



Center for Advanced Power Engineering Research

Solicitation for New Research Projects

Beginning in January 2022

Announcement: December 15th, 2021

Proposal Submittal Deadline: February 28, 2022

Confidential: For use by CAPER members only

I. Overview

This research solicitation is intended for members of CAPER to form collaborative teams and submit research proposals that are consistent with the mission for CAPER which is to advance, develop and promote research related to the reliable and efficient management of the power grid, including modeling and analysis techniques for generation, transmission and distribution planning and operation with and without presence of renewable energy resources. Project proposals are expected to align with the stated five research theme areas: Power Delivery Infrastructure and Systems, Power Utilization and Energy Efficiency, Power Generation, Storage and Integration, Data Management, Analytics and Security and Energy Policy, Markets and Economics. Submitted proposals shall follow the guidelines provided in this solicitation. Any questions related to the project proposals can be directed to the Center Director or any one of the Center Co-Directors noted below:

Center Director: Dr. Mike Mazzola – UNC Charlotte (mmazzola@uncc.edu)

Center Co-Director: Dr. Badrul Chowdhury – UNC Charlotte (bchowdhury@uncc.edu)

Center Co-Director: Dr. Mesut Baran – NC State University (baran@ncsu.edu)

Center Co-Director: Dr. Johan Enslin – Clemson University (jenslin@clemson.edu)

You may also contact officers of the Industry Advisory Board noted below:

IAB Chair: Klaehn Burkes – SRNL (klaehn.burkes@srl.doe.gov)

IAB Vice-Chair: Andrew Clarke – Duke Energy (andrew.clarke@duke-energy.com)

Center Steering Committee Chair: Steven Whisenant – Duke Energy
(steven.whisenant@duke-energy.com)

Before submitting a project proposal, it is suggested that researchers and industry members attend the Research Planning Workshop held annually to promote discussions between universities and industry for the generation of research topics. At the end of this solicitation are several suggested research topics. In addition, university researchers and industry members can send descriptions of research topics to the Center Director, Dr. Mike Mazzola, for consideration.

II. Requirements for Research Proposals

Submittal Deadline: February 28, 2022, by mid-night local time of project leader

Eligibility: Research proposals may be submitted by researchers at CAPER Universities who are not on any project team that has a late, outstanding CAPER final project report unless approved by the Center Director. Adjunct researchers may be members of a project team but cannot serve as a Project Team Lead.

Evaluation Criteria: The following criteria will be used by the Industry Advisory Board (IAB), the Center Steering Committee and the Center Director to review, prioritize and select proposals for funding.

1. Industry Issues:

- a. Does the proposed project have at least one Industry Advisor from the industry membership?
- b. Does the proposed project have application to the industry?
- c. Is the project relevant to the needs of the industry?
- d. Is there student involvement? Are the students involved graduate or undergraduate?
- e. Sound collaboration plan between industry and universities.

2. Center Issues:
 - a. Does the project proposal align with the solicitation?
 - b. Are there researchers from at least two different universities?
 - c. Is the collaboration between universities equitable?
3. Quality:
 - a. Is the proposed project innovative and creative?
 - b. Does the project team have good past records?
 - b. Are the deliverables relevant and applicable?
4. Budget and Equity Issues:
 - a. Does the project contain equitable university funding requests?
 - b. Is the budget in line with the scope of the work, typically \$45,000 per project?
 - c. Does the project contribute to the balance between basic vs. applied research?
 - d. Does the proposed project support CAPER's vision to educate students by including them in the project?
 - e. Does the proposed project have one Project Leader and at least one researcher from another university?

Project Duration: A project should not span more than two years. For example, a typical project will run August 1, 2022 to December 31, 2024. Funding will be provided once sufficient industry membership support has been received at the Lead University. Final Reports are due at the end of the project period (typically March 31, 2025). Industry Advisors must review each Final Report before it is submitted.

Funding Period: Selected projects begin as soon as funds are available, and funding is on a calendar basis.

Budget for New Projects: The number of projects that will be funded for 2022 will be determined by the number of industry members that have executed industry membership agreements and have delivered the funds to CAPER by March 1, 2022.

Projects per Researcher: Typically, CAPER will fund one new project each period for a researcher as the Project Lead or as a Project Team member. If a researcher is on the team of more than one selected proposal, then that researcher should expect a reduction in funding of \$5,000 per project per funding year.

Project Budgets: The typical budget for a single project is \$45,000 per funding year, includes direct and indirect costs.

Research Themes: Each proposal must designate one of the designated five research focus areas. Proposals are discouraged from crossing over multiple research themes.

Industry Advisors: Each proposal must have at least one industry advisor contact and a plan for the industry advisor collaboration. (Examples include: meeting schedule, expectations by advisor(s), collaboration plan, etc.)

Proposal Length: Proposals shall not exceed five pages excluding all biographies and references. Any proposals exceeding five pages will have the extra pages discarded before evaluation.

Proposal Format: All proposals must be submitted in the CAPER Project Proposal Template. The template is attached to the solicitation.

Presentation to Industry Advisory Board: All proposals must be presented to the IAB during the next CAPER meeting. The project presentation template is attached to the solicitation.

Proposal Submissions: All proposals shall be submitted to the Center Director:

Dr. Michael Mazzola

Email: caper-proposals@uncc.edu

2021 CAPER Research Proposal Submittal, Review and Approval Schedule

Date	Action Items
November 3, 2021	2022 Research Planning Workshop
December 15, 2021	2022 CAPER Research Solicitation distributed
February 28, 2022	Proposals due to Center Director
March 6, 2022	Proposals reviewed by Center Steering Committee
March 13, 2022	Proposals reviewed and evaluated by IAB members
March 24, 2022	PIs notified on acceptance of proposal
March 26, 2022	Presentations made on selected proposals at General Meeting
March 26, 2022	IAB makes recommendations on Proposals to Center Steering Committee
July 24, 2022	Center Steering Committee makes final selections
July 29, 2022	Center Director notifies Project Leads of selected proposals
August 1, 2022	Funds for selected Projects are made available

III. Research Themes - CAPER's primary research focus areas are:

Power Delivery Infrastructure and Systems

This research focus deals with the impacts that an increasing penetration of distributed generation resources and a desired resiliency to extreme weather events have on the power delivery system.

Power Utilization and Energy Efficiency

This research focus deals with evaluation of smart distribution systems and energy analytics to meet increasing customer demands and expectations of energy utilization.

Generation, Storage and Integration

This research focus deals with developing and demonstrating optimal strategies to manage diverse distributed resources and storage.

Data Management, Analytics and Security

This research addresses new technologies and the wide-spread application of small-scale component sensors and data collection equipment have greatly increased the amounts of available data, but the challenge is how to manage, use and act on huge amounts of system data.

Energy Policy, Markets and Economics

This research focus deals with the impacts that regulatory policies and requirements place on the planning, design, and operations of the grid.

IV. Publication Guidelines If Awarded – Ref. CAPER Membership Agreement - Page 1, Section E: Publication. The Center Universities reserve the right to publish in scientific or engineering journals and to present in professional meetings the results of any research performed by the Center. Each Center University will submit any proposed publication or presentation containing results of the research program of the Center to Center Member. Center Member shall have the right to request a delay in publication for a period not exceeding ninety (90) days from the date of submission to Center Member, for proprietary reasons, provided that Center Member makes a written request and justification for such delay to the Center University within thirty (30) days from the date the proposed publication or presentation is submitted to Center Member.