

HPC4Mfg Program Webinar

Advancing Innovation: National labs partner with US Manufacturers to increase innovation and energy efficient

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Today's Agenda

8:00 – 8:05 Welcome and webinar instructions

8:05 – 8:20 Overview of program

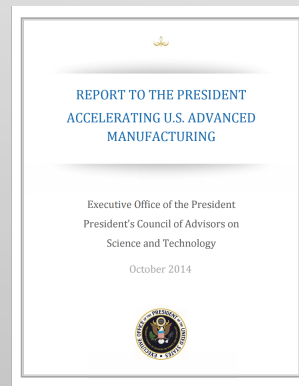
8:20 – 9:00 Q&A

Participant instructions

- Please turn off video and mute your phone when not asking a question
- Questions will be answered at the end of the briefing
 - Send to "Everyone" via Chat

HPC can help infuse innovation into US Manufacturing to bring advanced products to market and save on energy

Apply High Performance Computing (HPC) capabilities and expertise at the national labs to increase US Manufacturing innovation and energy efficiency



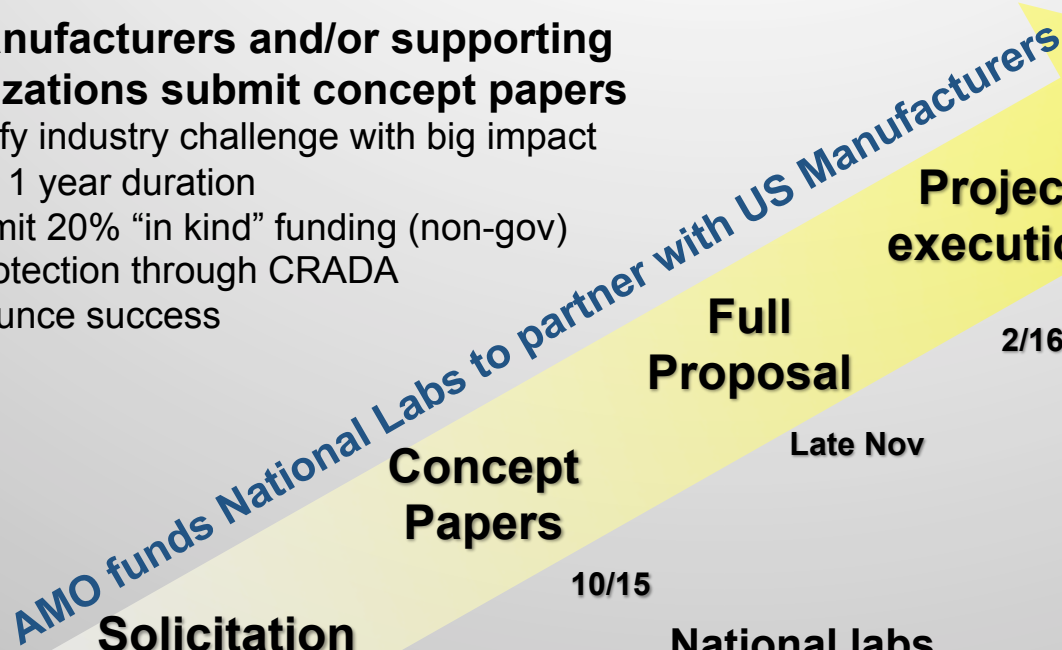
De-risk the adoption of HPC into the US Manufacturing Industry

HPC4Mfg enables partnership between the National Labs and US Manufacturing

Increase Energy Efficiency - Advance Clean Energy Technologies

US Manufacturers and/or supporting organizations submit concept papers

- Identify industry challenge with big impact
- Up to 1 year duration
- Commit 20% “in kind” funding (non-gov)
- IP Protection through CRADA
- Announce success



Project execution

Full Proposal

2/16

Late Nov

Concept Papers

10/15

Solicitation Announced

9/15

National labs

- LLNL (lead), LBNL, ORNL, other labs join in future calls
- Provide HPC capabilities and mod / sim expertise
- Partner with industry to develop full proposal
- < \$300k DOE funding
- DOE Model Short Form CRADA

US Manufacturing losing market share and large energy consumer

A limited number of Phase II projects may be considered

Program Details: Eligibility and Funding

- Eligibility for call
 - Companies manufacturing in the US
 - Manufacturing-supporting organization
 - US Universities
- Who can be funded from the program
 - LLNL, LBNL, ORNL
 - In limited amounts, US Universities
- Industry participant cost share
 - At least 20% of project funding
 - Can be used to support internal staff
 - Source can not be other federal funding
 - Waiver available for qualified universities

Program Details: DOE Model Short Form CRADA

- Used for accelerated placement and execution
- Scope and IP protection defined
- Awardees expected to sign DOE Model Short Form CRADA
- Objections to terms and conditions can be stated in concept paper, however this could lead to delays and rejection of proposal

Program Details: What types of projects are acceptable

- Broad impact on energy efficiency. These can include
 - existing process optimization
 - advanced product design
 - predicting performance and failure rates
- Accelerating adoption of clean energy technologies. These can include new design and discovery on products or processes that impact energy use. Examples include new materials that
 - lower carbon release into atmosphere during use
 - lower energy during manufacturing.

Examples on next page

Consumer Products: Reduced Costly Experiments; Increased Understanding of Product Shelf Life



Phase separation & stability of fabric enhancer.

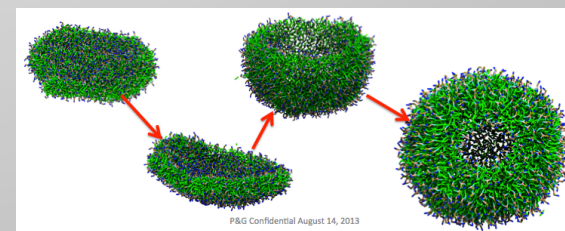
Challenge:

- Lipids and vesicles (lipid bi-layers rolled up into a fluid-filled sac) are fundamental to many personal care & laundry products.
- Currently, P&G must perform expensive experiments because it can not predict lipid-system performance.

Solution: Use HPC to understand lipid-system performance, aging, and the impact of additives (e.g. perfumes and dyes) on product performance by simulating the molecular structure and dynamics of lipid vesicles and measuring the impact additives.

Outcome:

- Verified molecular additives cause significant change in elastic properties of vesicles (elastic properties dictate the size, shape and stability of vesicles).
- Using to explain fabric enhancer aging behavior for longer shelf life.

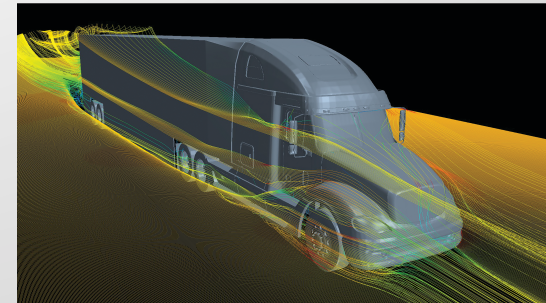


“It would us take 2 or 3 years to do in-house what we can do in a couple of months [on Titan].” — Russell DeVane, P&G

Aerodynamic simulations guide truck designs with realized impact on reduced fuel usage

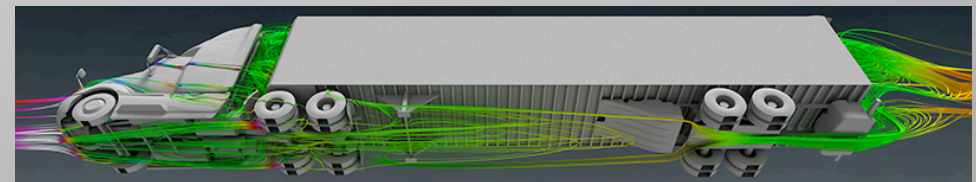
Combinations of internal research and “Super Truck” collaborations enabled LLNL to develop truck designs found on the roads today

- Aerodynamic drag reduction: 15% fuel reduction
5.1 billion gallons of diesel fuel, 52 million tons of CO2 emission,
\$21 billion saved/year
- Aerodynamic and wide-based single tire: 19% fuel reduction
6.5 billion gallons of diesel, 66 million tons of CO2 emission,
\$26 billion saved/year
- Tractor-Trailer integration fuel use reduction
Aerodynamics > 25%
With wide-based tire > 29%



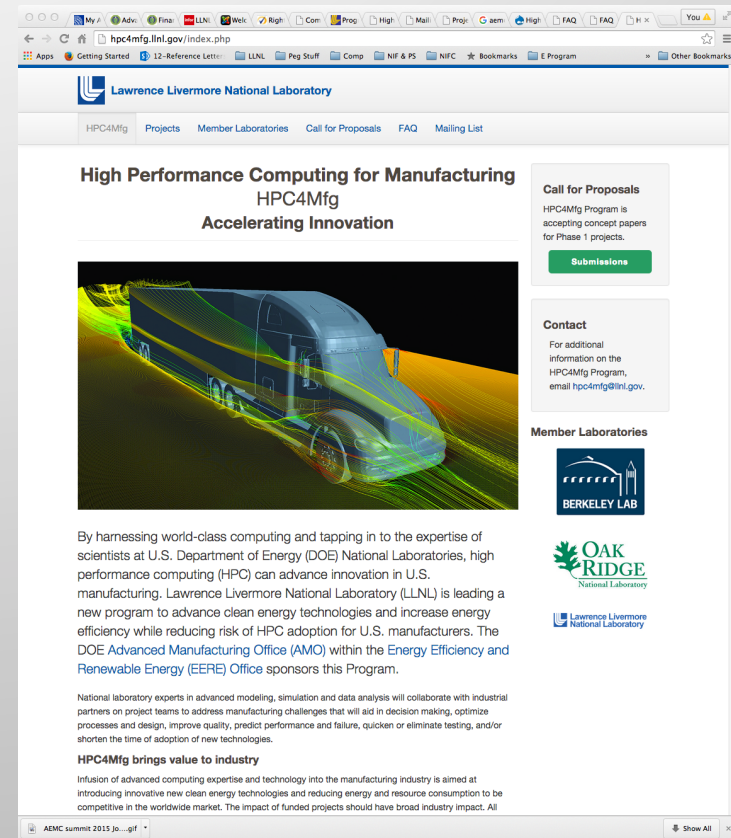
ORNL partnered directly with SmartTruck to determine type and design of add-on parts to substantially reduce drag / increase aerodynamic efficiency.

- New add-on parts demonstrated fuel mileage improvements of 5.5% to 10%.
- Reduced conception to product time by 50%



For more information on the HPC4Mfg Program

- Access hpc4mfg.llnl.org
- Join the hpc4mfg-info@llnl.gov distribution list via the web to receive program announcements
- Contact hpc4mfg@llnl.gov



The screenshot shows the HPC4Mfg Program website. The header includes the LLNL logo and navigation links: HPC4Mfg, Projects, Member Laboratories, Call for Proposals, FAQ, and Mailing List. The main content area features the title "High Performance Computing for Manufacturing HPC4Mfg Accelerating Innovation" and a central image of a semi-truck with green and yellow motion blur. To the right, there are three boxes: "Call for Proposals" with a "Submissions" button, "Contact" with an email address, and "Member Laboratories" with logos for Berkeley Lab, Oak Ridge National Laboratory, and Lawrence Livermore National Laboratory. Below the image, there is a paragraph of text describing the program's goals and a section titled "HPC4Mfg brings value to industry" with a brief description of the program's impact.

Q & A

- Please mute your phone when not speaking
- Questions: Send to "Everyone" via Chat
- Please "raise your hand" (hand icon) if you would like to join the dialogue and I will call on you



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