

**CALL FOR RESEARCH PROPOSALS UNDER THE “R&D SCHEMES OF MOP
BEING IMPLEMENTED THROUGH CPRI”**

In order to address the issue of air pollution due to farm stubble burning and to reduce carbon footprints of thermal power generation, the Ministry of Power has set up the **Sustainable Agrarian Mission on use of Agri-Residue in Thermal Power Plants (SAMARTH)** also known as *National Mission on use of Biomass in coal based thermal power plants* with the following objectives :

- (a) To increase the level of co-firing from present 5% to higher levels to have a larger share of carbon neutral power generation from the thermal power plants.
- (b) To take up R&D activity in boiler design to handle the higher amount of silica, alkalis in the biomass pellets.
- (c) To facilitate overcoming the constraints in supply chain of bio mass pellets and agro- residue and its transport up to the power plants.
- (d) To consider regulatory issues in biomass co-firing.

[**Reference** : PIB press release <https://pib.gov.in/PressReleasePage.aspx?PRID=1721473>]

The Mission is presently seeking intervention to solve certain specific technical issues pertaining to co-firing of biomass.

In the present call, proposals are invited from Academia and R&D Institutions on some of the identified research areas of SAMARTH, under the “**R&D Schemes of MoP being implemented through CPRI**”. The topics for research are enclosed as **Annexure I**. Project proposals are to be formulated keeping a view of the impact on the power sector in the future. The project should have substantial research content and element of innovation. The objectives of the project should be clearly defined as per the requirement specified in **Annexure I**, with a plan for implementation and the final outcome is expected to be in line with the requirement of SAMARTH Mission.

The duration of the project should not exceed 2 years.

Proposals along with the technical and financial particulars may be submitted in the prescribed “**R&D under National Perspective Plan (NPP)**” format (enclosed as **Annexure II** and also available on the CPRI website in the following link, <https://cpri.res.in/en/r-%26-d-schemes/research-scheme>) to:

Additional Director & HoD R&D Management Division Central Power Research Institute, Prof. Sir. C. V. Raman Road, Sadashivanagar, P. B. No. 8066, Bangalore - 560 080.	Phone : 080 2207 2234 E-mail : mvrao@cpri.in rnd@cpri.in
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Last date of submission for the proposal is: 09th August 2024

List of research areas :

<p>1) Investigating Biomass Pellets for foul odour and proposing the limiting value of relevant constituents (like ash, sulphur etc.) along with their standard testing method</p>
<p>a) Objective is to determine the materials causing foul odour and also to restrict the usage of these materials in biomass pellets by specifying the limit of relevant physical or chemical properties (like ash, sulphur) of biomass pellets.</p> <p>b) Special attention may be given to usage of press mud, poultry waste in pellets.</p>
<p>2) Determine the recommended Volatile Matter Content (VM%) in biomass pellets (Torrefied / Non-Torrefied) for safe firing at different co-firing ratios in Thermal Power Plants</p>
<p>a) Objective is to recommend the safe limit of Volatile Matter (VM%) in biomass pellets for co-firing in thermal power plant boiler.</p> <p>b) To study the effect of Volatile Matter (VM%) on primarily the thermal power plant mills at different increased levels of Biomass Co-firing.</p> <p>c) Additionally, the effect of Fixed Carbon to Volatile Matter (FC/VM) Ratio of the blended fuel may also be studied.</p>
<p>3) Techno-Commercial Analysis of 22% VM Torrefied Pellet Production</p>
<p>a) Evaluate the techno-economic feasibility of producing torrefied pellets with <22% VM with recommendation on the machinery used in the plant.</p> <p>b) Conduct comprehensive cost-benefit analysis of a commercial scale torrefied pellet plant including capital cost, pricing of pellets, market scenario & other technical considerations.</p> <p>c) Establish the long term viability of the initiative and recommend the best way to produce torrefied pellets having less than 22% VM.</p>
<p>4) Suggest a methodology to distinguish between torrefied and non-torrefied biomass pellets based on their physical and/or chemical properties</p>
<p>a) Advantageous properties of torrefied pellets make them well suited for thermal power plant. The objective of the project would be to ensure that torrefied pellets :</p> <p>i. Are manufactured following the due process of torrefaction</p> <p>ii. Meet the typical properties expected after torrefaction</p> <p>iii. Can be distinguished from non-torrefied pellets based on lab testing</p>
<p>5) Test study on range of Mill Inlet Temperature, Mill Outlet Temperature, volatile matter (%) & moisture present (%) in coal & biomass pellets mixture w.r.t. different percentage of biomass co-firing in coal based thermal power plants having bowl mill, ball & race mill and ball & tube mill</p>

Format for submission of Proposals

1. a) Name of the Implementing Organization/Institute and Address
b) Name of the Collaborating Industry and Address
2. a) Name of the Principal Investigator (PI) and Project team
b) Name of the project team members of Collaborating Industry
3. Project Title
4. Objectives
5. Justification
6. Facilities required by the Implementing Organization/Institute (*in terms of equipment's / accessories*)
7. Facilities provided by the collaborating Industry (*in terms of equipment's / accessories*)
8. Broad overview of technical programme
9. Bar chart of technical work on quarterly basis with major milestones to be achieved.
10. Total Estimated cost of Project (*Rs Lakhs*)
 - a) Expenditure break up*:

SL No	Particulars	Year wise break up (<i>Rs Lakhs</i>)		Total Cost (<i>Rs Lakhs</i>)
		I year	II year	
1	Major Equipment's			
	a.			
	b.			
	c.			
2	Software / Hardware			
3	Temporary man power (SRF/JRF/RA/PA/Consultancy)			
4	Consumables / Miscellaneous			
5	Travel / Contingencies			
6	Outsourcing of facilities			
7	Others (<i>if any</i>)			
8	Institutional overheads (10%)			
Grand total				

b) Financial contribution from the Industry

11. Project duration

12. Details of End user / Partner for execution of project work / field implementation and nature of involvement of partner

13. Specific deliverables of the project in terms of

- i. *Knowledge gained*
- ii. *Research publications*
- iii. *Patents*
- iv. *Process and product development*
- v. *Contribution towards improvements in issues concerning System operation*
- vi. *Value addition*

14. Benefits / returns from the project work (*indicate likely benefits to Indian Power Sector / Indian Utility / Manufacturer / Society*)

Mandatory Enclosures:

- Brief summary of work carried out by PI and team members in the last 5 years.
- Details of Publications in National / International Journals / Patents.
- Details of Research projects completed / ongoing of the PI (*if any*)

SL No	Project Title	Outlay (Rs Lakhs)	Sponsored (Scheme)	Project Outcome / Deliverables	Publications / Patents (numbers)
1					

- Brief CV / Bio data of PI and team members
- Complete address of PI for communication (*includes Mobile, Landline and Fax number, email id etc.*)
- Details of Existing Lab / Analytical / Computational facilities.
- In case of Engineering Colleges, details of research center, facilities, PG courses, Doctoral program and number of PhD Scholars may be furnished.
- Letter of consent from the collaborating Industry to support the research project

Note:

- A soft copy of the proposal may be sent to mvrao@cpri.in , the hard copy of the proposal may be sent to CPRI

Certificate

- A. This proposal has the approval of the Organization and all the existing facilities shall be made available for carrying out the studies on the proposed scheme
- B. That the research work proposed in the scheme does not in any way duplicate the research work already done or being carried out in the research station on the subject.
- C. That the project is not being partly or fully financed by grant from any other Organization / Government

Name and Signature of the Principal Investigator

Signature of the HOD / Head of the Implementing Institution / Organization

(With seal)

Date: