal Investigator : CDAC, Trivandrum
Industry Partner : BHEL Electrical Machines Ltd., Kasaragod
Budget : Total=Rs. 92 Lakh

[DHI Share: Rs. 55.21 Lakh and Partners Share= Rs. 36.79 Lakh]

6.1.1 OBJECTIVE

(a) To design, develop, and demonstrate a 3.3kw isolated Battery Charger (BC) for Low Voltage Electric Vehicles using Wide Band Gap Devices (WBG) power switches. The objective of the design is to achieve high efficiency, where battery chargers will be smaller in size and weight as compared to commercially existing Silicon based BC products.

6.1.2 DISCUSSION

(a) The committee was informed that this project is for designing & developing a 3.3 KW isolated Battery Charger (BC) for Low Voltage Electric Vehicle, with the overall objective of achieving efficiency by having smaller in size and weight battery charger.

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(b) Committee enquired about the time taken for charging and whether it is at par with time taken by existing chargers. The committee also sought to know the advantages of this technology over the existing technology. It was informed that for 60 AH battery it would take around 3-3.5 hrs. The benefit of this technology over the existing technology was explained to the committee. It was informed that the WBG based switching power transistors can operate at high voltages with much higher performance and lower losses than previously used Silicon transistors.

(c) Committee also asked as to how industry would be benefitted by this and as to how the market react to the product with this charging time. The industry representative present in the meeting responded that for a large fleet, these slow chargers will not work.

(d) Chair mentioned that it is to be seen if all other parameters remain the same, how this technology would compete with other available technologies. The goal of this project needs to be justifiable and should clearly define the parameters on which this technology is better than the available technologies. The committee further observed that there is a need to enhance the performance of charger. Moreover, if the cost of the project is enhanced, then the balance funding should come from the industry. The project also needs to conform to charging protocols. They were advised to purchase a minimum number of batteries and validate their chargers with respect to charging time.

6.1.3 RECOMMENDATION

(a) It was decided that a revised proposal would be drawn up considering the observations made by the Committee.

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6.2 Project No. 2: Technology Pilot for DC Charging for EV Bus

Principal Investigator : Panva Engineering Pvt. Ltd., Nasik, Maharashtra
Co- Principal Investigator : K.K.Wagh Institute of Engineering Education and
Research, Nasik, Maharashtra

Budget: Total=Rs. 150.80 Lakh
[DHI Share: Rs. 90 Lakh and Partners Share= Rs. 60.80 Lakh]

6.2.1 OBJECTIVE

(a) To Design High Power DC Chargers for EVs ranging from 500 to 800 V systems.

6.2.2 DISCUSSION

(a) It was informed that the objective of this project is to develop high power DC chargers ranging from 500V to 800 V range for electric buses. It would be an indigenous & fully in-house development designed for Indian environmental conditions. The duration of this project was stated to be 2 years.

(b) Committee questioned the long duration of the project and asked the proposers to make efforts for shortening the project period.

(c) The committee observed that the project is useful for promotion of electric buses as well as to set regulatory mechanisms. The project should also look into the aspects of chargers to grid communication. The committee, however, observed that the lead partner should be the Institution (Institution of Engineering Education and Research, Nasik, Maharashtra) and the industry should be co-partner. There should be a MoU clearly mentioning the costing and the share of industry/academia before release of the fund to the Institution. The manpower aspects like charging for faculty etc should be revisited.

6.2.3 RECOMMENDATION

(a) The Committee, in principle, approved the project subject to meeting out the following observations made during the deliberation -

- I. Lead Partner should be Institution.
- II. Shortening the duration of the Project.
- III. Scope of Charger-Grid Communication to be included.
- IV. MoU between Institution and Industry partner.
- V. The financials like charging for faculty should be revisited.

6.3 **Project No. 3: Development and Prototyping of ICT enabled Smart Charging Network Components**

Principal Investigator : IIT Delhi
Co- Principal Investigator : Thapar University, Amrita Vishwa Vidyapeetham,
Lithium Urban Technologies
Industry Partners : Elecsys Technologies Pvt. Ltd., Engie (GDF Suez
Energy) , Linkwell Telesystems , Yexcube
Technologies

Budget: Total=Rs. 1001.76 Lakh .
[DHI Share: Rs. 598.73 Lakh and Partners Share= Rs. 403.03 Lakh]

6.3.1 OBJECTIVE

(a) To design a bidirectional Electric Vehicle Supply Equipment (EVSE) for residential and public charging stations, alongwith development of algorithms, net-metering, communication, architecture etc.

6.3.2 DISCUSSION

(a) IIT Delhi presented the project and stated that the project is led by IIT, Delhi with academia partners [Thapar University, Amrita University) and industry partners [Lithium Urban Technologies, Elecsys Technologies, Engie (GDF Suez Energy), Linkwell Telesystems, Yexcube Technologies]. The Committee was informed that this project intends to design a bi-directional EVSE for residential and public charging stations. At present , there is no bi-directional charger in India. This would develop

contd./-

Protocol for communication for charger to grid and grid to charger. It would also develop net-metering for monitoring, supervisory control and data storage in Vehicle to Grid (V2G) environment. This project will help in setting up of Central Server with necessary software, involving: Integration of electric utility, Facilitating Demand Response / Dispatch & Dynamic pricing based export/import tariff. Also, it will develop cloud based software applications for EV users and EV fleet operators. This is mainly a learning project. Amrita University is developing open source software.

(b) Committee enquired about the costing of the project and share of the industry/academia partners in this project.

(c) The committee was informed that the total project cost is Rs. 1001.76 lakh. Out of this, the Government grant sought for Rs. 598.73 lakh with the remaining Rs. 403.03 lakhs to be shared by industry/academia partners. The Industry/academia partners should put the money prior to release of funds by Government.

(d) The Chair asked for the status of software acquired for the project and IPR related issues from the proposers. It was informed that the software would be hired only for the duration of the project period. The IPR should be opened up after 2 years. The deliverables are to be clearly spelt out.

6.3.3 RECOMMENDATION

(a) The Committee, in principle, approved the project subject to meeting out the following observations made during the deliberation:-

- I. The Industry/academia partners should put the money prior to release of funds by Government. The release would be proportionate.
- II. The IPR should be opened up after 2 years.
- III. The deliverables to be clearly spelt out.

6.4 **Project No. 4: Development of Indian Urban Driving Cycle for xEV**

Principal Investigator : IIT Madras [Department of Electrical Engineering/
Computer Science & Engineering/Civil Engineering
Engineering], IISc Bangalore (Department of Civil
Engineering)

contd./-

Industry Partners: Mahindra Electric; Bosch Limited, Bangalore; Robert Bosch Engineering & Business Solutions Pvt. Ltd., Coimbatore

Budget: Total=Rs. 692.91 Lakh
[DHI Share: Rs. 456.37 Lakh and Partners Share= Rs. 236.54 Lakh]

6.4.1 OBJECTIVE

(a) To develop driving cycle for xEV in Indian conditions through deployment of xEV in real-world conditions

6.4.2 DISCUSSION

(a) This project is led by IIT, Madras with other academia partners [Indian Institute of Science, Bangalore] and industry partners [Mahindra Electric, BOSCH Ltd., Bangalore, Robert Bosch Engineering and Business Solutions Pvt. Ltd., Bangalore]. During the presentation, it was informed that the duration of this project is 3 years and the year-wise deliverables of this project would be –

Year 1: Establish the platform for data acquisition and storage. Verification and validation of the technology platform by running a pilot project with 2-wheeler, Passenger car and LCV in Bangalore. Fabricate xEV data collection.

Year 2: Increase deployment on vehicles to approximately 25 per each segment considered across Bangalore, Mumbai, Chennai and Delhi. Derive intermediate results based on acquired data. Deploy xEV in real-world conditions based on experimental design.

Year 3: Development of driving cycle, consolidation of findings from the project and presentation of results.

(b) Though the project was found to be useful, the committee observed whether industry would be comfortable with this timeline. The question is about the utility of data, which may become redundant after 3 years.

(c) Committee also observed that the proposer should try to compress the timeline as new models are likely to be in the market by then.

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(d) The representative from ARAI submitted that the industry itself is doing similar study, but their data is not shared. Therefore, it would be useful to have this project to generate data in public domain.

(e) Committee suggested that the lead partner should have interface with ARAI in this project and try to compress duration of the project to one year. Further, this study has to be integrated with regulatory requirement and has to be done for different ratings of batteries and as per the requirement of the industry. Re-examination of the financials of the project was advised. ARAI should help in choosing the vehicles for the study.

6.4.3 RECOMMENDATION

(a) The Committee, in principle, approved the project subject to meeting out the following observations made during the deliberation:-

- I. Compress the timeline
- II. The scope of the study should include regulatory requirements and consider different rating of batteries
- III. Re-examination of the financials of the Project
- IV. Involvement of ARAI in the project

6.5 **Project No. 5: HUB and SPOKE consortium for e-2W and e-3W Electric Drives**

Principal Investigator: TVS-Lucas Limited; NFTDC, Hyderabad
Institutions : IIT Guwahati; IIT Jodhpur; IIT BBSR; VIT Chennai;
NITTEE, Surathkal
Industry Partners: Lucas TVS, Chennai; Ampere Vehicles, Coimbatore;
Electrotherm; Lohia Auto Industries
Budget: Total=Rs. 369.10 Lakh
[DHI Share: Rs. 297.10 Lakh and Partners Share= Rs. 72 Lakh]

6.5.1 OBJECTIVE

(a) Design, develop and render prototypes of two types of non Permanent Magnet motor drives, viz, Advanced IM and Synchronous Reluctance for e2W and e-3W based on actual drive cycles for such vehicles in Indian metros and Tier-I towns.

contd. /-

6.5.2 DISCUSSION

(a) The Committee was informed that this project is for designing, development and for prototyping of advanced IM and Synchronous Reluctance Drives and vehicle integration for e2W and e-3W vehicle Applications. Through this project, they will design and develop permanent magnet free motors for light duty vehicles in the 2W and 3W category. It would manufacture prototype as well as have integration with the vehicles and evaluate road performance. The project is for 2 years period. The consortium comprised NFTDC, Hyderabad; IIT, Guwahati; IIT, Jodhpur, IIT, Bhubaneswar; VIT, Chennai and from industry side, TVS-Lucas Ltd.; Ampere Vehicles, Coimbatore; Electrotherm; Lohia Auto Industries.

(b) Committee observed that there is a need to look into the project from budget angle and other cost involved in this project. This may be seen by Director (F&A), NATRIP.

6.5.3 RECOMMENDATION

(a) The Committee, in principle, approved the project subject to examination of the same by Director (F&A), NATRIP from budget and other costs involved therein. Committee directed that one of the institutions should lead the project and industry should be partners. As in other cases, there would be proportionate release of funds by DHI after industry puts in the money first.

6.6 **Project No. 6: Switched Reluctance Traction motor and controller for 2W & 3W.**

Principal Investigator: Aditya Auto Products & Engg. (I) Pvt. Ltd.; NITK Surathkal
Industry Partners: Hero Eco; Ampere Vehicles Pvt. Ltd.

Budget : Total=Rs. 2019.99 Lakh

[DHI Share: Rs. 1325.26 Lakh and Partners Share= Rs. 694.73 Lakh]

6.6.1 OBJECTIVE

(a) To prove the performance for 4 target implementations [Torque (Nm) Continuous, Speed (RPM) Max., Power (kW) Peak & Power (kW) continuous] with respect to the Brushless Direct Current (BLDC) and Induction motor technologies.

6.6.2 DISCUSSION

(a) The committee was informed that there is a need to develop both Hub motor or inner rotor configuration for 2W & 3W EV in order to cater to all segments and in a wide range of torque and power capabilities in order to make electric mobility the primary choice. This project is to prove the performance in the 4 target implementations with respect to the BLDC and Induction motor technologies. The project would involve 1) Custom design and packaging; 2) Co-simulation and virtual prototyping; 3) Prototype build and validation and 4) Optimized build and testing.

(b) The project is led by Aditya Auto Products & Engg. (I) Pvt. Ltd. and have academia partner as NITK Surathkal with other industry partners [Hero Eco and Ampere Vehicles Private Limited] in this consortium. The duration of the project is 3 years. It was informed that deliverables of the project would be four market ready motors.

(c) The Committee observed that the consortium requires to be restructured with academia as the lead partner. There is a need to revisit the financials and cost sharing arrangement.

6.6.3 RECOMMENDATION

(a) The Committee, in principle, approved the project subject to meeting out following observations made during the deliberation as following:-

- I. Academia should be lead partner
- II. Need to revisit the financials and cost sharing arrangements

6.7 **Project No. 7: Synchronous Reluctance Motor Drive for Indian Electric Vehicle applications**

Principal Investigator: IIT Madras

Industry Partners : Mahindra Reva Electric Vehicles Ltd., Bengaluru.

Budget : Total=Rs. 261.35 Lakh

[DHI Share: Rs. 169.10 Lakh and Partners Share= Rs. 92.25 Lakh]

contd./-

6.7.1 OBJECTIVE

- (a) Design of a cost effective, efficient and compact SynRM drive system for Indian 3 wheeler applications.
- (b) Indigenous manufacturing of prototypes and component level validation.
- (c) Vehicle level validation and demonstration (ARAI testing).

6.7.2 DISCUSSION

(a) This project is led by IIT, Madras with industry partners as Mahindra Reva Electrical Ltd., Bengaluru. IIT, Madras informed that they were concentrating on 3W of M&M for the development of motors. The presentation was made by IIT, Madras. It was informed that the duration of the project is 3 years with a total budget of Rs. 261.35 Lakh. They have sought grant from the Government to the tune of Rs. 169.10 lakh and the academia/industry contribution would be Rs. 92.25 lakhs.

(b) Committee desired to know the reasons for supporting these 3 proposals related to Motors. Committee observed about long time line and costing of the project with budget sharing. Some clarity needs to be there for financing from the industry.

(c) Dr. G Sundararajan, Co-chairman, IM-TAG clarified that the three proposals pertaining to EV motors were selected for funding under the scheme are -

- (1) Switched Reluctance Motor (SRM) - By Aditya Auto
- (2) Synchronous Reluctance Motor (SyRM) - Lucas TVS
- (3) Hybrid Synchronous Reluctance Motor (H-SyRM)- IIT, Madras

All the current EV manufactures worldwide are using induction motors and permanent magnet motors. In the recent years, two types of motors have emerged for EV applications i.e., Switched Reluctance Motor (SRM) and Synchronous Reluctance Motor (SyRM), primarily because of the advances in power electronics which allow for sophisticated control & monitoring of the characteristic of the motors. All the experts in the area of motors are unanimous that SRM & SyRM motors are the future for EVs. Since SRM and SyRM motors are not yet inducted into service by EV manufacturers, working in the development of these motors will allow India to be at least current in the global context. Thus, there is a clear need to encourage motor

development in this area. Both SRM and SyRM are comparable in terms of performance and which of them will be the motor of the future will depend on how fast the bugs and problems are overcome and of course on the cost. At present, development of SRMs has gone up to the stage of prototype development while the development of SyRM is still at the lab scale. Hence, there is a clarity in respect of proposal (1) & (2) mentioned above.

(d) Dr. Sundararajan further informed that the third proposal of IIT, Madras is to develop a minor variant of SyRM designated as H-SyRM. The hybrid synchronous machine makes use of a similar structure like that of a SyRM, but uses an auxiliary source of excitation on the rotor in the form of magnets. These are not rare earth magnets, but rather of ferrite. This magnet assistance enables the machine to provide better torque than a simple SyRM, and hence better performance. The challenge would be to design good rotor structure, which can house magnets, be suitable for manufacture and extract maximum performance possible with this combination. He opined that development of SyRM requires greater effort than that of SRM and also considerable more modelling and computational effort. Development of Hybrid SyRM (IIT, Madras) requires even greater research, modelling and manufacturing efforts.

(e) For the above reasons, Dr. Sundararajan expressed that it makes sense to support all the 3 projects in the area of motors for EV.

6.7.3 RECOMMENDATION

(a) The Committee, in principle, approved the project subject to further working on timeline and the costing involved in the project.

7. Subsequently on enquiries from participants for maintaining account of fund to be released by the Government through this scheme, Secretary (Heavy Industry) observed that there is a need to look into the accounting procedure; In-kind contribution; Capital Assets creation; Proper MoU with milestone based payments, clarity in structuring institutional overheads etc. He suggested AS&FA, DHI may separately look into these aspects to develop common guidelines or clauses to be adopted.

contd./-

8. In addition to above stated TPEM proposals, the following proposals were also discussed during the meeting with the permission of chair –

8.1 Proposal of Electrotherm (India) Ltd. for inclusion of Carbon Foam Batteries in Advance Battery Category under FAME India Scheme of the Government.

(a) The Committee appreciated the efforts put in by M/s Electrotherm (India) towards innovation. The Committee went through the definition of Advanced Battery in the FAME notification. The same was read out as below:-

“Advance Battery represents the new generation batteries without lead such as Lithium Polymer, Lithium Iron phosphate, Nickel Metal Hydride, Zinc Air, Sodium Air, Nickel Zinc, Lithium Air etc.”

(b) After deliberation on the proposal, the committee felt that since carbon foam battery of Electrotherm contains lead, it would not be possible to include it in the category of advanced battery as per definition given in the FAME India Notification. Further, with FAME Scheme extension being available only upto 31st March 2018, there may not be much to gain by including Carbon Foam Batteries within the definition of Advance Battery at this stage.

8.2 Hiring of one eVerito Electrical Vehicle for DHI.

(a) Since this proposal had already been concurred by IFW (DHI) and approved by Secretary (Heavy Industry) and have not come up in the earlier meeting of PISC for ratification, the Committee granted post-facto approval to the proposal of Department of Heavy Industry for hiring of one eVerito for a period of one year w.e.f. 21/12/2016 i.e. upto 20/12/2017.

9. To summarise, after detailed deliberation on the agenda of the meeting, following decisions were taken in the meeting:-

(a) Project No. 1: Light Weight EV Fast Charging have to be re-submitted by the proposer after further study as per observations of the committee detailed in Para 6.1 above.

contd./-

- (b) Project No. 2 to Project No. 7 have, in principle, been approved by the Committee subject to suggestions made in the respective para no. 6.2 to .6.7. These are further subject to further examination by Director (Fin & Admn), NATRIP from the following angles :-
- (i) Financial Scrutiny of the proposals;
 - (ii) Drawing up a standard operating procedure for financial management of assets, IPR issues, Disbursement of funds etc. in the implementation of projects.
- (c) In all projects, it was agreed that industry should put the money in first followed by DHI giving proportionate grants. Further, wherein IPRs are generated, the same would be opened up 2 years after the completion of the project. MoU's required to be signed between DHI and the lead institution and between the institution(s) and the industry partners.
- (d) Proposal of Electrotherm as mentioned at Para 8.1 has not been agreed to by the Committee.
- (e) Proposal for hiring of one eVerito EV for the Department of Heavy Industry for a period of one year beyond. 21/12/2016 and upto 20/12/2017 has been granted post-facto approval by the Committee [Para 8.2].
- (f) On the issue of maintaining account of the grant released by the Government and other issues related to In-kind contribution; Capital Assets creation; Proper MoU with milestone based payments, clarity in structuring institutional overheads etc., it was suggested that AS&FA, DHI may separately look into these aspects to develop common guidelines or clauses to be adopted [Para 7].
10. Summary statement of proposals, their financials and Committee's view on the proposals is at **ANNEXUE-II**.

List of Participants

(8th PISC Meeting held on 01.11.2017)

Members/Officials:

1. Dr. Asha Ram Sihag, Secretary(HI) - In Chair
2. Dr. Subhash Chander Pandey, AS&FA(DHI)
3. Shri Vishvajit Sahay, Joint Secretary(Auto)
4. Shri Sunil Kumar Singh, Director(Auto)
5. Shri Anand Deshpande, ARAI
6. Shri P.K. Banerjee, Dy. Executive Director, SIAM
7. Shri Alok Ray, SMEV
8. Shri Mukul Mathur, SMEV
9. Shri N.L. Goswami, Sr.Dev. Officer(DHI)
10. Shri Ajay Kumar Gaur, Under Secretary (DHI)
11. Shri R.P. Sharma, Consultant(NAB)

Special Invitees:

12. Dr. G. Sundararajan, Chairman (IM-TAG)
13. Ms. Niti Sarkar, Director, NATRiP-Spl. Invitee
14. Shri Sajid Mubashir, Member Secretary (IM-TAG) -DST

Invitees:

15. Dr. K. Balasubramaniay, Director, NIFTDC
16. Shri Jagdish Bagre, Hero Electric
17. Shri Sukumar Mishra, IIT Delhi
18. Shri Joy Nandi, Head-NCR, Lithium Urban Technologies
19. Prof. D.M. Chandwadkar, Prof.& Head, KK Wagh Institute of Engg Edn & Research, Nasik
20. Dr. Sunita Patil, Associate Professor, KK Wagh Institute of Engg Edn& Research, Nasik
21. Shri Ajintya Joshi, Director, Panva Engg. Pvt. Ltd., Nasik
22. Shri K. Srinivas, GM(R&D) Aditya Auto
23. Shri Mihir Jayaraman, Aditya Auto
24. Shri Imron Mansury, BHEL
25. Dr. S. Srinivas, Associate Professor, IIT, Madras.
26. Dr. Gitakrishnan Ramadurai, Associate Professor, IIT Madras
27. Dr. Praveen Kumar, IIT Guwahati
28. Shri N.S. Ramanathan, Head-Advanced Engg., Lucas TVS Chennai
29. Shri V. Chandrasekhar, Joint Director, CDAC
30. Dr. Mukesh Singh, Associate Professor, Thapar University
31. Shri Mukesh Bhandari, Firefly- Electrotherm (India) Ltd.,
32. Shri B.K. Vaishya, Electrotherm (India) Ltd.,
33. Shri Ajay Kumar, Electrotherm (India) Ltd.,

ANNEXURE-II

S.No.	Project/ Proposal	Institute/ Agency	Project Budget (Total)	Grant Sought from Department	Decision of the Committee
1.	Development of DC Charging Technology for Low Voltage Electric Vehicle	<u>Principal Investigator</u> CDAC, Trivandrum <u>Industry Partner</u> BHEL Electrical Machines Ltd., Kasaragod	Rs.92.00 Lakh	Rs. 55.21 Lakh	It was decided that a revised proposal would be drawn up considering the observations made by the Committee.
2.	Technology Pilot for DC Charging for EV Bus	<u>Principal Investigator</u> Panva Engineering Pvt. Ltd., Nasik, Maharashtra <u>Co- Principal Investigator</u> K.K.Wagh Institute of Engineering Education and Research, Nasik, Maharashtra	Rs. 150.80 Lakh	Rs. 90 Lakh	The Committee, in principle, approved the project subject to meeting out the following observations made during the deliberation - <ol style="list-style-type: none">I. Lead Partner should be Institution.II. Shortening the duration of the Project.III. Scope of Charger-Grid Communication to be included.IV. MoU between Institution and Industry partner.V. The financials like charging for faculty should be revisited.
3.	Development and Prototyping of ICT enabled Smart Charging Network Components	<u>Principal Investigator</u> IIT Delhi <u>Co- Principal Investigator</u> Thapar University, Amrita Vishwa Vidyapeetham, Lithium Urban Technologies <u>Industry Partners</u>	Rs. 1001.76 Lakh	Rs. 598.73 Lakh	The Committee, in principle, approved the project subject to meeting out the following observations made during the deliberation:- <ol style="list-style-type: none">I. The Industry/academia partners should put the money prior to release of funds by Government. The release would be proportionate.

		Elecsys Technologies Pvt. Ltd., Engie (GDF Suez Energy) Linkwell Telesystems, Yexcube Technologies			II. The IPR should be opened up after 2 years. III. The deliverables are to be clearly spelt out.
4.	Development of Indian Urban Driving Cycle for xEV	<u>Principal Investigator</u> IIT Madras [Department of Electrical Engineering / Computer Science & Engineering / Civil Engineering], IISc Bangalore (Department of Civil Engineering) <u>Industry Partners</u> Mahindra Electric; Bosch Limited, Bangalore; Robert Bosch Engineering & Business Solutions Pvt. Ltd., Coimbatore	Rs. 692.91 Lakh	Rs. 456.37 Lakh	The Committee, in principle, approved the project subject to meeting out the following observations made during the deliberation:- I. Compress the timeline II. The scope of the study should include regulatory requirements and consider different rating of batteries III. Re-examination of financials of the Project IV. Involvement of ARAI in the project
5.	HUB and SPOKE consortium for e-2W and e-3W Electric Drives	<u>Principal Investigator</u> TVS-Lucas Limited; NFTDC, Hyderabad <u>Institutions</u> IIT Guwahati; IIT Jodhpur; IIT BBSR; VIT Chennai; NITTEE, Surathkal <u>Industry Partners</u> Lucas TVS, Chennai; Ampere Vehicles, Coimbatore; Electrotherm; Lohia Auto Industries	Rs. 369.10 Lakh	Rs. 297.10 Lakh	The Committee, in principle, approved the project subject to examination of the same by Director (F&A), NATRIP from budget and other costs involved therein. Committee directed that one of the institutions should lead the project and industry should be partners. As in other cases, there would be proportionate release of funds by DHI after industry puts in the money first.

6.	Switched Reluctance Traction motor and controller for 2W & 3W	<u>Principal Investigator</u> Aditya Auto Products & Engg. (I) Pvt. Ltd.; NITK Surathkal <u>Industry Partners</u> Hero Eco; Ampere Vehicles Pvt. Ltd.	Rs. 2019.99 Lakh	Rs. 1325.26 Lakh	The Committee, in principle, approved the project subject to meeting out following observations made during the deliberation as following:- I. Academia should be lead partner II. Need to revisit the financials and cost sharing arrangements
7.	Synchronous Reluctance Motor Drive for Indian Electric Vehicle applications	<u>Principal Investigator</u> IIT Madras <u>Industry Partners</u> Mahindra Reva Electric Vehicles Ltd., Bengaluru.	Rs. 261.35 Lakh	Rs. 169.10 Lakh	The Committee, in principle, approved the project subject to further working on timeline and the costing involved in the project.
8.1	Proposal of Electrotherm (India) Ltd. for inclusion of Carbon Foam Batteries in Advance Battery Category	Electrotherm (India) Ltd.	----	----	The committee felt that since carbon foam battery of Electrotherm contains lead, it would not be possible to include it in the category of advanced battery as per definition given in the FAME India Notification. Further, with FAME Scheme extension being available only upto 31 st March 2018, there may not be much to gain by including Carbon Foam Batteries within the definition of Advance Battery.
8.2	Hiring of one eVerito Electrical Vehicle for DHI	-----	----	----	The Committee granted post-facto approval to the proposal of Department of Heavy Industry for hiring of one eVerito for a period of one year w.e.f. 21/12/2016 i.e. up to 20/12/2017.

Other Decisions :

On enquiries from participants for maintaining account of fund to be released by the Government through this scheme, Secretary (Heavy Industry) observed that there is a need to look into the accounting procedure; In-kind contribution; Capital Assets creation; Proper MoU with milestone based payments, clarity in structuring institutional overheads etc. He suggested AS&FA, DHI may separately look into these aspects to develop common guidelines or clauses to be adopted.