Summary Minutes of the

U.S. Department of Energy (DOE)
Commission to Review the Effectiveness of the National Energy Laboratories
Public Meeting

Commission Members in Attendance:	TJ Glauthier, Co-Chair; Jared Cohon, Co-Chair; Norman Augustine, Wanda Austin; Paul Fleury; Cherry Murray
Date and Time:	9:00 AM – 2:20 PM, November 4, 2014
Location:	Theory and Computing Sciences Conference Center (Building 240), Argonne National Laboratory, 9700 S. Cass Ave, Argonne IL 60436
Purpose:	Meeting of the Commission to Review the Effectiveness of the National Energy Laboratories
Presenters:	Speakers **National Laboratories Director Panel** Peter Littlewood, Director, Argonne National Laboratory Nigel Lockyer, Director, Fermi National Accelerator Laboratory **Industry Partners Panel** Michael G. Andrew, Director of Academic and Technical Programs, Advanced Products and Materials, Johnson Controls Power Solutions Michael A. Fetcenko, Vice President and Managing Director, BASF Battery Materials Ovonic, BASF Corporation Adam Kahn, Founder and CEO, AKHAN Technologies, Inc. Brian Landes, Technology Leader, Dow Chemical Company Stephen R. Wasserman, Director, LRL Collaborative Access Team, Senior Research Fellow, Discovery Chemistry Research & Technologies, Lilly Research Laboratories, Eli Lilly and Company Stephen E. Zimmer, Executive Director, United States Council for Automotive Research (USCAR) **University Partners Panel** Jeffrey Binder, Director of the Applied Research Institute, University of Illinois at Urbana-Champaign Thomas Glasmacher, Facility for Rare Isotope Beams (FRIB) Project Manager, Michigan State University Matt Tirrell, Pritzker Director and Professor, Institute for Molecular Engineering, University of Chicago
DOE Staff:	Karen Gibson, Designated Federal Officer; Dimitri Kusnezov, Senior Advisor
IDA & STPI Staff:	Mark Taylor; Susannah Howieson; Libby Turpen; Susan Clark-Sestak; Robert Mahoney; Martha Merrill; Julian Zhu

Meeting Summary

The Commission to Review the Effectiveness of the National Energy Laboratories (Commission) was convened for its fourth meeting at 9:00 AM on November 4, 2014. The meeting included three panels: directors of ANL and FermiLab, industry partners, and university partners. Each panel consisted of testimony from the panelists followed by discussion with the commission. The lab directors gave an overview of their individual labs as well as how those labs fit into the overall Department of Energy laboratory complex. The representatives from industry provided insight into how their companies work with the National Laboratories and recommendations as to how the laboratory-industry relationship could improve. The university partners provided perspective on a user facility run by a university, the interactions between universities and the National Laboratories, and the ways in which the two types of institutions differ. The next meeting will be held December 15th at the Institute for Defense Analysis in VA.

Opening of Public Meeting

Co-Chair T.J. Glauthier opened the meeting and welcomed the commissioners, speakers, and observers.

National Laboratories Director Panel

Peter Littlewood, Director of Argonne National Laboratory, gave a high level overview from the Lab perspective of how the labs fit together as a network and how they map onto the mission areas of DOE (energy, science, environment, and security). He emphasized the distinctive capabilities and roles in the innovation system of the 17 National Labs and how they have the depth of expertise to work on complex and urgent problems. He described Argonne's multidisciplinary, multi-programmatic work including advance photon source, computing, nuclear power, and nanoscale materials. He also talked about Argonne's physical framework – new buildings, user facilities, and aging infrastructure.

Nigel Lockyer, Director of FermiLab, described DOE's role as a champion for basic discovery science and how DOE is mission driven, which is different from other agencies. He noted that DOE's Office of High Energy Physics is the national steward for particle physics and accelerator science and technology. He described FermiLab's unique capabilities and how they foster international, inter-lab, and university connections. FermiLab recently went through a P5 planning process that provides a roadmap from the community for the single program Lab. FermiLab's scientific strategy includes pursuing exciting science that pulls in the best minds, maintains the technological edge in core areas, and mounts leading experiments that are competitive in timescale and scope.

A Q&A session followed.

Industry Partners Panel

Michael G. Andrew, Director of Academic and Technical Programs, Advanced Products and Materials, Johnson Controls Power Solutions, described their rich history with lab system, and in particular with Argonne, Sandia, NREL, and PNNL. He noted that the richness of the lab network is in the people. Andrew described a number of successful programs with the labs on advancing the state of technology readiness for zinc bromine technology, on lithium ion power cell technology in commercial use. He suggested that an annual or semi-annual program between industry and the lab network would help industry better understand the capabilities of the National Labs would help industry and the lab network interface more efficiently. He also suggested that the IP process and time for legal reviews can be hurdles to working with the lab complex and that shortening the approval times for WFO and CRADAs would help. Finally, Andrew recommended shortening the time horizon for the applied R&D programs and driving an idea to commercialization.

Michael A. Fetcenko, Vice President and Managing Director, BASF Battery Materials Ovonic, BASF Corporation described how BASF is proud of their relationship with the DOE Labs. He noted that the relationship is people-based, not just technical know-how, and the business interface is professional and savvy, understanding what industry partners need. The focus of the collaboration with ANL is on batteries and energy storage and on a number of other areas. Together they do fundamental research, but the goal is commercialization. They are working with the labs on commercial materials today, but also on next generation materials that take costs down further. The labs do the groundbreaking fundamental science, and industry does the applied development and works with the end use customers. Fetcenko also noted the effective IP collaboration and the high value of the collaboration with the national labs.

Adam Kahn, Founder and CEO, AKHAN Technologies, Inc., described the two-year collaboration between AKHAN, a user of user facilities at the Center for Nanoscale Materials (CNM), and ANL as successful. The collaboration is through a Cooperative Research and Development Agreement (CRADA). Their major focus is on Wide Band Gap semiconductors and incorporating new technology to meet the needs of the market for faster supercomputers. Initially long lead times for CRADAs were a challenge (greater than 4 months), especially for small businesses, but the new short form CRADA is an improvement. He noted their benchmarks include successful user proposals and CRADA, 2 new patents, 3 published papers, awards, and new products in development. Areas for improvement include research aimed around well identified problem sets with private/public funding well ear-marked where Intellectual Property (IP) generated is independently valuable; and outreach, including case studies of successful lab to fab deployment of technology and IP.

Brian Landes, Technology Leader, Dow Chemical Company, noted that issues do not just occur on the lab side. Challenges are often in matching synergies of systems between industry and the national labs. He shared reasons that Dow uses the labs: technology and the ability to do experiments that cannot be done elsewhere; expertise and the relationship with the scientific community; network within the labs, but also between the labs and externally; and talent, especially young students. Labs have a convening authority to bring together key players to determine the future. Suggestions for improvement included bringing together key players and mapping out what the future holds; fast-tracking and harmonizing processes across the complex; faster access for proprietary proof-of-concept research, and flexibility to terminate projects in a variety of ways. Current barriers include: identifying synergies of the organization; preference to work on non-proprietary endeavors and the need to publish in the scientific community; shifting priorities of the DOE and the market. One suggestion was to have more frequent and different opportunities for industry and labs to get together to talk about metrics and better understand and measure investment. DOW would like to increase collaboration with the national labs in tackling grand challenges.

Stephen R. Wasserman, Director, LRL Collaborative Access Team, Senior Research Fellow, Discovery Chemistry Research & Technologies, Lilly Research Laboratories, Eli Lilly and Company, share that despite the fact that biology is not a core mission of DOE, Eli Lilly has worked successfully with the labs. They firmly believe that the labs improve people's lives. Eli Lilly is a major user of the advanced photon source (APS). He made the comparison to international facilities such as Diamond light source (UK), ESRF (France), and Canadian light source, where they will do the experiments for the industry without impact to ownership of IP. At US user facilities, the dedicated staff is minimal and they won't do the experiment for the customer. The DOE Master User Agreement is much more onerous and can be daunting to new users. However, industry knows that APS is the place to go.

Stephen E. Zimmer, Executive Director, United States Council for Automotive Research (USCAR), described USCAR, the collaborative technology research company for Chrysler Group LLC, Ford Motor Company, and General Motors Company. USCAR works with DOE and the national labs to jointly develop technology goals, identify technical gaps, review projects, and complete annual reports. They look at the portfolio of vehicle technology and fuel cells and provide feedback; and do periodic lab capability assessments. What's in it for the car companies? They gain knowledge – labs contribute high-risk, long-term, basic science research to commercialization process; and some tech migrates back to the companies. Tech capabilities are valuable and well-coordinated – advanced combustion and fuels, vehicle electrification, lightweight materials, fuel cells, crosscutting technology. Areas for improvement include developing more commercially competitive price structure at lab user facilities; reducing the response time to user requests; modifying the publication requirements of joint-funded projects; and adapting licensing structure that benefits US industry and economy.

A Q&A session followed.

University Partners Panel

Thomas Glasmacher, Facility for Rare Isotope Beams (FRIB) Project Manager, Michigan State University, described FRIB as funded by financial assistance from DOE Office of Science with cost share and contributions from Michigan State. The total project cost is $730M. MSU sees FRIB as enhancement to the MSU brand, and they are committed to success. MSU operates another user facility with NSF (National Superconducting Cyclotron Laboratory) under cooperative agreement since 1960s. To work with external regulators, the process needs to be transparent to maintain trust between both parties. The Cooperative Agreement between DOE-SC and MSU is governed by a Project Execution Plan (PEP) and is tailored for the construction of FRIB. He described the elements of the FRIB Cooperative Agreement and the special terms and conditions, noting that complex construction projects have unique features that must be accommodated. There are also multiple stakeholders with expectations that must be met (DOE, MSU, Congressional appropriations, OMB, etc.).

Jeffrey Binder, Director of the Applied Research Institute, University of Illinois at Urbana-Champaign, described how ARI was created by the university to focus on translation of technology into the marketplace. The premise was to start with a big problem and see where to focus capabilities from the university. Universities have traditionally worked as contractors for the labs, but more recently the collaborations have been more involved through the creation of joint opportunities and joint positions. Hubs have been a successful method of collaboration. However, CRADAs and WFO are rather 'clunky' in terms of getting the labs to work closely with industry. Differences between the labs and university include cultural considerations – the university research portfolio is driven by research faculty; and contracting flexibility within the university is greater than at the national labs. The research landscape in the US is shifting and we don't have the investment in the corporate level. How universities and labs work together is important. National labs can provide the bigger context for university based research. They can also bring together groups to address the bigger problems.

Matt Tirrell, Pritzker Director and Professor, Institute for Molecular Engineering, University of Chicago, described how the national lab connection helps with outward focus. IME has a unique role in bridging the campus and the laboratory. There are special research opportunities – large, collaborative projects and unique facilities in computation that are attractive to faculty. Collaborating with the national labs provides an avenue for universities to contribute to broad national efforts in areas such as energy, environment, water, materials, and synthetic biology that they might not be able to do on their own.

National labs provide facilities in x-ray scattering, neutron scattering, and electron microscopy that no university could have of that quality or scope. Joint university-lab hiring and appointments are uniquely effective for both institutions and the integrated connection has enabled the Institute to attract people.

A Q&A session followed.

Public Comment
No public comment

Meeting adjourned at 2:20 PM.

Respectfully Submitted:

Karen Gibson, Designated Federal Officer

I hereby certify that these minutes of the November 4, 2014 Lab Commission meeting are true and correct to the best of my knowledge.

TJ Glauthier
Co-Chair

Jared Cohon
Co-Chair