

Agenda

**American Energy & Manufacturing
Competitiveness Partnership: Dialogue 7**
Accelerating Advanced Materials Manufacturing

June 25th, 2015

Hosted by: **Dr. Peter Littlewood**
Director
Argonne National Laboratory

Mr. David Mohler
Deputy Assistant Secretary, Clean Coal and Carbon Management
Office of Fossil Energy
U.S. Department of Energy

Location: **Advanced Photon Source
Building 401, Rm. A5000**
Argonne National Laboratory
Lemont, IL

Note: **Please see attached map and directions.**

<http://www.anl.gov/directions-and-visitor-information>

If arriving **before 5:00 pm on June 24th** (staying overnight at Argonne Guest House), please proceed to the Argonne Information Center to pick up your gate pass. If arriving **after 5:00 pm on June 24th** please proceed to the Argonne Main Gate to pick up your gate pass.

If arriving on June 25th, please proceed to the Argonne Information Center to pick up your gate pass.

DOE HSPD-12 badges do not require gate passes—your DOE badge will be sufficient.

Time: 8:00 a.m. – 4:30 p.m.

Contacts: Drew Steigerwald 740-816-3142
Chad Evans 703-945-7917

Wi-Fi: **TBD**

8:00 a.m. Registration and Light Breakfast

8:30 a.m. Welcome and Opening Remarks

Mr. Chad Evans

Executive Vice President
Council on Competitiveness

Dr. Peter Littlewood

Director
Argonne National Laboratory

Mr. David Mohler

Deputy Assistant Secretary, Clean Coal and Carbon Management
Office of Fossil Energy
U.S. Department of Energy

9:00 a.m. Briefing on the Goals and Objectives of the Clean Energy Manufacturing Initiative (CEMI)

This session will describe the thrusts and new developments in the Department of Energy (DOE) Clean Energy Manufacturing Initiative (CEMI), created in the Office of Energy Efficiency and Renewable Energy (EERE) and joined by the Offices of Fossil Energy (FE) and Nuclear Energy (NE). This overview will highlight the critical role of advanced materials—and in particular, a national initiative around accelerating the manufacturing of such materials—plays in achieving the overarching goals of CEMI.

Mr. Reuben Sarkar

Deputy Assistant Secretary for Transportation
Office of Energy Efficiency & Renewable Energy
Executive Director, CEMI
U.S. Department of Energy

9:15 a.m. Understanding Materials in Extreme Environments at Argonne National Lab

DOE has a vested interest in understanding the design, development, and deployment of advanced materials—in particular those that exist and operate in extreme environments or under harsh conditions. These materials enable technologies that cross-cut DOE—applications such as novel catalysts for advanced fuel cell technology, extreme tolerance to photon and particle fluxes, advanced reactor and fuel cycle technologies, energy storage for the electric transportation grid, and others. This session will give an overview of how DOE's unique user facilities, like Argonne's Advanced Photon Source and the Center for

Nanoscale Materials, are working in concert to accelerate discovery and bring these technologies into the marketplace.

Dr. Stephen Streiffer

Associate Laboratory Director, Photon Sciences
Argonne National Laboratory

9:30 a.m. Identifying Common Challenges

Moderator: **Dr. Mark Johnson**

Director, Advanced Manufacturing Office
Office of Energy Efficiency & Renewable Energy
U.S. Department of Energy

Advanced materials includes a wide range of materials, applications and processes—from nanoscale films and coatings, to advanced alloys and composites, to innovative recycling processes. In spite of this diversity, a number of common challenges exist that—if addressed—could accelerate the development and deployment of a wide range of materials and technologies into the marketplace.

In this opening session, participants will introduce themselves and discuss what—from their perspective—are the most significant challenges to furthering the manufacturing of advanced materials in the U.S.

Questions to consider:

- What does the term “advanced materials” mean to you and your organization?
- How do you see your role in the research, development and deployment of advanced materials and materials-based technologies?
- What challenges do you perceive as being barriers to the manufacturing scale-up and deployment of advanced materials and what are potential solutions?

10:30 a.m. Coffee Break

10:45 a.m. Aligning Resources and Capabilities with Needs

Moderator: **Dr. Matthew Tirrell**

Dean and Founding Pritzker Director
The Institute for Molecular Engineering
University of Chicago

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Three barriers have been identified as impediments to the scale-up and deployment of new materials—access to capital at critical points in technology development, access to shared infrastructure, and high technical risk. These issues are particularly relevant to extreme environment materials, where non-equilibrium conditions can lead to greater uncertainties and new behaviors. In this session participants will develop specific recommendations that could—if implemented—facilitate quicker development and market diffusion of new materials.

Questions to consider:

- As new materials are developed, where is access to capital most constrained? What would facilitate more private sector investment at these critical points? What other financing mechanisms should be considered?
- What would shared infrastructure capable of benefiting a broad class of materials look like? What is needed to be able to address challenges specifically related to the manufacturing of new materials?
- What other approaches—beyond financing tools—can help to derisk investments in the scale-up of new materials?

Kickoff Discussants:

Mr. Adam Khan
Founder and CEO
AKHAN Semiconductor

Dr. Roger England
Director, Materials Science & Technology, Intellectual Property, and Technical Quality
Cummins, Inc.

Mr. Mike Froehlich
Global Technology Manager, Advanced Mechanical Technologies
Eaton Corporation

12:00 p.m. Working Lunch (and Tour)

1:30 p.m. Shortening the RD&D Cycle: The Role of Predictive Modeling

Moderator: **Dr. Peter Littlewood**
Director
Argonne National Laboratory

Many researchers and companies are accustomed to designing, developing, and deploying materials based on experiments and experience. Incorporating virtual materials design (VMD) and testing into this process has the potential to accelerate this cycle by informing the search for new classes of materials with specific behaviors that will perform under extreme conditions. In this session participants will share their perspective on the potential of predictive modeling and what can be done to spur its wider adoption.

Questions to consider:

- How do you view the potential of VMD in your own line of work? What barriers (awareness, access, usefulness) have you observed in its application?
- What can be done to spur wider adoption and use of VMD in the testing and design cycle? What is DOE's role in this?
- What existing resources could be leveraged to drive greater use of VMD in the private sector? What specific steps need to be taken to realize this?

Kickoff Discussants:

Dr. Peter Voorhees

Co-Director, Northwestern Argonne Institute for Materials Science and Engineering
Co-Director, NIST Center for Hierarchical Materials Design
Northwestern University

Dr. Glenn Fox

Associate Director, Physical and Life Sciences Directorate
Lawrence Livermore National Lab

2:15 p.m. Mitigating Risk: The Role of Materials Certification and Qualification

Confidence in the property of a novel material—how it will perform under a range of temperatures and pressures, across hundreds of thousands of cycles, in a radiative environment—is essential to its market uptake. Facilitating this process, anticipating these concerns earlier in the scale-up process, and providing this capability to small firms could dramatically accelerate the manufacturing of new classes of materials. This session will explore actionable recommendations to provide greater certification and qualification capabilities across the advanced materials sector.

Moderator: **Mr. Regis Conrad**
Director, Division of Crosscutting Research
U.S. Department of Energy

Kickoff Discussants:

Mr. Vito Cedro

Project Manager, Crosscutting Division
National Energy Technology Laboratory

Mr. Paul Fakes

Senior Government Relations Representative
ASME

2:45 p.m. Coffee Break

3:00 p.m. Accelerating Advanced Materials Manufacturing Next Steps

Moderator:

Mr. David Mohler

Deputy Assistant Secretary, Clean Coal and Carbon Management
Office of Fossil Energy
U.S. Department of Energy

Accelerating the manufacturing of new materials—and extreme environment materials in particular—requires overcoming a range of technical and non-technical barriers. Based on conversation throughout the day, this session will explore different structures for a public-private partnership (PPP) or national initiative that would drive the manufacturing of extreme environment materials in the United States.

Questions to consider:

- What are the key elements of a PPP or national initiative that would address key challenges facing manufacturing of extreme environment materials?
- What gaps—financing, policy, technology or otherwise—could be immediately addressed through such an effort?
- What are the necessary next steps in developing a roadmap and milestones? What are the markers of success for a national initiative?
- How can we ensure a PPP or national initiative engages and benefits all sizes of companies and types of organizations?

Kickoff Discussants:

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Dr. Leo Christodoulou

Director, Structures and Materials, Enterprise Operations and Technology
The Boeing Company

Dr. Steve Visco

CEO, CTO and Founder
PolyPlus Battery

Dr. Bill Peter

Deputy Director, Manufacturing Demonstration Facility
Oak Ridge National Laboratory

4:00 p.m. The Path Forward

Mr. David Mohler

Deputy Assistant Secretary, Clean Coal and Carbon Management
Office of Fossil Energy
U.S. Department of Energy

Mr. Chad Evans

Executive Vice President
Council on Competitiveness

4:15 p.m. Conclude and Reception