MeitY-MHI Joint Call for Proposal
for
Development of Electric Vehicles (EVs) Sub-Systems (EVSS)

The global initiatives to reduce carbon emissions through sustainable solutions have been spurred by the environmental effects of fossil fuel. One of the key strategies for achieving net zero carbon emissions is the replacement of fossil fuel-powered vehicles with electric ones. For the development of a sustainable e-Mobility ecosystem, local manufacturing skills and the indigenous development capability for electric mobility are crucial. Keeping this in view a short-term R&D programme (EVSS-01) was initiated by the Ministry of Electronics and Information Technology (MeitY) in 2021. Now, a number of technologies have been identified for indigenous development in the EV domain. Accordingly, MeitY in association with Ministry of Heavy Industries (MHI) proposes to invite proposals for technology development in the identified thrust areas of EVs.

MeitY will be the nodal ministry for the execution of the programme, while MHI will propagate the developed technologies to the user agencies through industry associations etc. MHI will also provide standardization and testing support for the developed technologies.

Objective and Scope:

The objective of the program is to develop the sub-systems required for an Electric Vehicle in the areas of Electric drive train with electric motors & drive controllers, Electric Vehicle Charging infrastructure with options of charging from AC and DC in various voltage/ current levels, Grid disturbances due to EV, and Battery Management System with safety, intelligence, etc. This program aims at the development of indigenous subsystems with major share of indigenous components resulting in quality, cost effectiveness and ready for commercialization in association with relevant industries.

The project leading to development of a device/prototype with Technology Readiness Levels (TRL) 7 and above and having potential for

commercialization will be preferred for financial support. Basic R&D proposal leading to only research publications may not be considered under this call. Besides for TRL level requirement, Chief Investigators (CIs) are advised to look into Regulator Readiness Level (RRL) and Market Readiness Level (MRL) for implementation of the technology.

The maximum project duration (including product development, field testing and commercialization) may be upto 36 months depend upon the complexities. However, the proposals with shorter duration will be preferred. The broad areas of development of EV subsystems and its target specifications, are listed in the Annexure.

Implementation modalities:

- EV sub-systems development has to be taken up in consortium mode in one of the following given structures:

i. For the agencies having requisite R&D infrastructure i.e., laboratory, test & measuring instruments, machine/tooling etc., for prototype development, the consortium will be as follows:

   - Academic Institutions/ R&D organization/ Industry/ Start-up for design & development – Project Leading Agency (PLA)
   - Industry for scaling up and commercialization.
   - Vehicle manufacturer for the usage of the developed products in their regular production.

ii. For the agencies lacking the infrastructure for prototype development, the consortium will be as follows:

   - Academic Institutions/ R&D organization / Start-up for design & development – Project Leading Agency (PLA).
   - Product Development Agency (PDA) to support the development of the product.
   - Industry for scaling up and commercialization.
   - Vehicle manufacturer for the usage of the developed products in their regular production.

iii. Eligible Industries having the capabilities of design & development, component manufacturing and vehicle manufacturing and fulfilling the criteria of consortium may participate individually and will act as Project Leading Agency (PLA).

Who can apply?

i. Eligibility Criteria for Academia:

The government and private academic Institutions with the following eligibility criteria will be considered for financial support.

- The Academic Institutions should preferably have requisite R&D infrastructure i.e., laboratory, test & measuring instruments, etc. in operational condition and Chief Investigator(s) from the institution should be the regular faculty with experience in relevant domain.

ii. Eligibility Criteria for R&D organizations:

- All Scientific Societies, R&D laboratories/ institutions, Central public sector enterprises (CPSEs), State Level Public Enterprises (SLPEs) ,etc. are eligible to submit the R&D proposals for financial supporty.
- The applicant R&D Organization should have the basic R&D infrastructure.
- Chief Investigator(s) should be the regular employee with experience in relevant domain.

iii. Eligibility Criteria for Industry:

- Domestic companies (viz. Startup and MSME company, Section-8 company, DSIR recognized R&D organization) are eligible as per following criteria:
  a) Startups shall be defined as per the DPIIT notification dated 19th February 2019 or extant norms.
  b) MSMEs shall be defined as per the Gazette Notification by Ministry of Micro, Small and Medium Enterprises, dated 1st June 2020 or extant norms.
  c) Section-8 company as per Section 8 of the Companies Act, 2013 or extant norms.
- The company should have the requisite R&D infrastructure in the relevant domain.
- Chief Investigator(s) should be the regular employee with

experience in relevant domain.

Only Domestic Companies are eligible; which shall be defined as Companies which are owned by resident Indian citizens as defined in the FDI Policy Circular of 2017 or extant norms. A company is considered as 'Owned' by resident Indian citizens if more than 50% of the capital in it is beneficially owned by resident Indian citizens and/or Indian companies, which are ultimately owned and controlled by resident Indian citizens.

All implementing agencies have to qualify individually in case of joint collaborative proposals.

The Product Development Agency (PDA):

- PDA may be
  - An organization or company registered under section 8 of the Companies Act 2013.

    Or

  - An established R&D or prototyping centre having experience in design, rapid prototyping capabilities and in management of R&D projects.
  - PDA should have been established at least one year before the issue of Call for Proposals. It should also have delivered hardware products in electrical, mechanical, electronics, IT domains etc.
  - PDA should have skilled manpower and capacity to handle the development work in the above-mentioned areas but not limited to.
  - Agencies like T-Works, ARAI, ICAT, iCreate, MOTION, GARC / NATRAX, industries, prototyping centres etc., may be used as PDA.

Funding Modalities:

- Minimum upfront contribution of 20% in cash by any industry partner in a consortium is mandatory.
- Project Leading Agency (PLA) of the consortium need to sign a

separate MoU with each partner defining their contribution, roles and responsibilities etc., towards the project deliverables.

- Academic institutions and start-ups need to sign MoA with any PDA which will support the institutes by providing their expertise and the proto-typing centre for developing the product.

MeitY R&D guidelines will be followed in implementation of the projects. The proposals should describe in detail the idea, the proposed development plan along with the verifiable milestones, timelines, budget requirement and engagement with prospective technology transfer partners or technology transfer facilitating bodies.

Proposals submission date:

Proposals along with signed Terms and Conditions may be submitted in the given format online on the Prime Portal (links given below) within a month after publishing it on MeitY and MHI websites.

https://meityprime.in/MEITY/HomePage
https://www.meity.gov.in/writereaddata/files/PDF-1.pdf)

General Terms and Conditions for the Grant:

1. Details on Proof of Concept /Early prototype done should be provided in the proposal.
2. The Chief Investigator (CI) can submit only one proposal against this call. Submission of more than one proposal from a CI would be liable to be disqualification of all the submitted proposal.
3. The Academic institution/R&D organisation/industry where the project will be implemented will assume financial and other administrative responsibilities of the project.
4. In case of multi-institutional project, the CI has to obtain formal agreement from the collaborating institutions/scientists.
5. International travel is not permissible under this scheme.
6. The manpower recruited for the project should be paid as per the rules of the institute/ guidelines of the Government of India (OM. No. SR/S9/Z- 08/2018 dated 30.01.2019 and SR/S9/Z-05/2019 dated 21.08.2019). The posts which are not covered

under the guidelines but permissible under projects at host institute are also permitted. The temporary staff appointed for the project by the organization is not treated as employee of Government of India.

7. It is the policy of MeitY to maximize the use of equipment. In this light, investigator shall permit the use of spare or idle capacities of equipment procured under the project by bonafide users (research workers in other MeitY funded projects or other projects of the institute).
8. All the assets including equipment acquired and prototypes fabricated from the grant will be the property of Government of India and should not be disposed of, or utilized for purposes other than those for which the grant has been sanctioned, without the prior sanction of the MeitY.
9. The Comptroller and Auditor General will have the right to access to the books and accounts of the organization for Grants received from the Government.
10. The grantee organization will maintain TSA account for receiving the grant in aid for the project. For Grants released during F.Y. 2024-25 and onwards, all interests and other earnings against released Grant shall be returned back, immediately after finalization of accounts, as it shall not be adjusted towards future release of Grant. A certificate to this effect shall have to be submitted along with Statement of Expenditure/ Utilization Certificate for considering subsequent release of Grant/ Closure of Project accounts as per the extent norms of GFR.
11. As per the recommendation of the review committee, Grant can be terminated by MeitY at any stage if the Grant has not been properly utilized or appropriate progress has not been made.
12. In case a CI wishes to leave the organization where the project is based, the organization/investigator will inform the same to MeitY immediately and take steps to ensure successful completion of the project, before relieving the CI. The CI should submit three copies of detailed report including circuit diagram, source code, mechanical design, PCB design etc. of the work done by him on the project before leaving the organization.

13. The CI / organization will prepare all the documents that would be required for the transfer of know-how to the production agency/agencies and submit them to MeitY as and when required. The organization will be responsible to transfer the know-how developed to the production agency/ agencies and supply all the needed information to the production agency/ agencies as and when required.
14. No financial support for equipment will be provided to the industry.
15. The details of assets/facilities created with the MeitY funding will be made available on the MeitY PRIME portal. It will help in optimum utilisation and sharing of assets/facilities within research community.
16. Any dispute on any matter related to the implementation of the project, the decision of Competent Authority, MeitY, shall be final and binding on the Implementing Agency.
17. MeitY reserves the right to modify these terms and conditions governing the grant-in-aid from time to time.

Guideline for IPR rights/ sharing and Technology Transfer/ Commercialization :

i. The MoA signed among the consortium partners should clearly indicate the IPR sharing and the documents needs to be submitted as part of proposal.
ii. Prior to seeking the expression of interest for technology transfer/commercialization, there should be sufficient disclosure of the technical details, features and capabilities of the project through advertisement, publication on the websites of the Implementing Agency, MeitY, and other agencies (private, government) exhibitions/workshops, if any held on the related themes during the relevant period. The ToT proposal may be given wide publicity in national dailies/ online forums/social media platforms besides in journals relating to the theme and by writing to the industry associations related to the theme
iii. The ToT Committee may be constituted by the Nodal Center of the

programme for a techno-commercial evaluation including the likely revenue expected from the proposals received. The ToT committee will work out the cost of ToT on case-to-case basis considering the ground realities like i) development cost of the project ii) market demand of the technology/product iii) ability of the industry to pay for the technology iv) work involved from prototyping to packaging, v) the recommendations of the Working Group, if any, in this regard etc. The cost of capital equipment will be excluded from the total cost of development. Such an estimated cost shall be used as the Internal Benchmark for evaluating the ToT fee and royalty.

iv. Based on recommendation by the ToT Committee & Review committee:

In general, the technology will be transferred on non-exclusive basis to the industries. However, subject to Ministry approval, the technology may be considered for transfer on exclusive basis in the following cases– (a) to an industry that contributes more than 50% of the total project in cash and kind with significant contribution in cash (b) to an industry for a limited duration; on a case-to-case basis, if the industry's contribution is less than 50% of the total outlay of the project .

v. After due diligence by the ToT committee, a technology transfer/ licensing agreement shall be signed for licensing the developed IPR.

vi. The Academic / R&D institution is permitted to retain the benefits and earnings/revenue arising out of the technology transfer/ licensing of IPRs for ploughing back to pursue research/ in related areas.

vii. Export of technology /R&D/ know-how developed under the project will be as per the Government of India extant Rules and Regulations.

viii. Notwithstanding the above, MeitY reserves the right to take over ownership of the rights of the Intellectual Property arising out of the project, in the interest of the Indian sovereignty, without any compensation to the Implementing Agency.

Royalty Guidelines for industry/start-ups

i. The Company shall pay royalty to MeitY at the rate of 3 (three) percent on annual Net Sales of the product(s) developed with MeitY's funding. Payment of royalty shall fall due after a moratorium period of 2 years from the date of first commercial sale of the product(s). The liability to pay royalty will terminate upon the first of any of the following two events to occur: - a) 3% royalty has been paid to MeitY till the royalty amount paid becomes 1.5 times the amount of Grant-In-Aid disbursed; or (b) in case of Foreclosure or Termination of Project as per the terms of Administrative Approval.

ii. Royalty for each financial year shall be payable to MeitY within 90 (Ninety) days of closure of corresponding financial year.

iii. If the Company intends to transfer or sell/ assign the Product's interests/ rights to any third party, it shall take prior written permission from MeitY. MeitY will recover the due Royalty amount or 3% of the resultant income till the royalty amount paid becomes 1.5 times the amount of Grant-In-Aid disbursed excluding applicable GST & other taxes, as certified by the Chartered Accountant, whichever is less, before grant of such permission.

iv. Start-ups to either – (a) refund back the funds to MeitY, supported under the project as a royalty mentioned above or (b) make available the IPR with Govt of India; if they lose their domestic status due to acquisition or change in shareholding pattern of the company within 3 years of the date of last release of funds by MeitY.

For any further queries, please contact the following:

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Annexure:

I Areas of development of EV subsystems and its target specifications

A EV Chargers and Charging Infrastructure

A1 *Technology for Unidirectional/Bidirectional charging Electric Vehicle Supply Equipment (EVSE)*

Input	***Output***	***Type/Standards****
230V,1ΦAC	3.3kW-7.5kW,1ΦAC	AIS-138, IS 17017 Slow/Fast charging, Low/ high voltage, Low/high Power, Inductive / Conductive charging Onboard/off board, Pole/wall mount, Domestic /Public chargers
	0.75kW to 2kW DC	
	1.5kW to 6.6kW DC	
415V,3ΦAC	11kW to 43kW AC	
	11kW to 360kW DC	
415V,3ΦAC	15-40kWPower Electronics modules DC output 150–1000V	Unidirectional DC / Bidirectional AC/DC
11kV,3ΦAC	415V 3ΦAC/750-1000VDC	Technology for Ultra-Fast Charging with/without Energy storage system
1Φ/3ΦAC	DC Power bidirectional. + V2L, V2V, V2G, V2B AC/DC Power bidirectional	IS 17017

*Added features of cyber security are encouraged

A2 *Renewable integrated charging*

The integration of renewables with the interface of EVSE

- ✓ Solar, wind and other renewable sources for EV charging

- ✓ EV charging with excess energy storage solutions
- ✓ AC and DC EV chargers with renewable source interface

A3 ***Technology for Onboard Chargers***

Input	***Maximum Output***	***Type/Standards***
230V / 5A, 1Φ	1kW (48V to 96V)	ISO 26262, IEC 61851,DINSPEC70121,ISO15118 CANJ1939, SAEJ1772, AIS 004 PART 3 Rev 1.
230V / 16A, 1Φ	3.3kW (48V 96V and 120V to 400V)	
230V / 32A, 1Φ	6.6kW (200V to 800V)	
415V / 16A, 3Φ	11kW (200V to 800V)	
415V / 32A, 3Φ	22kW (200V to 800V)	
415V / 63A, 3Φ	43kW (400V to 800V)	

* **Passenger Vehicle Application: 4W**

- · 2in1 (OBC + DC-DC)
- · 3in1 (OBC + DC-DC + PDU)

DC chargers, including for Fast Charging

- · Power modules for DC Charger, 30/60 kW

B Machines and drives for EV

B1 ***Low power drives for E2W & E3W(This section refers to Motor control electronics)***

Input	***Output***	***Type/Standards***
48V - 96V DC	Power: 1 kW - 10 kW	AIS 041, AIS 038/ARAI standards

B2 *High power drives for E4W & E-mini-Bus/Trucks*

Input	***Output***	***Type/Standards***
200V-750V DC	Power: 10 kW - 200 kW	AIS 041, AIS 038, Part 1, REV 2 standards

B3 *Special Machine for EV drives*

This section is for 'differentiated' machine topologies that offer efficiency / cost benefits or lower usage of rare earth magnets

Input	***Output***	***Type/Standards***
48V-120V	Power: 1 kW –15 kW	AIS 041, AIS 038/ARAI standards
120V-500V	Power: 10 kW – 200 kW	AIS 041, AIS 038/ARAI standards
>500V	Power: 100 kW-250 kW	AIS 041, AIS 038/ARAI standards

B4 Retrofit for EVs (w.r.t OEMs)

These kits shall consist of complete power trains that can be ARAI certified

Input	***Output***	***Type/Standards***
48V-96V DC	Power: 5 kW – 30 kW	E2W & E3W, and 4 wheelers

		BIS/AIS 123 standard as amended upto date

B5 ***EV Kits E4W minibus/Trucks***

Input	***Output***	***Type/Standards***
120-750 V DC	50 kW - 250 kW	E4W, other vehicles AIS 041, AIS 038/AIS 123 standards as amended upto date

C Battery and Battery Management Systems

C1 ***Battery swapping Station***

Input	***Output***	***Type/Standards***
230 V, 50Hz,	48VDC-72VDC 1kW-3kW Battery	BIS/AIS standards for BSS for LEVs
415V, 50Hz 3Φ AC	300VDC to 800V DC Power levels suitable for automatic/semi-automatic modes	BIS/AIS standards for BSS for High/Mid Power drive EVs

Type of BMS	***Type/Standards***
Centralized BMS for 48V to 96V (Max 30S) 2.5 kWh–20 kWh Battery capacity	L category vehicles Amendment to ARAI standard AIS 156, as amended upto date

Distributed BMS (wired and wireless) for 120V to 800V with master-slave architecture for 20 kWh–200 kWh Battery capacity	4W and Buses, AIS 156, as amended from time to time AIS 038 PART II: Requirements Of A Rechargeable Electrical Energy Storage System (Reess) With Regard to Its Safety Performance Testing To have India specific algorithm with novel SoC, SoH, Thermal and Isolation monitoring, active cell balancing, Wireless BMS

C2 BMS for slow/fast charging

C3 Battery packing Technology

Input	***Output***	***Type/Standards***
Battery Technology	Cell to battery Pack Engineering	AIS 156,AIS 038 Rev 2 AIS 048

D. Telematics, Functional Safety and Security

D1 Telematics, Data Analytics, Remote Monitoring and Diagnostics

Type	**Standards**
5G Telematics gateway unit with standard and digital SIM - individual module or integrated with cluster unit.	AIS/ BIS standards / ISO standards/ IEEE Standards
Real-time remote monitoring and control	
Data analysis and processing	

- for usage patterns, energy utilization, and optimization, root cause analysis of faults, etc.	
Remote prognostics and diagnostics to enable over-the-air (OTA) updates and remote configuration, - implement digital twin for performance optimization, identify component and system degradation, and provide remote diagnostic and emergency management solutions.	

D2 Fails-safe Design and Functional Safety

Type	**Standards**
Product and sub-system development meeting the global safety norms.	ASIL levels QM, A, B, C, and D and complying ISO 26262
Hardware incorporating the safety mechanisms - to control internal failures and to have required failure tolerance for external effects including EMI/EMC.	AIS/ BIS standards / ISO standards/ IEEE Standards
Functional safety concepts for fault detection, failure mitigation, driver assistance, and warning, taking the system /vehicle into a safe state in case of hazardous situations or failures.	AIS/ BIS standards / ISO standards/ IEEE Standards

Note: Section D2 (Fail-safe Design and Functional Safety) requirements are applicable to all the above listed products as per their safety requirements.

II Center for prototyping, testing, and validation of EV Sub-Systems

The area of operation of the center can function with any of the following EV sub-systems but not limited to

1. Chargers and charging infrastructure technologies
2. Electric Machines and their power train
3. Power Electronics and related converter technologies
4. System Testing for standards and validation (Electrical and Environmental)
5. Electronics and their auxiliary EV sub-systems

End of Document