National Laboratories Partner with U.S. Manufacturers to Increase Innovation and Energy Efficiency

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Welcome!

Attendees have been muted on entry, please remain on mute for the duration of the presentation.

If you have questions during the presentation, there will be question and answer sessions at the end of each panel session. Please submit questions to the panelist via the Q&A feature.

Please note meeting is set up only to display the panelist and will not show list of attendees.

Send Questions to All Panelists
Today’s Agenda

8:00 am - 8:05 am PT Welcome and webinar instructions
8:05 am - 8:35 am PT Overview of program
8:35 am - 9:00 am PT Q&A

Participant instructions
► Please turn off video and mute your phone
► Questions will be answered at the end of the briefing
  ► Send to “Q&A” panel

A copy of this presentation will be available on the HPC4EI Solicitation webpage.
HPC4EnergyInnovation umbrella
Summary - What is new this solicitation?

- This solicitation will include only HPC4Mfg and **not** HPC4Mtls
- Company units cannot submit more than one proposal
  - If you do submit more than one proposal, then the review team will select at most one proposal to go forward to the full proposal stage
- PLEASE review the budget requirements in the solicitation. For a $300K DOE contribution, the industry contribution (cash and/or in-kind) should be $75K (total project funding $375K) for demonstration projects (more for follow-ons). Many full proposals still use the old $60K number.
The DOE National Laboratories have some of the largest computers in the world and significant technical expertise offering the benefits of HPC to U.S. Industry

- Accelerate innovation
- Optimize design
- Reduce testing cycles
- Shorten the time to market
- Quality processes
- Reduce waste/reduce rejected parts
- Lower energy costs
The HPC4 Program is building an ecosystem to support HPC adoption by industry/government

- Showing what is possible with HPC through demonstration projects
  - DOE program office funds < $300K to laboratories
  - Industry funds at least 20% of total project funding; either in-kind support or optional cash contribution
  - Project duration < one year

- Building the HPC4 community
  - Student intern programs
  - Virtual events
Program Approach - Companies apply to program through a solicitation process

Engage industry

Industry submits challenges

Match challenge to PI

DOE sponsor approval; Feedback to industry

Sign agreements

Inform industry

Technical Review Committee

Technical Merit Review Committee
• Partner labs and DOE representatives
• Heavy focus on nation-wide impact to energy efficiency and clean energy technology industry-wide
• $300K DOE funds Laboratory PIs
• 20% in-kind from industry partner
Program Details: Eligibility and Funding

- Eligibility for call
  - Companies manufacturing or developing materials in the U.S.

- Who can be funded from the program
  - DOE National Laboratories
  - University collaborators can be funded by the industry partner or DOE National Laboratory
  - Encourage partnerships with universities and non-profit organizations located in federally-designated Opportunity Zones and or/Historically Black Colleges and Universities (HBCU)

- Industry participant cost share
  - At least 20% of **total** project funding for new projects
  - At least 33.3% of **total** project funding for follow-on projects
  - Can be used to support internal staff
  - **Source can not be other federal funding**
Program Details: If Awarded DOE Model Short Form CRADA

- Used for accelerated placement and execution
- Scope and IP protection defined
- Industry awardees required to sign DOE Model Short Form CRADA
- Standard DOE Model Short Form CRADA available on the web site
  - Individual labs may have some variances
- If concept paper is selected to go forward; you can ask your laboratory partner for a copy of the specific CRADA

Required!
HPC4Manufacturing solicitation topics directly align with DOE’s Advanced Manufacturing Office goals to save energy

Broad impact on energy efficiency and/or productivity:
- Use HPC to overcome a key technical challenge
- Process optimization
- Advanced product design
- Predicting performance and failure rates
Concept papers are the first step:

- Two-pages; single spaced; 12 pt. font - Use the template provided on HPC4EI website and HPC4EI Proposal System

Key Elements

- Title page
- Abstract (150 words or less) - must be a non-proprietary, publishable summary
- Background
  - Technical challenge to be addressed
  - State of the art in manufacturing and how this work advances the state of the art
  - Why national laboratory expertise and HPC resources are needed

Project Plan and Objectives

- Technical scope of the work and how this project fits into the overall solution strategy
- How results will be validated including availability of data
- Specific simulation codes that will be used if known

Impact

- How this effort results in long-term energy savings or
- Ability to accelerate innovative energy-efficient manufacturing
- Metrics include cost savings, energy savings, and improvement in energy intensity

You do not need to identify a laboratory partner up front! Just an interesting and difficult problem that HPC can help address!
Full proposals provide much more detail

- Six-pages; single spaced; 12 pt. font - Template will be available in the HPC4EI Proposal System after Concept Paper review notifications are sent.

- Key Elements
  - Title page
  - Abstract (150 words or less) - must be non-proprietary, publishable summary
  - Background
    - Similar to concept paper
  - Project Plan and Objectives
    - Similar to but more detailed than concept paper with specific tasks; specific simulation codes; modifications to the software needed etc.
  - Tasks, Milestones, Deliverables and Schedules
    - Goals, timelines and due dates of milestones and deliverables from all partners, including who is the responsible party for each deliverable and what will be communicated between the partners
  - Verification and Validation Plan
    - How do you intend to validate the findings of the model
  - Impact
    - Similar to concept paper but more detailed; is this transformational for an industrial sector and how; what is the enduring impact; how will results be disseminated
  - Implementation
    - How will this be incorporated into company and industry-wide operations; and follow-on activities to extend this effort to solve the broader problem being addressed
  - Various appendices (see next slide)
Appendices provide additional information

- Used in the review process; CRADA development process; compute resource determination, etc.
- Not included in the six-page limit
- Appendix A: References (not included in page count)
- Appendix B: Project summary of tasks and schedule (similar to project tasks in main proposal, but used for CRADA development)
- Appendix C: Project budget: costs, amount and source for participants, cost share (in-kind or cash); how funding makes a difference relative to existing funding
- Appendix D: Computational resources: computational approach, performance of the codes, resources requested (platform and core/node hours)
- Appendix E: Pictures for publication (Photos are used for program announcements)
- Appendix F: How the work benefits the laboratory
- Appendix G: Paragraph biographies of industry and lab lead PIs
- Appendix H: Resumes of key participants
Success Stories

P&G: faster modeling of paper towel drying process using parallel computing

GE: larger, higher fidelity turbine design using advanced turbulence models

ZoomEssence: new food particle dryer configuration using advanced CFD

Vitro Glass: real time control of glass furnace using deep-learning tools

P&G: faster modeling of paper towel drying process using parallel computing
Success Stories

GE: Powder spreading simulations for higher quality metal additive manufacturing

7AC Tech: Molecular simulations of porous membrane dessicant systems for efficient humidity control in air conditioners.

PPG: Optimizing paint rotary bell sprayers for higher flow rates and more energy efficient drying.

Alliance for Pulp and Paper Tech: Molecular simulations of the chemistry of the Kraft pulp process to improve paper yields.
Industry interested in simulations at many levels

- New alloy design: Alcoa, Arconic, Carpenter
- Junction design: Samsung
- Membrane design for de-humidification air-conditioning: 7AC Technologies
- Catalyst design for lignin denature: APPTI (paper manufacture consortium)
- Microstructure for additive manufacture, casting, welding: GE, Eaton, UTRC, GM, Arconic, Flash Bainite, US AK Steel, ArcelorMittal
- Predict stress-strain curves for new material: LIFT
- Engine/turbine tolerancing: Ford, GE
- Turbine CFD: GE, Rolls Royce
- Semiconductor deposition: Applied Materials, SORAA
- Furnace design: Vitro Glass, ArcelorMittal, Owens Corning
Proposal Application - Submit Paper Electronically!

Access the electronic proposal system at proposalshpc4.inl.gov or HPC4EI Solicitation website

Log on here

Instructions available for download on the system's Home page
Electronic Proposal Application

Create account and complete general account information

Click here

Provide information

New Password Requirements
Electronic Proposal Application

Proceed to Application tab to view Current Open Calls. Select “Create New Application”. Application form will appear in new window. Directions are displayed for each section.

Application must be saved before PI, Co-PIs, Proposal POC, and National Laboratory PIs sections can be populated. **Forms may be saved, revisited, and edited until the deadline.**
New Electronic Proposal Application - Upload Submission and Delegate Access

Concept Paper

Before uploading submission, ensure concept paper is formatted per provided Concept Paper Template.

Submission format: Single spaced pages using 12-point font (Times New Roman) and converted to a PDF file. Template instructional boxes should be removed from the document. A concept paper that does not meet the guidelines may be rejected for review.

Delegate access to another user in the system, click on the 'lock' icon. Delegated applications that you have been given access to will be displayed in the "Other applications you have been delegated rights to" section.

After completing and saving this form, the applicant may edit the saved version until Thursday, January 7, 2021 3:00 PM PT. To submit the proposal for final review, the applicant MUST click on the "Save and Submit" below. Forms in the system that are "Saved" but not "Submitted" are considered incomplete and will not be reviewed.

Click to download Concept Paper Template

For assistance please contact Michelle Herawi at 925-423-4564 or hoder-submissions@nl.gov.
Notifications of review results are generated from the proposal system and addressed from hpc4ei-submissions@inl.gov. It is highly recommended to add the email address to contact list to avoid notification directing to spam.

Visit the Applications page to view proposal status and Technical Merit Review Committee comments.

Contact the HPC4EI Proposal Helpdesk at hpc4ei-submissions@llnl.gov.
Visit our website for solicitation details

**Concept Paper Deadline**  
June 8, 2021 by 5:00 p.m. PT

Additional information at [www.hpc4energyinnovation.org](http://www.hpc4energyinnovation.org)


Questions can be sent to [hpc4ei@llnl.gov](mailto:hpc4ei@llnl.gov)

Join the [hpc4ei-info@llnl.gov](mailto:hpc4ei-info@llnl.gov) distribution lists via the web to receive program announcements

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