

RECOMMENDATIONS OF THE COMMISSION  
TO REVIEW THE EFFECTIVENESS  
OF THE NATIONAL ENERGY LABORATORIES

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HEARING  
BEFORE THE  
SUBCOMMITTEE ON ENERGY  
COMMITTEE ON SCIENCE, SPACE, AND  
TECHNOLOGY  
HOUSE OF REPRESENTATIVES  
ONE HUNDRED FOURTEENTH CONGRESS  
FIRST SESSION

November 18, 2015

**Serial No. 114-51**

Printed for the use of the Committee on Science, Space, and Technology



Available via the World Wide Web: <http://science.house.gov>

U.S. GOVERNMENT PUBLISHING OFFICE

97-770PDF

WASHINGTON : 2017

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**RECOMMENDATIONS OF THE COMMISSION  
TO REVIEW THE EFFECTIVENESS  
OF THE NATIONAL ENERGY LABORATORIES**

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**WEDNESDAY, NOVEMBER 18, 2015**

HOUSE OF REPRESENTATIVES,  
SUBCOMMITTEE ON ENERGY  
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY,  
*Washington, D.C.*

The Subcommittee met, pursuant to call, at 2:05 p.m., in Room 2318 of the Rayburn House Office Building, Hon. Randy Weber [Chairman of the Subcommittee] presiding.

LAMAR S. SMITH, Texas  
CHAIRMAN

EDDIE BERNICE JOHNSON, Texas  
RANKING MEMBER

**Congress of the United States**  
**House of Representatives**

COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY

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**Subcommittee on Energy**

***Recommendations of the Commission to Review the  
Effectiveness of the National Energy Laboratories***

Wednesday, November 18, 2015

2:00 p.m. – 4:00 p.m.

2318 Rayburn House Office Building

Witnesses

**Mr. T.J. Glauthier**, Co-Chair, Commission to Review the Effectiveness of the National Energy Laboratories

**Dr. Jared Cohon**, Co-Chair, Commission to Review the Effectiveness of the National Energy Laboratories

**Dr. Peter Littlewood**, Director, Argonne National Laboratory

**U.S. HOUSE OF REPRESENTATIVES  
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY  
SUBCOMMITTEE ON ENERGY**

**HEARING CHARTER**

*Recommendations of the Commission to Review  
the Effectiveness of the National Energy Laboratories*

**November 18, 2015  
2:00 p.m. – 4:00 p.m.  
2318 Rayburn House Office Building**

**Purpose**

The Energy Subcommittee will hold a hearing titled *Recommendations of the Commission to Review the Effectiveness of the National Energy Laboratories* on November 18 at 2:00 p.m. in room 2318 of the Rayburn House Office Building. The hearing will examine key recommendations from the Commission to Review the Effectiveness of the National Energy Laboratories (the Commission) in their report *Securing America's Future: Realizing the Potential of the Department of Energy's National Laboratories* (the Report).<sup>1</sup>

**Witnesses**

- **Mr. TJ Glauthier**, Co-Chair, Commission to Review the Effectiveness of the National Energy Laboratories
- **Dr. Jared Cohon**, Co-Chair, Commission to Review the Effectiveness of the National Energy Laboratories
- **Dr. Peter Littlewood**, Director, Argonne National Laboratory

**Background**

Pursuant to direction in the Consolidated Appropriations Act of 2014, the Secretary of Energy established the Commission<sup>2</sup> to undertake an in-depth review of the overall effectiveness of the Department of Energy (DOE) laboratory system. The DOE laboratory complex comprises seventeen laboratories across the United States.<sup>3</sup> These laboratories employ approximately 55,000 people and received \$14.3 billion in fiscal year 2014 (\$11.7 billion from DOE and \$2.6 billion from other sources).<sup>4</sup> On October 28, 2015, the Commission released its final report incorporating public comments titled “Securing America’s Future: Realizing the Potential of the

<sup>1</sup> *Securing America's Future: Realizing the Potential of the Department of Energy's National Laboratories* (the Report), Vol. 2, Technical Chapters and Appendices can be found at:

[http://energy.gov/sites\\_prod/files/2015/10/127/Final%20Report%20Volume%202.pdf](http://energy.gov/sites_prod/files/2015/10/127/Final%20Report%20Volume%202.pdf)

<sup>2</sup> Consolidated Appropriations Act, 2014, §319.

<sup>3</sup> Of the 17 labs, 10 are Office of Science labs, 3 are national security labs overseen by the National Nuclear Security Administration, and 4 are DOE applied labs stewarded by the applicable DOE program office.

<sup>4</sup> “Securing America’s Future: Realizing the Potential of the Department of Energy’s National Laboratories”, Vol. 2 at page 1.

Department of Energy's National Laboratories" (the Report). The Commission found that the DOE lab complex provides critical, long-term R&D capabilities to the nation that cannot be carried out solely by academic institutions or the private sector.<sup>5</sup> Accordingly, the Commission's first recommendation reflects these findings.

***Recommendation 1:** The National Energy Laboratories provide great value to the Nation in their service to DOE's mission, the needs of the broader national S&T community, and the security needs of the Nation as a whole. The Administration and Congress should provide the necessary resources to maintain these critical capabilities and facilities. It would also benefit all stakeholders if the key committees in Congress would develop a more orderly process of reviewing the National Laboratories, to replace the unrelenting pace of studies evaluating the performance of the DOE laboratories. For example, Congress could initiate a comprehensive review of the entire laboratory system in predetermined intervals.<sup>6</sup>*

#### **The Relationship between the DOE and its Labs**

DOE has organized sixteen of its seventeen labs as federally funded research and development centers (FFRDCs) where DOE owns the lab and a contracting organization manages day-to-day operations. This relationship is meant to allow expert organizations to manage the labs while remaining accountable for their performance. The Commission found that the FFRDC model can achieve optimal performance when the operator and sponsoring agency have a relationship built on trust and free of multi-stage transactional burdens. According to the Commission, the current relationship between DOE and many of its labs is less than satisfactory.<sup>7</sup>

***Recommendation 2:** Return to the spirit of the FFRDC model (stewardship, accountability, competition, and partnership). DOE and the National Laboratories must work together as partners to restore the ideal nature of the FFRDC relationship as a culture of trust and accountability. DOE should delegate more authority and flexibility to the laboratories on how to perform their R&D, and hold them fully accountable for their actions and results. For their part, to be trusted partners and advisors, the laboratories must be transparent with DOE about their planned activities ahead of time, as well as about their actions and results as they are carried out.<sup>8</sup>*

#### **Laboratory-Directed Research and Development**

Laboratory-Directed Research and Development (LDRD) gives lab directors discretion based upon their first-hand knowledge of the direction for potential cutting-edge research to identify and fund research projects. Yet LDRD still requires that DOE approve all projects under this program. The key distinction is that under this program the labs which conduct research are

<sup>5</sup> "Securing America's Future: Realizing the Potential of the Department of Energy's National Laboratories", Vol. 2 at page 5.

<sup>6</sup> *Id.* at page 14.

<sup>7</sup> *Id.* at 18.

<sup>8</sup> *Id.* at 179.



able to put forth proposals. LDRD funds reportedly built foundational expertise necessary to implement the Joint Center for Energy Storage Research (JCESR) at Argonne National Lab and the Joint Bioenergy Institute (JBEI) at Lawrence Berkeley Lab among others.<sup>9</sup> According to the Report, the Commission finds that mandatory DOE review of each individual project “may be excessively costly and burdensome to both Departmental and laboratory staff.”<sup>10</sup> The Commission also found that LDRD is crucial to recruiting and retaining top tier researchers, especially at National Nuclear Security Administration laboratories.<sup>11</sup> Currently, LDRD funds are limited to 6 percent (burdened) of each lab’s R&D budget.<sup>12</sup>

***Recommendation 19:** The Commission strongly endorses LDRD programs, both now and into the future, and supports restoring the cap on LDRD to 6 percent unburdened, or its equivalent. The Commission recognizes that, in practice, restoring the higher cap will have the largest impact on the LDRD programs of the NNSA laboratories.*<sup>13</sup>

### **Partnering with Industry**

The DOE labs partner with the private sector through multiple channels, including cooperative research and development agreements (CRADAs), licensing agreements, user facility agreements, and technical training.<sup>14</sup> Since the 1980s, the labs have been formally responsible to support technology transfer to the private sector while government and public support for this concept have varied.<sup>15</sup> Under the Energy Policy Act of 2005, the Department established a technology transfer coordinator, technology transfer working group, and energy technology commercialization fund to support R&D partnerships between the labs and the private sector.<sup>16</sup> Yet, the Commission found that barriers to partnership between the labs and small businesses persist, including the complexity of contractual terms for partnerships, extended delay for negotiation and DOE approval of contracts, and a high transactional cost for collaboration in part due to advanced funding requirements.

***Recommendation 25:** All DOE programs and laboratories should fully embrace the technology transition mission and continue improving the speed and effectiveness of collaborations with the private sector. Innovative technology transfer and commercialization mechanisms should continue to be pursued and best practices in other sectors, including academia, should be examined.*<sup>17</sup>

<sup>9</sup> “Securing America’s Future: Realizing the Potential of the Department of Energy’s National Laboratories”, Vol. 2 at page 179. See also *Id.* at page 183, footnote 232 “Burdened” means overhead is charged to LDRD projects.

<sup>10</sup> *Id.* at 175.

<sup>11</sup> The NNSA laboratories responsible for maintaining the nuclear weapons stockpile are Los Alamos National Laboratory, Lawrence Livermore National Laboratory, and Sandia National Laboratories.

<sup>12</sup> Consolidated Appropriations Act, 2014, §309.

<sup>13</sup> “Securing America’s Future: Realizing the Potential of the Department of Energy’s National Laboratories,” Vol. 2 at page 185.

<sup>14</sup> *Id.* at page 203.

<sup>15</sup> *Id.* at 204.

<sup>16</sup> Energy Policy Act of 2005, §1001.

<sup>17</sup> “Securing America’s Future: Realizing the Potential of the Department of Energy’s National Laboratories,” Vol. 2 at page 213.

### **Ensuring Results**

The Commission recognizes that many other groups have studied this subject and made similar recommendations without seeing their efforts realized. The Commission noted its concern that “despite the extensive examination of these issues, none of these reports has led to the comprehensive change necessary to address the well-documented, persistent challenges confronting the Department and its laboratories.”<sup>18</sup> The Commission’s final recommendation calls for a mechanism to ensure meaningful change.

***Recommendation 36 (emphasis added): A standing body should be established to track implementation of the recommendations and actions in this report, and to report regularly to DOE, the laboratories, the Administration, and the Congress on progress, results, and needed corrective actions. The standing body could assist Congressional committees in developing a rational plan for future evaluations of the DOE laboratories.***<sup>19</sup>

### **Supplemental Material**

- “Securing America’s Future: Realizing the Potential of the Department of Energy’s National Laboratories,” Vol. 1, Executive Report.
- “Securing America’s Future: Realizing the Potential of the Department of Energy’s National Laboratories,” Vol. 2, Technical Chapters and Appendices.

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<sup>18</sup> “Securing America’s Future: Realizing the Potential of the Department of Energy’s National Laboratories”, Vol. 2 at page 289.

<sup>19</sup> *Id.* at page 297.

Chairman WEBER. The Subcommittee on Energy will come to order. Without objection, the Chair is authorized to declare a recess of the Subcommittee at any time.

Welcome to today's hearing entitled Recommendations of the Commission to Review the Effectiveness of the National Energy Laboratories. I now recognize myself for five minutes for an opening statement. Good morning, and as I said earlier, welcome to today's Energy Subcommittee hearing on the Recommendations of the Commission to Review the Effectiveness of the National Energy Labs. Today we will hear from the Commission's co-chairs Mr. TJ—is it Glauthier?

Mr. GLAUTHIER. Glauthier.

Chairman WEBER. Glauthier. I can do this—and Dr. Jerry Cohon as well as Dr. Peter Littlewood—thank you for having a simple name, Doctor—Director of Argonne National Laboratory regarding the extent to which the DOE lab system is working well and where it can improve.

Like many topics we discuss in the Energy Subcommittee, this one requires a thorough understanding of the details. Of the DOE's 17 national labs, ten are stewarded by the Office of Science for Basic Research, three by the National Nuclear Security Administration, or the NNSA, to maintain the nuclear weapons stockpile, and four by their respective DOE applied energy programs.

Each of the 17 labs has distinct characteristics and capabilities that bring a unique set of challenges when it comes to management, oversight, safety and security. For example, this summer I along with staff had the opportunity to visit the Savannah River National Lab along with some of my colleagues on the committee. The Savannah River complex is hundreds of square miles and houses critical infrastructure for the Nation's nuclear deterrent as well as facilities to support research subjects ranging from national security to environmental management.

As the witnesses will observe today, 16 of the 17 national labs are government-owned, contractor operated, which requires a certain degree of trust between owner and operator for us to achieve optimal results. That said, there is one fundamental question relevant to every subject we're likely to discuss today whether it's collaborative research with the private sector, technology transfer, laboratory-directed research and development, also known as LDRD, or safety and security. So the question is how much discretion should the DOE delegate to contractor operators while balancing the need to maintain DOE's oversight responsibilities? Ultimately we're debating a risk-reward concept that is familiar to Congress because we have to balance similar concerns when legislating federally sponsored research and development.

On the one hand, providing more discretion to the researchers allows them to pursue the most creative ideas without encumbrances. But on the other hand, too much discretion without effective oversight can lead to waste or misuse of taxpayer funds. And as I mentioned before, the 17 labs are very diverse so the approach for each lab should be distinct if we're going to get this right.

That said, I look forward today to the recommendations of this distinguished witness panel as we consider legislative options to

help the labs reach their full potential. Again, I thank the witnesses for their attendance, and I look forward to your testimony.  
[The prepared statement of Chairman Weber follows:]



COMMITTEE ON  
**SCIENCE, SPACE, & TECHNOLOGY**  
Lamar Smith, Chairman

For Immediate Release  
November 18, 2015

Media Contact: Zachary Kurz  
(202) 225-6371

**Statement of Energy Subcommittee Chairman Randy Weber (R-Texas)**

*Recommendations of the Commission to Review the Effectiveness of the National Energy Laboratories*

**Chairman Weber:** Good morning and welcome to today's Energy Subcommittee hearing on the Recommendations of the Commission to Review the Effectiveness of the National Energy Laboratories. Today, we will hear from the Commission's Co-Chairs Mr. TJ Glauthier and Dr. Jerry Cohon as well as Dr. Peter Littlewood, Director of Argonne National Laboratory regarding the extent to which the DOE lab system is working well and where it can improve.

Like many topics we discuss in the Energy Subcommittee, this one requires thorough understanding of the details. Of the DOE's 17 national labs, 10 are stewarded by the Office of Science for basic research, 3 by the National Nuclear Security Administration (NNSA) to maintain the nuclear weapons stockpile, and 4 by their respective DOE applied energy program offices.

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The question is: how much discretion should the DOE delegate to contractor-operators while balancing the need to maintain DOE's oversight responsibilities? Ultimately we're debating a risk-reward concept that is familiar to Congress, because we have to balance similar concerns when legislating federally sponsored research and development.

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That said, today I look forward to the recommendations of this distinguished witness panel as we consider legislative options to help the labs reach their full potential. Again, I thank the witnesses for their attendance, and I look forward to their testimony.

###

Chairman WEBER. And with that, I recognize Mr. Alan Grayson. Mr. GRAYSON. Thank you, Mr. Chairman, for holding this hearing today on a very important topic, our national laboratories and how to improve them. I'd also like to thank our witnesses for offering their expert recommendations and insights.

The United States invests more than any other nation in research and development, yet when you put that investment in context as a percentage of our GNP, it becomes much less impressive. Our R&D investment is stagnating, while other countries are seizing the opportunity to try to out-innovate the United States. China is currently on course to overtake the United States in actual R&D dollars spent sometime in the next decade.

However, the United States has an incredible innovation asset, our national labs. In order to take advantage of them, we must try to provide the national labs with the necessary resources not only to maintain and grow a vast array of facilities and equipment, but also to fund the exploratory research that produces results we may never have expected.

Beyond providing resources, the Commission to Review the Effectiveness of the National Energy Laboratories has offered a number of substantive recommendations in their report, and we're here to talk about them today. This Congress and this Administration can act on the Commission's recommendations quickly and make meaningful improvements to our network of national labs.

For years the relationship between the Department of Energy and the national labs has been a complicated one. The Commission has to find the means to try to improve that relationship—that was part of your charge—and make it more productive and effective. This motivation is apparent in a number of your recommendations, and I hope that the Department will take each and every one of those to heart.

Providing laboratories with increased levels of independence and freedom is bound to cause some transitional issues. But the result could be a more innovative atmosphere that provides scientists the freedom to produce groundbreaking outcomes.

The Commission's overall message is clear: The national labs are unique and irreplaceable. They must be a high priority in our budgetary decisions both now and in the future. I certainly will be a strong advocate myself on that point and I urge my colleagues to join me in that effort. Thank you again to the witnesses for being here today, and I yield back the balance of my time.

[The prepared statement of Mr. Grayson follows:]

**OPENING STATEMENT – Ranking Member Grayson**

Recommendations of the Commission to Review the Effectiveness of the National Energy  
Laboratories

November 18, 2015 - 2:00pm

Thank you, Mr. Chairman, for holding this hearing today on a very important topic, our national laboratories. I would also like to thank our witnesses for offering their expert recommendations and insights.

The United States invests more than any other nation in research and development, yet, when you put that investment in context as a percentage of our GDP, it becomes much less impressive. Over a number of Congresses and Administrations, we have failed to make the smart choices and long-term investments to maintain our position as a global leader in innovation. Our R&D investment is stagnating, while other countries are seizing on the opportunity to out-innovate the United States. China is currently on course to overtake the United States in actual dollars spent sometime in the next decade.

However, the United States has an incredible innovation network - our national labs. In order to take advantage of them, we must provide the national labs with the necessary resources to not only maintain and grow a vast array of facilities and equipment, but also to fund the exploratory research that produces results we may have never expected.

Beyond providing more resources, *the Commission to Review the Effectiveness of the National Energy Laboratories* has offered a number of substantive recommendations in their report, which we're here to talk about today. This Congress and this Administration can act on the Commission's recommendations immediately and make meaningful improvements to our network of national labs.

For years the relationship between the Department of Energy and the national labs has been a difficult one. The Commission attempted to find avenues to mend that relationship and make it more productive and effective. This motivation is apparent in a number of the recommendations, and I hope that the Department will take each one seriously.

Providing laboratories with increased levels of independence and freedom is bound to cause some transitional issues. But the end result could create a more empowered workforce and, if done correctly, a more innovative atmosphere that provides scientists the freedom needed to produce truly groundbreaking outcomes.

The Commission's overall message is clear: the national labs are unique and irreplaceable. They must be a high priority in our budgetary decisions both now and in the future. I will certainly be a strong advocate on that point and I urge my colleagues to join me in that effort.

Thank you again to the witnesses for being here today, and I yield back the balance of my time.



Chairman WEBER. Thank you, Mr. Grayson. I now recognize the Chairman of the Full Committee, Mr. Smith.

Chairman SMITH. Thank you, Mr. Chairman. Today we will hear recommendations from the Commission to Review the Effectiveness of the National Energy Laboratories. The Director of Argonne National Lab also will testify about his perspective on how the labs could operate more effectively.

The Committee on Science, Space, and Technology's jurisdiction over the country's "scientific research, development, and demonstration" makes possible American innovation and competitiveness. The Department of Energy is the largest federal supporter of basic research and sponsors 47 percent of federal basic research in the physical sciences.

The Department's science and energy research infrastructure at its 17 national labs and facilities are used by over 31,000 scientific researchers each year. The Commission to Review the Effectiveness of the National Labs was established by Congress to assess strategic priorities, unique capabilities, size, and accomplishments of this research network.

The Commissioners here today visited national labs, interviewed researchers and DOE officials, and compiled a detailed report with recommendations of how Congress and the DOE can ensure that national labs are able to reach their full potential.

Last month, the Commission released its final report. It found that the DOE lab system provides unique, long-term research capabilities that could not otherwise be reproduced by universities or the private sector. However, the Commission also found that the labs spend an excessive amount of time to navigate through government red tape created by the Department of Energy. Burdensome operating requirements can delay research projects and make it more difficult for researchers to pursue high-value science.

Congress has limited resources for research and development. We have a responsibility to ensure that taxpayer dollars are spent efficiently and effectively. To achieve the best return on investment for the American people, we must ensure the DOE labs are able to realize their full potential.

I thank our witnesses for their testimony today, and I look forward to a productive discussion about how we can improve our national labs. A primary goal of this Committee is to ensure that federal research and development is effectively directed. As we consider how to best direct the Department of Energy, we must focus on policies that enable breakthrough discoveries.

With improvements in the effectiveness of the national lab system, we can keep the best and brightest researchers here in the United States to continue to explore new ideas. This allows the national labs to provide the foundation for private sector development across the energy spectrum, create jobs, and grow the American economy.

Thank you, Mr. Chairman. I yield back.

[The prepared statement of Chairman Smith follows:]



COMMITTEE ON  
**SCIENCE, SPACE, & TECHNOLOGY**  
Lamar Smith, Chairman

For Immediate Release  
November 18, 2015

Media Contact: Zachary Kurz  
(202) 225-6371

**Statement of Chairman Lamar Smith (R-Texas)**

*Recommendations of the Commission to Review the Effectiveness of the National Energy Laboratories*

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This allows the national labs to provide the foundation for private sector development across the energy spectrum, create jobs, and grow the American economy.

###

Chairman WEBER. Thank you, Mr. Chairman. I'll now introduce our witnesses. Our first witness today is Mr. TJ Glauthier, Co-Chair on the Commission to Review the Effectiveness of the National Energy Laboratories and President of TJG Energy Associates. Welcome. Mr. Glauthier previously served as the Associate Director of OMB and Deputy Secretary and COO of the DOE under President Bill Clinton. Mr. Glauthier received his bachelor's degree in mathematics from Claremont McKenna College and his MBA from Harvard Business School.

Our next witness today is Dr. Jared Cohon, Co-Chair on the Commission and President Emeritus and university professor at Carnegie Mellon University. Dr. Cohon previously served as Chairman of the Nuclear Waste Technical Review Board from 1997 to 2002. Dr. Cohon received his bachelor's degree in civil engineering from the University of Pennsylvania and his Ph.D. in civil engineering from MIT.

And I now recognize the gentleman from Illinois, Mr. Lipinski, to recognize our final witness today, Dr. Peter Littlewood, Director of the Argonne National Lab. Congressman?

Mr. LIPINSKI. Thank you, Mr. Chairman. It's my pleasure to introduce Dr. Peter Littlewood, Director of Argonne National Laboratory. Dr. Littlewood came to Argonne in 2011 when he was appointed Associate Laboratory Director of Argonne's Physical Sciences and Engineering Directorate. He was appointed as Director last year. He is an internationally respected scientist who holds six patents, has published more than 200 articles, and has given more than 200 invited talks at conferences, universities, and laboratories. He is a fellow of the Royal Society of London, the Institute of Physics, and the American Physical Society.

Dr. Littlewood holds a bachelor's degree in natural sciences and a Ph.D. in physics both from the University of Cambridge. I want to welcome Dr. Littlewood today.

Chairman WEBER. Thank you, Mr. Lipinski. In lieu of giving separate statements, Mr. Glauthier has elected to give testimony on behalf of himself and Dr. Cohon, I understand. So I now recognize Mr. Glauthier for ten minutes to present that testimony.

**TESTIMONY OF MR. TJ GLAUTHIER,  
CO-CHAIR, COMMISSION TO REVIEW  
THE EFFECTIVENESS OF THE NATIONAL  
ENERGY LABORATORIES**

Mr. GLAUTHIER. Thank you, Mr. Chairman, and Ranking Member Greyson, other Members and staff of the Subcommittee and others here who are interested in the national laboratories. Dr. Cohon and I are happy to be here today to discuss the report of the Commission to Review the Effectiveness of the National Energy Laboratories. Congress created this Commission in the FY 2014 Omnibus Appropriations Act. The President's Council of Advisors on Science and Technology developed a list of potential nominees, and then the Secretary of Energy selected the nine Commissioners from that list. The two of us have served as the co-chairs of the Commission for almost 18 months, and we're privileged to serve with an outstanding group of Commissioners with strong backgrounds in the science and technology enterprise of the Nation.

We are pleased that this is a consensus report. We received excellent cooperation and support from the Department of Energy, all of the relevant Congressional committees, the White House, the National Laboratories themselves, and many others.

During the course of our work, we visited all 17 of the national laboratories, heard from 85 witnesses in monthly public hearings in the field and here in Washington and reviewed over 50 previous reports on this topic from the past 4 decades. We'll come back to that point in a little bit, 50 reports.

We have titled our report *Securing America's Future: Realizing the Potential of the National Energy Laboratories*. Our overall finding is that the national laboratory system is a unique resource that brings great value to the country in the four mission areas of the Department of Energy: nuclear security, basic science R&D, energy technology R&D, and environmental management.

For example, the national labs have four of the world's fastest supercomputers which are helping the Nation extend the lifetimes and safety of our nuclear warheads without nuclear testing. In basic science, their world-class particle accelerators, light sources, and other user facilities host over 30,000 researchers every year from our universities and industry partners. And in energy technology R&D, the labs have played an important role in helping to develop the innovations that have led to the Nation's shale gas revolution and surge in wind and solar energy.

However, our national lab system is not realizing its full potential. Our Commission believes that can be changed. We provide 36 recommendations that we believe, if implemented, will help the labs to become more efficient and effective and have even greater impact, thereby helping secure America's future in the four mission areas of the Department.

We'd like to highlight a few of our major findings and recommendations and then would be happy to address any others of particular interest to you.

Our most fundamental conclusions deal with the relationship between the Department of Energy and the national labs. We find that the trusted relationship that is supposed to exist between the Federal Government and its national labs is broken and it's inhibiting performance. We note that the problems come from both sides, from the labs and the Department of Energy.

We want to be clear that this situation is not uniform across all of the labs. In particular, the labs that are overseen by the Office of Science generally have much better relationships with the Department of Energy than do those in the other program offices.

Many of our recommendations address this fundamental problem. We conclude that the roles need to be clarified and reinforced, going back to the formal role of the labs as federally funded research and development centers for the Department of Energy. Under this model, the two parties are supposed to operate as trusted partners in a special relationship with open communication.

DOE should be directing and overseeing its programs at a policy level, specifying what its programs should achieve, and the labs, for their part, should be responsible for determining how to carry them out and then executing those plans. In doing so, the labs should have more flexibility than they do now to implement those pro-

grams without needing as many approvals from DOE along the way. In return, of course, the labs must operate with transparency and be fully accountable for their actions and results.

This flexibility, in our view, should be expanded significantly in areas such as the ability to manage budgets with fewer approval checkpoints; managing personnel compensation and benefits; entering into collaborations with private companies, including small businesses, without having each agreement individually approved and written into the lab's M&O contract with DOE; building office buildings on sites that are not nuclear, not high hazard, and not classified; conducting site assessments that are relied upon by DOE and others to minimize redundant assessments; and sending key personnel to professional conferences to maintain DOE's work in leading-edge science and for their professional development.

In the Congressional charge to us, we were also asked to examine whether there is too much duplication among the DOE labs. We looked into this in detail and have included two recommendations in this area. The first regards the NNSA laboratories, the nuclear weapons laboratories, where we conclude that it is important to the Nation's nuclear security that the two design laboratories' capabilities continue to be maintained in separate and independent facilities.

The second recommendation in this area regards the way the Department manages through the life cycle of R&D topics. In our view, they do a good job at encouraging multiple lines of inquiry in the early, discovery stages of new subjects, and they're good at using expert panels and strategic reviews to manage mature programs. However, at the in-between stages, the Department needs to assert its strategic oversight role earlier and more forcefully to manage the laboratories as a system in order to achieve the most effective and efficient overall results for the Nation.

We want to acknowledge the progress that currently is being made in some of these and other areas by the current Secretary of Energy and the current Directors of the National Laboratories. We encourage them to continue their efforts, and we encourage the subcommittee and others in Congress to support them and future administrations in this direction.

Let us turn to our recommendations for how we believe Congress can help to improve the performance of the national labs. We would like to cite four here in our opening statement. First, we conclude that the laboratory-directed research and development, LDRD as the Chairman mentioned earlier, is vitally important to the labs' ability to carry out their missions successfully, and we recommend that Congress restore the cap on LDRD funding to the functional level that it was historically up until 2006.

Second, to support strong collaborations between businesses and the national labs, Congress may need to clarify that the annual operating plans that we recommend should provide sufficient authority for the labs to enter into CRADAs and other agreements under the Stevenson-Wyler Act and the fast-track CRADA Program.

Third, we urge Congress to continue to recognize the importance of the role of the national laboratories in building and operating user facilities for use by a wide range of researchers in universities, other federal agencies, and the private sector.

Fourth, there does seem to be a serious shortfall in funding for facilities and infrastructure at the national labs. However, the scope and severity of that shortfall are not well defined. We recommend that the Congress work closely with Department of Energy and with OMB to agree first, upon the size and nature of the problem, and then upon a long-term plan to resolve it, through a combination of additional funding, policy changes, and innovative financing.

In the interest of time, let us finish by highlighting our final recommendation. We found that in the past 4 decades there have been over 50 previous commissions, panels, and studies of the national labs. It is our view that Congress and the administration would be better served by some sort of standing body of experienced people who could provide perspective and advice on issues relating to the national labs without having to create new commissions or studies every time. Such a group could potentially be housed at the National Academies or report to the President's Council of Advisors on Science and Technology or be somewhere else that would provide the independence that Congress requires.

On behalf of our nine commissioners, we want to thank you for this opportunity to serve the country on this important commission. Dr. Cohon and I would also like to acknowledge the great work of our staff at the Science and Technology Policy Institute led by Susannah Howieson and Dr. Mark Taylor who is with us today. We hope that our work will be helpful and are happy to answer questions and to discuss our findings and recommendations. Thank you.

[The prepared statement of Mr. Gauthier and Dr. Cohon follows:]

Summary of Testimony

TJ Glauthier and Jared Cohon, Co-Chairs  
Commission to Review the Effectiveness of  
the National Energy Laboratories

***Securing America's Future: Realizing the  
Potential of the National Energy Laboratories***

November 18, 2015

- Overall finding: the National Laboratory system brings great value to the nation, but is not realizing its full potential
- The trusted relationship that is supposed to exist between the Department of Energy (DOE) and the National Labs is broken
  - This is not uniform across all the Labs
  - Many of the Commission's recommendations address this problem
  - The FFRDC role of the Labs as trusted partners should be reinforced
- The Labs should have more flexibility to carry out DOE's programs, with full transparency and accountability
- The Commission examined whether there is too much duplication
  - In the NNSA, it is important to maintain separate weapons design labs
  - In general, multiple paths of inquiry are important at early stages of new R&D topics, but as programs mature, DOE needs to assert its strategic oversight role earlier to manage the labs more effectively as a system
- Congress can help to improve the Labs performance:
  - Restore the cap on LDRD to its historical functional level
  - If needed, clarify that the annual operating plans will provide authority for the Labs to carry out active CRADA programs
  - Continue to recognize the importance of the role of the National Labs in building and operating user facilities for widespread use
  - Work with DOE and OMB on the shortfall in funding for facilities and infrastructure and on innovative financing
- Finally, Congress should create an independent standing body of senior experts to provide perspective and advice on issues relating to the National Laboratories, in lieu of more new commissions and studies in the future



Testimony

TJ Glauthier and Jared Cohon, Co-Chairs  
Commission to Review the Effectiveness of  
the National Energy Laboratories

Subcommittee on Energy  
Committee on Science, Space and Technology  
U.S. House of Representatives

November 18, 2015

Good afternoon, Chairman Weber, Ranking Member Greyson, other Members and staff of the Subcommittee, and others interested in the National Energy Laboratories. We are pleased to be here to present the final report of the Commission to Review the Effectiveness of the National Energy Laboratories.

Congress created the Commission in the FY2014 Omnibus Appropriations Act. The President's Council of Advisors on Science and Technology developed a list of potential nominees, and the Secretary of Energy selected the nine Commissioners from that list.

The two of us have served as the co-chairs of the Commission for almost 18 months. We were privileged to serve with an outstanding group of Commissioners with strong backgrounds in the science and technology enterprise of the nation. We are pleased that this is a consensus report. We received excellent cooperation and support from the Department of Energy, all the relevant Congressional committees, the White House, the National Laboratories themselves, and many others.

During the course of our work, we visited all 17 of the National Laboratories, heard from 85 witnesses in monthly public hearings in the field and here in Washington, DC, and reviewed over 50 previous reports on this topic from the past four decades.

We have titled our report, ***"Securing America's Future: Realizing the Potential of the National Energy Laboratories."*** Our overall finding is that the national laboratory system is a unique resource that brings great value to the country in the four mission areas of the Department of Energy: nuclear security, basic science R&D, energy technology R&D, and environmental management.

For example, the National Labs have four of the world's fastest supercomputers, which are helping the nation extend the lifetimes and safety of our nuclear

warheads without nuclear testing. In basic science, their world-class particle accelerators, light sources and other user facilities host over 30,000 researchers every year from our universities and industrial partners. And in energy technology R&D, the labs have played an important role in helping to develop the innovations that have led to the nation's shale gas revolution and surge in wind and solar energy.

However, our National Lab system is not realizing its full potential. Our commission believes that can be changed. We provide 36 recommendations that we believe, if adopted, will help the labs to become more efficient and effective and have even greater impact, thereby helping secure America's future in the four mission areas of the Department of Energy.

We'd like to highlight a few of our major findings and recommendations, and then would be happy to address any others of particular interest to you.

Our most fundamental conclusions deal with the relationship between the Department of Energy and the National Labs. We find that the trusted relationship that is supposed to exist between the federal government and its National Labs is broken and is inhibiting performance. We note that the problems come from both sides, the Labs and DOE.

We want to be clear that this situation is not uniform across all of the Labs. In particular, the Labs that are overseen by the Office of Science generally have much better relationships with the DOE than do those in the other program offices.

Many of our recommendations address this fundamental problem. We conclude that the roles need to be clarified and reinforced, going back to the formal role of the labs as Federally Funded Research and Development Centers for the Department of Energy. Under this model, the two parties are supposed to operate as trusted partners in a special relationship with open communication.

DOE should be directing and overseeing its programs at a policy level, specifying "*what*" its programs should achieve. The Labs, for their part, should be responsible for determining "*how*" to carry them out, and then executing those plans. In doing so, the Labs should have more flexibility than they do now to implement those programs, without needing as many approvals from DOE along the way. In return, of course, the Labs must operate with transparency, and be fully accountable for their actions and results.

This flexibility, in our view, should be expanded significantly in areas such as:

- The ability to manage budgets with fewer approval checkpoints,
- Managing personnel compensation and benefits,

- Entering into collaborations with private companies, including small businesses, without having each agreement individually approved and written into the lab's M&O contract with DOE,
- Building office buildings on sites that are not nuclear, not high hazard, and not classified,
- Conducting site assessments that are relied upon by DOE and others to minimize redundant assessments, and
- Sending key personnel to professional conferences to maintain DOE's work in leading edge science and for their professional development.

In the Congressional charge to us, we were asked to examine whether there is too much duplication among the National Labs. We looked into this in detail, and have included two recommendations in this area. The first regards the NNSA laboratories, where we conclude that it is important to the nation's nuclear security that the two design laboratories' capabilities continue to be maintained in separate and independent facilities.

The second recommendation in this area regards the way the Department manages through the life cycle of R&D topics. In our view, they do a good job at encouraging multiple lines of inquiry in the early, discovery stages of new subjects. And they are good at using expert panels and strategic reviews to manage mature programs. However, at the in-between stages, the Department needs to assert its strategic oversight role earlier and more forcefully to manage the laboratories as a system in order to achieve the most effective and efficient overall results.

We want to acknowledge the progress currently being made in some of these and other areas by the current Secretary of Energy and the current Directors of the National Laboratories. We encourage them to continue their efforts, and we encourage your Subcommittee and others in Congress to support them and future Administrations in this direction.

Let us turn to our recommendations for how we believe Congress can help to improve the performance of the National Labs. We would like to cite four here in our opening statement:

- First, we conclude that Laboratory-Directed Research and Development, LDRD, is vitally important to the labs' ability to carry out their missions successfully, and we recommend that Congress restore the cap on LDRD funding to the functional level that it was historically, up until 2006.
- Second, to support strong collaborations between businesses and the National Labs, Congress may need to clarify that the annual operating plans that we recommend should provide sufficient authority for the Labs to enter into CRADAs and other agreements under the Stevenson-Wyler Act and the fast-track CRADA Program.

- Third, we urge Congress to continue to recognize the importance of the role of the National Laboratories in building and operating user facilities for use by a wide range of researchers in universities, other Federal agencies, and the private sector.
- Fourth, there does seem to be a serious shortfall in funding for facilities and infrastructure at the National Labs. However, the scope and severity of that shortfall are not well defined. We recommend that the Congress work closely with DOE and OMB to agree, first, upon the size and nature of this problem, and then, upon a long-term plan to resolve it, through a combination of additional funding, policy changes, and innovative financing.

In the interest of time, let us finish by highlighting our final recommendation. We found that in the past four decades there have been over 50 previous commissions, panels, and studies on the National Labs. It is our view that Congress and the Administration would be better served by some sort of standing body of experienced people who could provide perspective and advice on issues relating to the National Laboratories, without having to create new commissions or studies every time. Such a group could potentially be housed at the National Academies, or report to the President's Council of Advisors on Science and Technology (PCAST), or be somewhere else that would provide the independence that Congress requires.

On behalf of our nine commissioners, we want to thank you for this opportunity to serve the country on this important commission. We hope our work will be helpful and we are happy to answer questions and to discuss our findings and recommendations.

## **Commission to Review the Effectiveness of the National Energy Laboratories**

### **Biography**

#### **Jared L. Cohon, Co-Chair**

Dr. Jared L. Cohon is President Emeritus and University Professor of Civil and Environmental Engineering and Engineering and Public Policy at Carnegie Mellon University.

Dr. Cohon served as president of Carnegie Mellon for 16 years (1997–2013). He came to Carnegie Mellon from Yale, where he was Dean of the School of Forestry and Environmental Studies from 1992 to 1997. He started his teaching and research career in 1973 at Johns Hopkins, where he was a faculty member in the Department of Geography and Environmental Engineering for 19 years. He also served as Assistant and Associate Dean of Engineering and Vice Provost for Research at Johns Hopkins. Dr. Cohon earned a B.S. degree in civil engineering from the University of Pennsylvania in 1969 and a Ph.D. in civil engineering from the Massachusetts Institute of Technology in 1973.

An author, coauthor, or editor of one book and more than 80 professional publications, Dr. Cohon is an authority on environmental and water resource systems analysis, an interdisciplinary field that combines engineering, economics and applied mathematics. He has worked on water resource problems in the United States, South America and Asia and on energy facility siting, including nuclear waste shipping and storage. In addition to his academic experience, he served in 1977 and 1978 as legislative assistant for energy and the environment to the late Honorable Daniel Patrick Moynihan, United States Senator from New York. President Bill Clinton appointed Dr. Cohon to the Nuclear Waste Technical Review Board in 1995 and appointed him as chairman in 1997. His term on the Board ended in 2002. President George W. Bush appointed Dr. Cohon in 2002 to the Homeland Security Advisory Council and President Barack Obama reappointed him in 2009. His term on the Council ended in 2013.

In 2009, Dr. Cohon was named a Distinguished Member of the American Society of Civil Engineers. He was elected to the National Academy of Engineering and to the American Academy of Arts and Sciences in 2012. He has received honorary degrees from the Korean Advanced Institute for Science and Technology, the University of Pittsburgh and Carnegie Mellon.

## **Commission to Review the Effectiveness of the National Energy Laboratories**

### **Biography**

#### **TJ Glauthier, Co-Chair**

TJ Glauthier, President of TJG Energy Associates, LLC, is an advisor to energy companies and public agencies. He held two Presidential appointments in the Clinton Administration: at the White House as Associate Director of the Office of Management and Budget from 1993–1998, and as the Deputy Secretary and COO of the Department of Energy from 1999–2001. He also served on President Obama’s transition team in 2008.

Mr. Glauthier was a member of the Congressional Advisory Panel on the Governance of the Nuclear Security Enterprise in 2013–2014.

He currently serves on two corporate boards of directors: EnerNOC, a provider of energy intelligence software, and VIA Motors, a manufacturer of electric drive pickup trucks and vans. He is an advisor to Booz Allen Hamilton’s energy practice and has also served on advisory boards for numerous energy technology companies.

In addition, he is a member of the National Research Council’s Policy and Global Affairs Committee, the Precourt Institute at Stanford University, and the Lawrence Berkeley National Laboratory Advisory Board.

Earlier, Mr. Glauthier was CEO of the Electricity Innovation Institute, an affiliate of EPRI, and spent twenty years in management consulting. He is a graduate of Claremont McKenna College and the Harvard Business School.

Chairman WEBER. Thank you, Mr. Glauthier. I now recognize Dr. Littlewood for five minutes.

**TESTIMONY OF DR. PETER LITTLEWOOD,  
DIRECTOR, ARGONNE NATIONAL LABORATORY**

Dr. LITTLEWOOD. Thank you very much. Chairman Weber, Ranking Member Grayson, Members of the Committee, my own Congressman Lipinski, thank you for the opportunity to share my thoughts about the findings and recommendations of the Commission.

Let me start by acknowledging the Commission for performing a thorough analysis. Commission members are really to be commended for the time and effort they spent on examining all 17 national laboratories' missions, capabilities, operations, and challenges. It was a very thorough investigation, and we're grateful for that.

My fellow lab directors and I are pleased with the Commission's assessment that the laboratories provide great benefit to the country, that we serve not only the DOE mission but also support the broader science and technology community and help fulfill the security needs of the Nation.

At the Secretary of Energy's request, we are collectively preparing a detailed response for his eyes, and we have actually already submitted that to him in the last day or two and I'm sure he will want to share that with you in due time. But following many discussions that the lab directors and I have had together, I believe that my colleagues broadly endorse the major recommendations of the report. We commit to wholeheartedly engage on our part to work with DOE to make the necessary changes to further increase the value of the national laboratories.

In the testimony that follows, I will give you mostly my perspective as Argonne Director, but as I say, I think I broadly represent the views of my fellow lab directors.

The recommendations made by the Commission demonstrate certainly that they heard our feedback and ideas. We are gratified in particular by what I see as a prevailing theme on which I would like to focus my remarks today, the theme of reintroducing acceptable risk-taking into the lab enterprise, a theme which was already touched on by the Chairman in his opening remarks.

Risk can seem like a negative word, and I would agree that risk is negative in the realm of safety, but frankly, safety is the only area in which I would agree we should never take a risk.

What has developed within the DOE and its laboratories over time and in response to various events is increasing attention to detail and attempts to reduce uncertainty. This approach isn't unexpected and not necessarily all bad, wishing to manage risk in a multibillion-dollar institution like DOE is of course reasonable. But we've reached a point where we punish failure rather than rewarding success, and we're concerned that we've traded innovation for regulation.

So reinvigorating the government-owned, contractor-operated, or GOCO, model as recommended by the Commission essentially helps us hit the reset button. When DOE gives the laboratories and their contractors the authority to operate with more discretion, we

are empowered to take the kind of risks that are imperative for scientific discovery and for technological innovation. In return, we accept the need for transparency and accountability.

So to chart new frontiers, laboratories must take risks in breaking down barriers. We must work across scientific disciplines, between fundamental and applied science, between research institutions, and between funding agencies. This means overlap, sometimes messy.

A fear of supporting what might be presented as duplicative research by different agencies or in different institutions is now resulting in challenges in building the pipeline from fundamental research to product. The large user facilities of the labs support communities of researchers who lie well outside DOE's own mission space, but just in medicine that intersection has supported in the past such important advances as proton radiotherapy, many major drug developments, the human genome initiative, and the artificial retina.

And just as surely as we must risk failing, we must risk succeeding and being able to handle the new challenges prompted by that success. Success in science and technology inevitably leads to positive but sometimes disruptive change.

Perhaps no other endeavor we undertake at our labs better exemplifies the need for accepting risk than the LDRD Program. We welcome the Commission's recommendation to restore the cap on LDRD to six percent unburdened or equivalent.

Investment in LDRD has enabled virtually every major Argonne initiative including the original Advanced Photon Source and its upgrade, the Leadership Computing, the Joint Center for Energy Storage Research, four Energy Frontier Research Centers, advanced nuclear fuel cycle and reactor modeling/simulation processings. LDRD is peer-reviewed and extraordinarily competitive.

So to conclude, I want to reiterate that I largely support the Commission's report, as it speaks to the ideas and feedback that we have shared. The recommendations, when implemented, will help create a working atmosphere to which the labs and I believe DOE as well aspire, an environment where we are empowered to take risks leading to new scientific discoveries in support of critical mission areas for the Nation.

[The prepared statement of Dr. Littlewood follows:]



**Testimony of Dr. Peter Littlewood  
Director, Argonne National Laboratory  
before the  
Energy Subcommittee of the House Committee on Science, Space and Technology  
November 18, 2015**

Chairman Weber, Ranking Member Grayson, and members of the Subcommittee, thank you for the opportunity to share with you my thoughts on the findings and recommendations of the Commission to Review the Effectiveness of the National Energy Laboratories.

Let me start by acknowledging the Commission for performing a thorough analysis. Commission members are to be commended for the time and effort they dedicated to examining all 17 national laboratories' missions, capabilities, operations, and challenges.

My fellow lab directors and I are pleased with the Commission's assessment that the laboratories provide great benefit to the country, and that we serve not only the DOE mission but also support the broader science and technology community and help fulfill the security needs of the nation. At the Secretary of Energy's request, we are collectively preparing a detailed response, and we expect to share that in due time. Following much discussion, I believe that my colleagues broadly endorse the major recommendations of the Report. We commit to wholeheartedly engage on our part to work with DOE to make the changes necessary to further increase the value of the national laboratories.

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Reinvigorating the government-owned, contractor-operated, or GOCO, model, as recommended by the Commission, essentially helps us hit the reset button. When DOE gives the laboratories and their contractors the authority to operate with more discretion, we are empowered to take the kind of risks that are imperative for scientific discovery and technological innovation. In return, we accept the need for transparency and accountability.

To chart new frontiers, laboratories must take risks in breaking down barriers. We must work across scientific disciplines, between applied and fundamental science, between research institutions, and between funding agencies. This means overlap – sometimes messy. A fear of supporting what might be presented as duplicative research by different agencies, or in different institutions, is now resulting in challenges in building the pipeline from fundamental research to product. The large user facilities of the labs support communities of researchers who lie well outside DOE's own mission space, but just in medicine that intersection has supported in the past such important advances as proton radiotherapy, many major drug developments, the human genome initiative, and the artificial retina.

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To conclude, I want to reiterate that I largely support the Commission's report, as it speaks to the ideas and feedback that we shared. The recommendations, when implemented, will help create a working atmosphere to which not only the laboratories, but I believe DOE as well, aspire: an environment where we are empowered to take risks leading to new scientific discoveries in support of critical mission areas for the nation.

## Peter B Littlewood

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### Positions held

2014-: Director, Argonne National Laboratory  
2011- : Associate Laboratory Director, Physical Sciences & Engineering, Argonne National Lab  
2011- : Professor of Physics, James Franck Institute, University of Chicago  
1997-2011: Professor of Physics, Cambridge [2005-2011, Head of Department of Physics]  
1992-1997: Head, Theoretical Physics Research, Bell Laboratories  
1980-1997 and 1997-2001 (part-time) Member of Technical Staff, Bell Laboratories

### Education

1977-1980, PhD in Physics, Cavendish Laboratory, University of Cambridge  
1976-1977, Department of Physics, Massachusetts Institute of Technology  
1973-1976, BA (1<sup>st</sup> class) in Natural Sciences (Physics), University of Cambridge

### Other appointments

Associate Member, TWAS 2010  
Fellow, Royal Society of London, 2007  
Fellow, Institute of Physics, 2005  
Matthias Scholar, Los Alamos National Laboratory, 2003-2004  
Consultant, Los Alamos National Laboratory, 2004-  
Consultant, National High Magnetic Field Laboratory, 2004-  
Fellow, Trinity College Cambridge, 1997  
Fellow, American Physical Society, 1989  
Distinguished Member of Technical Staff, AT&T Bell Laboratories, 1989  
Professeur Associé and Visiting Scientist, CNRS, Grenoble, 1986  
Denman Baynes Student, Clare College, Cambridge 1979-80  
Kennedy Scholar, Massachusetts Institute of Technology, 1976-77  
Senior Scholar, Trinity College Cambridge, 1974-76

### Scientific research

More than 200 articles in scientific journals and 6 patents, cited ~10000 times, h-index 50 (Web of Science).  
**Superconductivity.** Collective modes. Phenomenology of high-temperature superconductivity. BEC-BCS crossover in fermionic ultra-cold atoms.  
**Materials.** Microscopic theory of the ferroelectric phase transition in IV-VI compounds. Ordering in semiconductor alloys.  
**Non-linear dynamics.** Theory of sliding charge density waves: screened dynamics, mode-locking, dynamic and self-organised critical behaviour.  
**Semiconductor optics.** Theory of collective phenomena of excitons and polaritons.  
**Magnetic materials.** Theory of colossal magnetoresistance and multiphase coexistence in manganites and other transition metal oxides. Theory of the resistance of disordered and magnetic semiconductors.  
**Applied science.** Algorithms for holographic storage. Theory of optical fiber capacity. Semiconducting magnetic sensors. Acousto-optic switch. Modelling of ferroelectric devices. New materials for particle detectors. Materials for energy.

Chairman WEBER. Thank you, Dr. Littlewood. The Chair now recognizes himself for five minutes for questioning. I guess this is to Mr. Glauthier and Dr. Cohon. My first question is for both of the co-chairs. Would you all for us please identify the most recognizable inefficiencies between the DOE and its Science and Energy Labs? And when you do that, please explain to us how they affect, how these issues affect research on a daily basis? Mr. Glauthier.

Mr. GLAUTHIER. Sure. Thank you, Mr. Chairman. I think the inefficiencies that we noticed the most are the transactional oversight, the amount of approvals required, the amount of investigations and inspections and the like and that there's a lot of time spent on both sides, both at the Department and in the laboratories on these processes that is detracting from the time spent on the research mission that the laboratories carry out.

Chairman WEBER. Dr. Cohon?

Dr. COHON. Thank you, Mr. Chairman. I would add just for emphasis something that Mr. Glauthier mentioned in our testimony and that's this issue of duplication. As he explained, duplication is desirable early on as a new field of science is emerging. Having multiple laboratories trying out different approaches is a good thing. But there comes a point where the science becomes clearer and a particular approach seems like the—emerges as the preferred one. We need, we all need DOE to assert itself more forcefully at that moment so we don't waste time and money on multiple approaches.

So what we've urged in our recommendation is that DOE look for that opportunity and intervene more forcefully in that process.

Chairman WEBER. Dr. Littlewood, I'm going to come to you, but before I do, I want to go back to Mr. Glauthier. You said in your opening statement I think you had studied 50 reports? Was that right?

Mr. GLAUTHIER. Yes, that's right. We think we're report number 56.

Chairman WEBER. Number 56? Okay. And so have you seen a trend through that timeframe of the detail, getting bogged down into more and more of exactly what you're talking about?

Mr. GLAUTHIER. Yes, I think for the last 20 years going back to the Galvin Commission in the mid-'90s, that these recommendations have been very similar, and there's been a lot of concern about the transactional oversight or the amount of micromanagement that's gone on.

Chairman WEBER. Dr. Cohon, did you wish to weigh in on that?

Dr. COHON. No, sir.

Chairman WEBER. Smart man. Dr. Littlewood, I'm going to come to you. How do you think these suggestions apply to your laboratory?

Dr. LITTLEWOOD. Well, let me make a brief comment about transactional oversight. Of course, we're not opposed to oversight. Oversight is important. We must demonstrate that we're using the taxpayer money well. But just a small comment. In 2014 we had four significant findings from audits. All of those were found by internal audits. We had 12 internal audits, 50 assessments and audits that came from outside.

So we spend a lot of time on trying to make sure that we do a good job ourselves. And I will say that the attempt to bring in the contractor assurance system which has come in the past few years and was commented on in the report I think is a very good idea. I will say that there seems to be resistance within the system to bringing that to the stage that it was needed.

So that's one comment. And then to comment about the competitive nature of science, I again agree, and I think there is some movement in the right direction. So firstly, science is a competitive discipline. That's one reason that the United States is so good at it. And so the fact that we use competition in the early stages to drive discovery is necessary. And then I think the ability to bring that together at the point where a program can be constructed and driven is something that has emerged strongly as a focus of the current Secretary in the past few years through ideas such as the Big Idea Summits, working together in cross-lab groupings, and it's something that the lab directors support. I think that wasn't a characteristic of activities 5 or ten years ago.

Chairman WEBER. You said in your comments, Dr. Littlewood, that you look forward to the theme of reintroducing acceptable risk-taking into the lab enterprise. I think that's what you said.

Dr. LITTLEWOOD. Yes.

Chairman WEBER. I'm reading from them.

Dr. LITTLEWOOD. Yes, that's correct.

Chairman WEBER. Okay. Would you elaborate on that? And then how do you define success based on what kind of, quote, failure and risk-taking? I'll leave that to you.

Dr. LITTLEWOOD. Right. So I think that—well, sometimes actually you must risk success. So we're often concerned about doing things in slightly uncharted areas because the result of success would be a project that was successful perhaps slightly outside the DOE mission space. We're very conscious, however, of not doing things that could produce failure. Scientific failure is something that one should expect occasionally as a function exercise. When you fail, you know that you should stop doing that and find ways of doing something else.

I'm concerned that we actually have too many programs which can neither succeed, nor can they fail, and therefore they tend to stagnate.

Chairman WEBER. Okay. Thank you. I'm reminded about Thomas Edison's quest to invent the light bulb on his thousandth try, and his staffer said doesn't that just frustrate you? It's a thousand failed attempts. He said what are you talking about? We now know a thousand ways it won't work. We're closer than ever.

So the Chair now recognizes Mr. Grayson.

Mr. GRAYSON. Thank you. I'd like to conduct a brief high-level, somewhat abstract discussion that is untethered from any specific recommendations that you made.

Why do we have national labs instead of competitive grants open to everyone? Mr. Glauthier?

Mr. GLAUTHIER. I'm sorry, Mr. Grayson. I didn't quite understand the question.

Mr. GRAYSON. Why do we have a national lab system instead of taking the same amount of money and dispersing it through DOE

to competitive grants open to everybody, presumably the best offer—or? Why do we do it the way we do it?

Mr. GLAUTHIER. Well, I think what we've tried to recognize is there's a role for the national laboratories in this system of research enterprise for the country that is important and that you can have a lot of very successful research done in the university community, for example, by individual investigators, principal investigators, who compete for grants of the type you've mentioned. At some stage you need to have large-scale programs that are complex interdisciplinary and that extend over longer periods of time. And those in particular are places where the national laboratories can house those projects. There's still a degree of competition among the funding programs at the Department and elsewhere.

One of the things we recommend in our report is there should be much better use of peer-review groups so that as programs exist and are funded over time, there are—the experts in the field are brought together from time to time from the university community, industry, and the other labs to review the work and to make sure that it is the appropriate work that the Federal Government should be supporting and that it should be done there at the labs as opposed to done in the nature of grants that would be funded elsewhere.

Mr. GRAYSON. Dr. Cohon, go ahead.

Dr. COHON. Yeah, please. I'd like to add to what TJ has said. For me—well, let's take the weapons labs and put them aside because they clearly have a reason for being which is unique. But to the way you put your question which I like very much, I have a very large number of colleagues who would say, yes, that's exactly the right question. All the money should come to us and not to the labs.

I think that the reason for being in the first instance, the non-weapons labs, are the user facilities. These truly are unique. They could not be mounted or maintained by any single university that I know of. Universities collaborate together but not that well and not that effectively, which they surely would have to do to maintain these facilities. So for me that's the foundation.

Having created those facilities and maintaining them, that naturally first of all requires scientists and technical people to maintain them but also attracts to them world-class scientists to use them and to support them.

So I think that's the most compelling answer to your question. But I don't want in any way want to take away from what Mr. Glauthier said. I think he's absolutely right. If you look at the continuum of R&D from basic research to the marketplace, the labs do occupy a niche somewhere between universities and companies. They are able to do these large long-term collaborative projects that Mr. Glauthier mentioned.

Mr. GRAYSON. Dr. Littlewood?

Dr. LITTLEWOOD. Thank you. Yeah, I of course do agree with everything we've heard, so I don't want to expand on those. But I'll add one further thing where I think the labs could play a big role and that's actually by bringing together consortia that often involve universities and industry to work on large, long-term problems that are necessary to do that. You know, as an example, just a local one

for Argonne, we run the Joint Center for Energy Storage Research which is a \$25 million a year program with DOE that involves a collaboration between five labs, four major universities sort of as partners for companies and many other academics. It would be very difficult to bring that kind of collaboration together from the vantage of being a university academic. And I can tell you that because I've been one and tried to do that kind of thing, and it isn't so easy from that side.

So I think that's another key role I suspect for the labs.

Mr. GRAYSON. Mr. Glauthier, briefly, since I'm almost out of time here, why have contractor-operated facilities instead of government-operated facilities directly managed by DOE?

Mr. GLAUTHIER. The contractor-operated facilities, which are the majority, 16 of the 17, have a very good record of having been able to attract and retain top-quality scientists and to be able to manage that effectively.

Certainly there are government laboratories at not only DOE but elsewhere. Our sense is that the quality of the science has been better at these run by M&O contractors, consistently better. There's good research at the other labs but not as consistently high quality.

Mr. GRAYSON. Thanks. I yield back.

Chairman WEBER. Dr. Littlewood, if I understood your response to his question about the research being done at the labs to the universities, did you say that the universities can learn something from you all but you all have never really learned anything from the universities?

Dr. LITTLEWOOD. I don't think—

Chairman WEBER. I'm just—

Dr. LITTLEWOOD. —I'd quite put it that way.

Chairman WEBER. Okay. I was just double-checking. The Chair now recognizes the two young gentlemen from Illinois. Would you like to—would the gentleman from Illinois like to introduce them?

Mr. HULTGREN. Glad to have some very important staff with me today, my son, Kaden, and my son, Kole. So I'm glad they're joining me in Washington, D.C.

Chairman WEBER. Welcome, gentlemen.

Mr. HULTGREN. Thank you. Thanks, Chairman. Thank you, gentlemen, for being here. I really do appreciate your work so much, and Director Littlewood, I especially want to say good to see you, always good to see you. And certainly I love to tell the story of what great things are happening in Illinois with our great laboratories, Argonne and Fermi and research university. So thank you.

Dr. Cohon and Mr. Glauthier, we'd also like to thank you for all your work your Commission did after the cromnibus. I know you've both been very available to my staff with the National Laboratories Caucus as well in both the House and the Senate. I certainly share your goal of finally implementing some of the changes which we seem to be rehashing every few years.

A little over two years ago, this subcommittee held a hearing looking at the ITAF study on the labs done by Heritage and the Center for American Progress, certainly very bipartisan groups. Last year, Brookings put together a good study looking at ways to

better utilize the labs' tech transfer capabilities to spur local and regional economic development.

So I see your concern and agree with it about the number of studies which have been showing many of the same things over and over again. I also want to see that some of these things finally get acted upon.

In the last two Congresses the House has passed my legislation to free up the labs to do the work without unnecessary burdensome oversight. Some of the most important provisions in my bill freed up the ability of the labs to be able to enter into ACT agreements, gave signature authority for tech transfer agreements under \$1 million to lab directors, and allowed for some early stage proof-of-concept work to be done with tech transfer funds.

In the Statement of Administration Policy on this year's COMPETES' reauthorization, the President's Senior Advisor characterized these sections as reducing oversight in a way that would increase the exposure of the federal government to risk and liability while also conflicting with the execution of the DOE mission.

Dr. Cohon and Mr. Glauthier, I wondered, this seems to me to be the lack of trust you mentioned throughout your report. I wonder if you could explain to the Committee how the M&O contracts do and perhaps should work? It also seems to me that a lab would be hesitant to stray from the DOE mission risking the loss of their contract which comes under review every few years.

Mr. GLAUTHIER. Yes, Congressman, happy to respond to this. And we think that your legislation actually is directed in the right way, the principal elements of it, to make it easier for partnerships between the laboratories and the private sector or others, and our recommendations are very consistent with that.

I think the key element is that it's not just letting the labs free to go off and do all those things. But our recommendation is that there ought to be an annual operating plan at the beginning of each year where the government and the laboratory agree on the scope and scale of the things that laboratory's going to do for the coming year. And that would include the amount of cooperative work that they tend to do with industry, and they're going to describe the nature of that work.

Let's say a laboratory like Argonne is going to do \$50 million worth of cooperative work with various industries, a lot of it consistent with what they've done in previous years. And once they've had that discussion and they've agreed with the government about that, then the laboratory ought to be free to carry it out. And as long as the agreements with companies would be consistent with that plan and within that scope, they ought to be able to go ahead and do it exactly as you described in your legislation.

But there doesn't seem to be that predicate, that description, discussion up front, an understanding of what the areas are in which the laboratories are going to do this sort of work. But the key is the laboratories should be responsible. It does have to be transparent as it goes forward. It has to report what it's doing. It has to share that information with the Department and be accountable for the way it's done.

Mr. HULTGREN. Dr. Cohon or Director Littlewood, do you have any thoughts on that?



Dr. COHON. I would only add to echo what we say in our report that the DOE should be identifying what needs to be done in collaboration with the laboratories and then leave it to the labs to figure out how to do it, which is again, very consistent with your legislation.

Mr. HULTGREN. Thanks. Dr. Littlewood?

Dr. LITTLEWOOD. Yeah. I mean, let me actually broadly say that from Argonne's perspective, our interactions with the Office of Science are quite positive often in many regards associated with this. But I think I'd like very much to build on the number of challenges you address, somehow getting rid of the sand and grit out of the works, in particular, being able to deal with industry. Sometimes we find it easier to deal with big companies because they have about the same number of lawyers as we do. When we want to be fast and nimble and help small companies take things to market, you know, we need more rapid methods of doing this. And I think many of the labs are looking for experiments to do this. They're being supportive through DOE by for example the invention of the Office of Tech Transfer. But I think that they can be further engaged by the kind of legislation you're pushing.

Mr. HULTGREN. Thanks. Five minutes goes by way too fast. I have a couple other questions. If it would be all right if we could follow up in writing with you all, that would be great. But with that, Chairman, I yield back the balance of my time I don't have.

Chairman WEBER. I thank the gentleman from Illinois. I recognize the other gentleman from Illinois, Mr. Lipinski.

Mr. LIPINSKI. Thank you, Mr. Chairman. My first question is for Director Littlewood. As you know, I'm very interested in ways that can help the national labs bring new energy technologies to market faster, in general, the whole idea of improving technology transfer. I was pleased to see the recommendation 25 in the Commission's report mentioned the need to continue to look for ways to improve the technology transfer process.

I know that Argonne puts a lot of emphasis on the commercialization portion of their mission. So I want to ask, does Argonne have challenges in taking technologies to market that we might be able to alleviate or lessen with Congressional action? Are there any recommendations you would make to us?

Dr. LITTLEWOOD. Thank you very much, Congressman. As you remarked, it's really an important part of that business to try and take technologies to market.

What I'd like to see in fact is an expansion of what I would call the user facility concept in this space. So we're used at Argonne to having 5,000 users who come from all to use our advanced photon source, but we also have large and embedded facilities of the labs that can be really important in taking technology to market, and we'd like to find ways of making them more accessible.

So sometimes those facilities have been funded by DOE. Sometimes they've been funded by different pieces of DOE, and we found for example that we've kind of got an unwieldy internal portfolio of activities and sometimes difficulty bringing those together in kind of one-stop shopping for any customer who is interested in our business. And DOE is helpful about this, but sometimes DOE looks over its own shoulder at duplication.

So I'll give you one small example. We have a project that I'm very proud of which is to develop better combustion chemistry for engines, and it goes all of the way from fundamental chemistry all the way up to design of engines. That program is funded by four different pieces of DOE. Because of concern about duplicative research and duplicative oversight, those pieces of DOE look at the boundary between the areas they're funding and are very concerned about overlaps. If you want to go from tech transfer, you want to take something from fundamental science all the way through to the market, you must engage in overlaps.

So I think Congress could help by putting in language which is more sophisticated about duplicative research, overlaps that would in fact encourage overlaps and enable things to get to market more quickly.

Mr. LIPINSKI. Thank you. I wanted to use the rest of my time to move onto sort of reiterating and getting more from all of you about the duplication of research issue that Mr. Glauthier had mentioned. I know that the report also states that most duplication that occurs within the R&D programs of the labs is intentional, managed, and beneficial to the Nation. And I want to make sure that everyone here understands that this is not government waste that we're talking about here.

Can you explain a little better, Mr. Glauthier, Dr. Cohon, why well-coordinated independent replication of research activities is valuable to the scientific process in national labs? And if there's anything that Dr. Littlewood would want to throw in there—I just wanted to make sure that we all understand what this is really about.

Mr. GLAUTHIER. Sure. Let me start, Congressman. The duplication if you will at the NNSA labs, the weapons labs, is quite different than that of the others. So let me start with those. And there we did state very clearly that the duplication or the fact that we have design capabilities of nuclear weapons programs for the country—you have two different labs—is very important to the country. We have seen the benefits of the two different groups of weapons designers being able to validate their designs or to be able to test those against each other. And that's a specialized case where it's a very important one for us.

The other types of duplication if you will are really a misnomer. For the most part, the work that's being done is very similar but it's different. The accelerators is one of the examples, light sources or other forms of accelerators that the government has funded and operates at different science laboratories around the country. Each one is a light source all right, but they're different. There are different degrees of X-rays, different speeds and hardness, different kinds of applications. And so researchers end up using those for different types of research. And our group was quite satisfied as we went through this that the processes that the Office of Science uses in this case to bring together experts to really examine that and be sure as they go over the process of building new facilities or maintaining these is one that is serving the right needs of the country and not duplicating science.

Mr. LIPINSKI. Dr. Cohon?

Dr. COHON. I'd like to support and join the comments that Dr. Littlewood made before about the nature of science and its competitive nature. He's absolutely right about that. One of the major reasons that the United States is such a leader in research is because of the competitive nature of our research enterprise. So allowing for and managing that competition among the laboratories is actually a very good thing for the Nation. And the key is the management part of it and understanding at what point the competition should end and we should move on.

And I also want to agree with Dr. Littlewood's comment before that this administration of the Department has done quite well in this regard, and there's been very good progress. So it's not a waste. In fact, it's a very key attribute of the national lab system.

Mr. LIPINSKI. Thank you. Thank you, Mr. Chairman, for letting us go a little bit further. But I think that was a good explanation we needed to hear. Thank you. Yield back.

Chairman WEBER. Well, I'm going to take you a little further if the gentleman would—little help over here. Dr. Littlewood, you had six patents, is that correct?

Dr. LITTLEWOOD. Uh-huh.

Chairman WEBER. Okay. And so when you went through that process of—I guess that was research and development of something. You would say that there's steps, identifiable steps, one, two, three, four, I don't know. Maybe not like Edison with over a thousand but a certain number of steps. And I think what I hear you all saying is if you've got two processes going on at the same time, maybe somebody does a better step three than your process has. And so in that regard, the taxpayers come out because we actually get the best bang for our buck. The entire process becomes better. Does that make sense?

Dr. LITTLEWOOD. I agree entirely. That's very well put. So the process of scientific invention and tech to market is many things.

Chairman WEBER. Sure.

Dr. LITTLEWOOD. Lots have to be joined up.

Chairman WEBER. All right.

Dr. LITTLEWOOD. And there you have it exactly right. They must—

Chairman WEBER. I appreciate it, and thank you all for your indulgence. I recognize the gentleman from Georgia.

Mr. LOUDERMILK. Thank you, Mr. Chairman. This is a very interesting topic, especially to me. The Chairman took—we took a CODEL not too long ago to the Savannah River Lab which my father actually worked at right after World War II. The first time I had visited there. But I'm also on the Homeland Security Committee. So the research and development and everything that goes on within the Department of Energy for our national security is of exceptional interest. But what really interested me is we share a lot in common after reading recommendation number two. We all agree that overregulation is not healthy for competition and for development, for innovation. And I think you identified that having a trusting relationship that is free from expensive, burdensome administrative oversight from DOE would be very helpful. And I appreciate that.

Obviously oversight of sensitive national security research is very important. We need to have a level of oversight. We need to make sure that we control what we're doing, that the intellectual properties, that it stays within the defense community.

But the domestic, non-defense related research and development, I think we agree—maybe we can reduce the regulatory burden on these. So Mr. Glauthier, and I'd also like to hear from Mr. Cohon as well. When considering legislative improvements for the national labs and the amount of DOE oversight, should Congress make a clear distinction between national security and domestic research?

Mr. GLAUTHIER. That's a very interesting question. I think both of them need the effective oversight that makes sure that the work is being done in a way that's consistent with the policies of the Nation. Frankly, we found that the planning and oversight processes in the weapons program were not as effective, are not as effective, as those in the Office of Science programs for example. And we recommended that some of the procedures being used in the Office of Science ought to be adapted and used in the other areas as well.

The peer review processes in particular, sometimes the weapons programs I think use the excuse that their — that the classified activities restrict the number of people who can participate in peer reviewed and the like. But our feeling is that there are ways to make those peer review processes more effective and use the discipline that comes from that to make the whole program more successful, more effective, and to manage projects in a way that brings them in on schedule, on budget and the like at the performance levels of her plan.

Mr. LOUDERMILK. Dr. Cohon?

Dr. COHON. I have nothing to add to that.

Mr. LOUDERMILK. Okay.

Dr. COHON. Thank you, Mr. Loudermilk.

Mr. LOUDERMILK. One last question on this for you two—what can Congress do to facilitate this, reduce the red tape?

Mr. GLAUTHIER. That's a great question. The Department of Energy actually has the authority to do most of the things that we recommend if they are willing to do it. So one of the aspects is that the Congress can be supportive, can indicate to the Department that you really want them to restore this kind of working relationship. Another key element I think goes back to what Dr. Littlewood talked about which is risk acceptance. A lot of the rules that the Department have been put in place because something went wrong, and people put a new rule in place and said, well, we're never going to have that problem again. Okay, but you've got a lot of other problems. Over time it becomes a very cumbersome working environment.

I think we have to recognize that things will go wrong. If you have 55,000 people working at the national labs, there will be some mistakes. We have to make sure we manage the risk side so that really serious mistakes don't happen but that smaller errors can. An example is property management. We've got rules for tracking laptop computers that mean they have to inventory those and find every one of those at every lab every year. And there's a point of diminishing returns. Some of those laptop computers are so old

they're not worth tracking down. You ought to decide that at some point you draw the line and say, okay, we've gotten 98 percent of them. There are just rules of that sort. I think Congress can be supportive of a risk acceptance, a risk management approach to the way the Department is run.

Mr. LOUDERMILK. Okay. Dr. Littlewood, would you like to add anything?

Dr. LITTLEWOOD. I think I'd just echo that. I think we don't have a risk-based management approach of the labs, and that's something that we would really benefit from.

Chairman WEBER. The gentleman yields back. The gentleman from California is recognized, Mr. Swalwell.

Mr. SWALWELL. Thank you, Chair. Thank you for those who participated in the study, and also I want to thank Mr. Littlewood for coming here and representing a national laboratory as well. I am proud to represent Lawrence Livermore National Laboratory as well as Sandia National Laboratory, approximately 8,000 lab employees in our district. A good chunk of them are scientists. And so when we think about the lab community, 17 different laboratories, 55,000 people, Dr. Littlewood, could you just very briefly describe to me approximately how many of them are scientists, people with advanced degrees or even a bachelor of science degree or beyond?

Dr. LITTLEWOOD. I'm not sure I could say that for all of the labs but I think probably reflecting your labs, too. I mean, at Argonne, we have 3,500 employees, 1,500 of them have advanced degrees. I think that's probably a common proportion across the labs. And many of those of course who don't have advanced degrees will have bachelor's degrees and working this.

Mr. SWALWELL. And Dr. Littlewood, to get an advanced degree today or even 10 or 15 years ago, you agree it's quite an investment in one's future?

Dr. LITTLEWOOD. Yeah, I agree.

Mr. SWALWELL. And one challenge that I have come across talking to our lab employees at home is that because the labs are operated as government-owned, contractor-operated, these scientists who have made six-digit investments in their future with the student loan debt that they've taken on do not qualify for the public student loan forgiveness program. Are you aware of that?

Dr. LITTLEWOOD. I was aware of that, yes.

Mr. SWALWELL. And so my experience—and maybe you could tell me if it's different at Argonne or other national laboratories—is that these scientists are, you know, for all intents and purposes, they are committed to serving our government. They are career scientists. They're likely not going to leave, but they're ineligible for a program that other federal employees are eligible for.

Dr. LITTLEWOOD. That's correct. So you're quite right to say that, you know, we have truly dedicated staff. We of course have lots of very close collaborations with Livermore and Sandia. So we know them very well. And these are staff who are dedicated to public service. They're not officially federal employees.

Mr. SWALWELL. Do you think that it would help you recruit, attract, and retain these bright scientists if we were able to make

them eligible for the public student loan forgiveness program? And I'd open that up also to the other participants as well.

Dr. LITTLEWOOD. I mean, I've not thought in detail about it, but it seems very clear. I will say that the labs have some concern about recruitment over the years, particularly my colleagues who run weapons labs. It's very important for them to be able to recruit actually very substantial numbers of scientists and in particular, those who are able to hold a clearance. And so we're actually collectively very concerned about pipeline issues and anything that we can do to bring people into this area of public service is something I would support.

Mr. SWALWELL. Great. Thank you. And maybe the other witnesses who studied in our national laboratories, is this an issue that we should look at opening up and making lab employees who are not today eligible, making them eligible for—in the program, just so you know, if you make 120 payments serving the public, maybe as a teacher, maybe as a prosecutor, maybe as a public defender, 120 payments, the balance of your student loans is forgiven. But lab employees don't qualify.

Mr. GLAUTHIER. Congressman, I think it's a very interesting proposal and not one that we studied in our work. But we did look at the issue about attracting and retaining, you know, really qualified people for these laboratories and particularly the weapons labs, such as Livermore. And it is a real challenge. So there are several of our recommendations that speak to that. One is the increase or restoration of the LDRD level of funding—

Mr. SWALWELL. That's right.

Mr. GLAUTHIER. —which is very important at the weapons labs. As Dr. Cohon has said from his background in universities, our universities today do not train weapons designers. That's done at three facilities in the country, and people need to be brought in who are very bright and trained in disciplines that are relevant and then given the opportunity to work in these areas. To bring them in is best done through funding like the LDRD programs.

We also address our recommendations on facilities and infrastructure to these areas as well. The run-down state of some of the facilities has been an impediment to recruiting and retaining really top-quality people, and those labs that have been able to build new facilities, new office buildings, new research facilities have seen the resulting benefits in their recruiting processes, too. I think your proposal is an element that would fit in very constructively to that program.

Mr. SWALWELL. Thank you, and I hope my colleagues on the other side would entertain that. It's something our offices have been working on with other member offices with laboratories. But I do share a belief that, you know, these scientists who work on national security programs shouldn't be treated any differently when the eligibility is considered for student loan forgiveness once they serve for ten years. So I yield back.

Chairman WEBER. The gentleman yields back. The other gentleman from California is recognized for five minutes.

Mr. ROHRABACHER. Thank you very much. Let me just note there are contractors not just in the labs. There are contractors throughout the federal government, many of them risking their lives, hav-

ing operations overseas with our military and our intelligence agencies. And that's—whether or not we want to do it for contractors what we do for a federal employee is something that is also designated by ballot—excuse me, by budget issues which if we indeed say all federal employees are going to—all federal contractors will get every right as a federal employee, yes, it'll cost the federal government more money and thus there may be less money for research projects in their labs because we have a limited amount of money we're dealing with here. But maybe that is the best use of the money, getting the best contractors you can to work for you might be worth it. But we—

Mr. SWALWELL. Would the gentleman yield for just 15 seconds?

Mr. ROHRABACHER. Sure. Sure, go right ahead.

Mr. SWALWELL. And thank you. And I certainly agree with you because a lot of the contractors work for a year, two years at a time, and this federal program which was already funded requires ten years of service.

Mr. ROHRABACHER. Okay.

Mr. SWALWELL. Thank you, and I yield back.

Mr. ROHRABACHER. All right. Well, we'll be taking a look at it I'm sure. I have been looking at this. We have, what, 17 national labs, and their budget is \$14.3 billion of which \$11.7 billion comes from the Department of Energy. And that represents—that \$11 billion represents 82 percent of the funding for the national labs. Yet of the national labs, there's a great discrepancy in terms of how much of their project is actually being financed that way. For example, Fermi National Accelerator Lab receives 100 percent of its funding from the Department of Energy but the Savannah River National Lab only receives less than seven percent of its total budget. Now, where's that other money coming from? If it's not coming from DOE, where's it coming from?

Mr. GLAUTHIER. Congressman, thank you. The laboratories at Savannah River is an unusual case because so much of that site is actually the environmental management work. And so I'd point to some of the other labs such as the Pacific Northwest Lab or Sandia Lab where there's a large percentage, 30 percent or more of the total funding of the laboratory comes from other sources. Those tend to be the Department of Homeland Security, Department of Defense, the intelligence community.

Mr. ROHRABACHER. How much of it is private sector?

Mr. GLAUTHIER. A very small amount actually comes from the private sector. I don't have the percentage at hand, but I would say it's certainly less than five percent. It's probably 1 or 2 percent.

Mr. ROHRABACHER. Okay. So if the private sector is involved with using these labs, they—do they then pay? They're paying rent for their—they're paying for the use of the facility, is that it?

Mr. GLAUTHIER. For work that they do that is proprietary, that is, such as the pharmaceutical companies who test all of their new drugs in the light sources of the Department, they pay full cost recovery. So when they're using those, they pay the total cost of the resources that they use. If they're engaged in partnerships where they're doing early stage basic research that's going to be published and they're not going to have any patent rights to it or anything, then they don't have to pay for that.

Mr. ROHRABACHER. Well, what if they do have it or are private companies now receiving patents for the work that they did in the national labs?

Mr. GLAUTHIER. Yes, and Dr. Littlewood might be in a position to actually give some examples of that.

Dr. LITTLEWOOD. Well, yeah. So often what happens of course is that there is research which is done in the national labs that is licensed to private companies.

Mr. ROHRABACHER. Right. And I — but does the federal government get an ownership share or a profit share in something that we have been provided for these private companies?

Dr. LITTLEWOOD. Well, the — we're regulated in this really by the Bayh-Dole Act.

Mr. ROHRABACHER. Say that again?

Dr. LITTLEWOOD. Bayh-Dole Act. So going back to 1980, the ability actually to take federally funded research and license it to private companies were effectively regulated in the same way that a university would be over that license.

And then there are other examples where we do what one might call—well, what are explicitly cooperative Research and Development Agreements, where we agree in advance to do collaborative work with industry. With an agreement in advance about what will happen to the IP portfolio?

Mr. ROHRABACHER. Yeah. Let me just note that I think it's a good thing that we have companies and other government agencies utilizing this asset. That's why we've invested in it and I think we do, if it's possible, we're always looking for some way because we're operating on deficit right now. But by and large, the idea of having our companies in the United States and other government agencies have that capabilities they wouldn't have otherwise is a good thing. And that's what it's all about. So thank you very much.

Chairman WEBER. The gentleman yields back. I now recognize my good friend that serviced on the Texas Legislature with me until we got demoted. Mr. Veasey?

Mr. VEASEY. Thank you, Mr. Chairman. I appreciate that. And I had a question for Mr. Glauthier and Dr. Cohon about the report about the National Laboratories and finding new ways to be able to work with universities and wanted to ask, were you able to particularly identify any notable obstacles that prevented labs from being able to work with universities?

Dr. COHON. No, Congressman. We think that the relationships now among the laboratories in many universities are really very good and no major obstacles for further collaboration. We underline it in our report because we think it's so critical, both for the laboratories and the universities. But there are no major barriers to that. We want to of course see it stay that way.

Mr. VEASEY. Are there any things that you think Congress can do to even further encourage those relationships?

Dr. COHON. Probably hearings like this and asking questions like that is a good way to do it, sending the message that it's a desirable thing to see those kinds of collaborations go forward. Dr. Littlewood has a lot of experience with this, and I'm guessing he's going to agree that there are no obstacles to this. Let's not create any.



Dr. LITTLEWOOD. Indeed. So I would comment on that. So, you know, as an examples and Argonne isn't very different from any of the other science labs. We actually have 200 joint appointments with local universities. I've talked about joint research programs that we go together.

But I will say that for us, the ability to work with universities in a regional context is beginning to be even more important because universities engage in their region. They engage with business, and they begin to form the ecosystems actually that can brings the lab in to be more effective in tech transfer. So in Chicago, University of Chicago has the Chicago information exchange, innovation exchange, which Argonne is part of because we have this relationship with the university. That connects us to a much broader ecosystem that would be difficult for a lab that's got a fence around it. So actually, the universities often can be a ways out for us to work with the broader community. What I will say, however, is that indeed I think we try very hard to have good relationships with their university colleagues. I think there are a few barriers at the moment. I hope we don't create any.

Dr. COHON. Could I just follow on that? I'm really glad that Dr. Littlewood brought that up, this idea of collaborating with universities regionally for regional economic development. Argonne stands out among the 17 labs in being both open and proactive in that regard. We, our Commission in our report, signal—not Argonne now but the opportunity for that kind of engagement in regional economic development is a potential that's not being realized by most of the labs. And doing it collaboratively with regional universities is a very good idea. So seeing much more of that I think would be a very good thing.

Mr. GLAUTHIER. May I add one more thought?

Mr. VEASEY. Yes, please.

Mr. GLAUTHIER. And that is that the role of the DOE labs in building and operating user facilities is very important for this collaboration of the university community, and sometimes it's not understood that the Department of Energy is operating facilities that are used by grantees from the National Institutes of Health or from NSF or others and that role of the laboratories is a very important one. And so Congress could continue to really embrace that and be sure that those facilities are for widespread use by researchers in all fields.

Mr. VEASEY. Thank you very much for your answers. Mr. Chairman, I yield back the balance of my time.

Chairman WEBER. All right. Mr. Foster, you are up for five minutes. Welcome.

Mr. FOSTER. Thank you very much, and I would like to thank Chairman Weber and Ranking Member Grayson for allowing me to sit in on this subcommittee hearing. While I don't sit on the committee, I spent 23 years of my life as an employee of Fermi National Accelerator Lab and now I'm one of two members that represent Argonne National Lab.

And I have to start out by saying that I resonate very strongly with the comments you've made on the risks of excessive risk aversion, that this is something that we—those of you who've lived through the Tiger Teams. You remember that? Yes? Okay. Yes.

You're bowing your heads appropriately. Let the record show that they nodded with a wry smile.

You know, these sort of things represent an overreaction that typically——

Chairman WEBER. So ordered, without objection. But can you spell wry for it?

Mr. FOSTER. W-r-y.

Chairman WEBER. All right. I thank the gentleman.

Mr. FOSTER. Anyway, you know, very often this starts when something bad does happen, you know, there's an injury or something like this or a security breach. And so there's a newspaper story, frankly an overreaction in Congress, and this gets amplified down the command chain at every step at every level in the bureaucracy, someone wants to make sure that everyone reporting to them absolutely isn't the one that trips over whatever rules are established. As a result, by the time it gets down to the working level, sometimes these have morphed into really silly things like tracking down 20-year-old computers. And I have strong memories as I was checking out a Fermi lab, having to track down computers I had not seen in 20 years that were just sitting around collecting dust somewhere. And this is because probably at some point, someone—you know, there are bad apples everywhere—someone stole some computers, and there was a story about it.

And so I think that, when I'm trying to figure out what the rules that you should be held to on this, I think it's useful to segment the truly unique things we do, the part of your work that's, you know, nuclear reactors or weapons, stuff like this, where there are really unique risks. From the probably 90 percent of what you do that is just ordinary things that can be compared to industry and if the standards you were held to was really industry best practices, you know, you have to deal with roadway safety on your laboratories, okay, as do big industrial plants. And I think that when you compare your safety record for roads, comparing it to what industry does would be a much more reasonable standard. And part of that is that when something happens, Congress has to have a more mature reaction. You know, we are seeing in today's politics Members of Congress standing up and saying I want to guarantee that there is a zero percent probability that anyone we let into this country from certain other countries will turn out to be a terrorist. And when you hold people to unreasonable standards, unachievable standards, then you end up with bad results.

Anyway, so I was wondering if you have a reaction to using industry as a benchmark at least for the part of your work that is comparable to what's done in industry? Any reactions as to——

Dr. LITTLEWOOD. Well, actually, let me comment. In fact, we do that particularly over safety. So you know, as part of our oversight process, I have a board. You know, my board of course has a safety committee. My board is actually a rather distinguished board that has captains of industry, former Senators, people who want to understand these things very well. And we use that board and their oversight role to manage the lab in ways that we think are appropriate.

As I think you're pointing out, many of the rules and regulations that we face are things that we have to do and I don't believe help the operation of the lab.

Mr. FOSTER. Right, and so do you have an observation about what altitude in the command chain most of these unhelpful regulations are generated at?

Dr. LITTLEWOOD. I think the regulations may have been dealt, delivered initially at high altitude but without understanding the consequences. They then become imbedded in the system at low altitudes and are impossible to remove. And it may well be that as you say, some of these things we could fix ourselves if we actually had the courage to just go in there and take this out. And so I'll comment that the Secretary himself has formed a task force to look at what he calls an evolutionary model to try and dig out this, you know, cobwebby stuff which has just collected over the years.

Mr. GLAUCHIER. If I might, one of the things that previous commissions have done often is to recommend that the Department should review all its directives and orders and you know, eliminate the ones that aren't needed. We took a different approach. We said there are many situations where you shouldn't even have to use Department of Energy rules or anything, that in settings where you're trying to build an office building, for example. It's non-nuclear, non-high hazard, it's not in a classified area. Then you ought to be able to have the option, the laboratory have the option of using the standards that are in place in the community, in the state in which you operate. And we cite some examples where in California, for example, there are some electrical wiring standards for wiring an office building that Stanford has been recently doing. The Department of Energy has these three that we've cited that were issued in 2006. Those are the ones that contractors are supposed to use in the real world. In the rest of the world those haven't been updated three times since then so that the IBEW, electricians who are out there working on these sites have standards that are in fact being used throughout Silicon Valley, and they should use those standards for just a regular building and that sort. We think that's one of the elements. Just give the laboratories that option to go with the standards that are the appropriate ones in the area.

Mr. FOSTER. Thank you. I yield back.

Chairman WEBER. Gentleman yields back. I thank the witnesses for your valuable testimony and the members for their questions. The record will remain open for two weeks for additional comments and written questions from members, including those who got wry smiles.

Mr. FOSTER. Mr. Chairman?

Chairman WEBER. Yes.

Mr. FOSTER. Would it be possible for me to have another couple minutes of questioning for—because this is so dear to my heart?

Chairman WEBER. Yes, I'm good with that.

Mr. FOSTER. All right. Thank you. I very much appreciate it. You mentioned one of the Commission's recommendations is restoring LDRD to six percent, and this is something—I was wondering if you—you know, what is magic about six percent. Do you think as a general matter of principle that if the fraction of money—I'm not

talking about increasing the pot—but if the fraction of money was delivered as LDRD was increases or decreased, whether it would result in an increase in the, you know, innovation and the efficiency of laboratories?

Mr. GLAUTHIER. Congressman, if we could, the level of six percent that was without overhead burden is what the laboratories—it's a ceiling. So not all laboratories would do that, and of course, many of the laboratories have decided to use lower rates. But the weapons labs especially find that it's so important, particularly in attracting and retaining their employees, that they do need to have substantial levels. That six percent is the level that they were using at points where it was unconstrained, where the government authorized LDRD but didn't have a cap on it. And so our recommendation is to return to the levels that they had found as effective levels at that time.

Mr. FOSTER. Is the decrease that we've seen in LDRD just a reflection of the fact the budgets have been squeezed and that that's one of the places you can—you know, if there's some fat—not fat to trim but you know, some optional things.

Mr. GLAUTHIER. It's been a Congressional direction. The change in 2006 was to add a requirement to put overhead rates on that, and they increased the cap from 6 to eight percent, but the overhead rate effectively made it less than it had been before. And then that's been restricted further in the last couple of years.

Mr. FOSTER. Okay. And then finally, do you think it would be useful to have an explicit follow-up to this report, to have actually action items and have you come back because there's a long history of really very high-quality reports that have gathered dust. And what's needed frankly to my mind is an explicit follow-up, that six months or a year from now you come back and say here are our action items and here, what we've done in response to them.

Mr. GLAUTHIER. Yes, but our recommendation is that there would be a value to having a standing body of some sort set up so that it would not just be to look at the regulations of this Commission but to be able to be a resource to the Congress on the implementation of these and the implementation of the Augustine-Mies Commission a year ago and the recommendations of another National Academy Report that Dick Meserve chaired and whatnot. And as new issues arise, as a problem does come up at some lab and the Congress wants to get the perspective of some group of experienced people outside an independent view, that that kind of a body could be a group you'd turn to rather than having to create a new commission.

So we would encourage you to think broadly about how you could accomplish that, how you can get that kind of oversight and support but definitely on these recommendations and on the whole broader category.

Mr. FOSTER. Thank you and appreciate it and yield back.

Chairman WEBER. Before the gentleman yields back, Bill, tell us again. You worked in the labs how long?

Mr. FOSTER. Twenty-three years at Fermi National Accelerator Lab with collaborators at many national laboratories.

Chairman WEBER. In what capacity?

Mr. FOSTER. I was an accelerator designer and builder. I designed and built large-particle accelerator, accelerator components and detectors. I'm probably the only Member of Congress that's designed and built a 100,000 ampere superconducting power transmission line. I don't want to overreach—

Chairman WEBER. Which is why I'm saying we're glad to have you here today. Welcome. Thank you. And I do want to mention that we've got a bill that we should be dropping tomorrow, Dr. Littlewood, called the Nuclear Energy Innovation Capabilities Act. We actually worked with Mark Peters on this bill, and it's going to be doing three things. Of course it's on advanced reactors, modeling, and simulation. Number one, we're wanting to focus on a fast research reactor. Then we're also wanting to allow private reactor prototypes at DOE sites. So I thought you'd find that interesting. Yes, sir.

Dr. LITTLEWOOD. Yeah, I actually look forward to that because we're very proud to have Mark Peters as an alumnus of Argonne go on to be Director of Idaho National Lab. So that's one of the things that we like to do for the Nation.

I think that by the way, particularly in the reactor area, I'd like to comment that Idaho, Argonne, and Oak Ridge are very much in synchrony on wanting to push forward the next generation of nuclear reactors. I'd like the United States to have some options in 2050.

Chairman WEBER. Absolutely, and we would, too. And Aaron corrected me here. He actually testified on the bill is what I meant. And we do have bipartisan—Eddie Bernice Johnson is co-authoring the bill with us. And so if my good friends here on the right will co-sign on with that bill while we have a good possibility we're going to get it through.

I do thank the witnesses for your valuable testimony and members for their questions. Again, Bill, we appreciate you being here. The record will remain open for two weeks for additional comments and written questions from the members. The hearing is adjourned.

[Whereupon, at 3:29 p.m., the Subcommittee was adjourned.]



## Appendix I

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### ANSWERS TO POST-HEARING QUESTIONS

ANSWERS TO POST-HEARING QUESTIONS

*Responses by Mr. TJ Glauthier & Dr. Jared Cohon*

**U.S. HOUSE OF REPRESENTATIVES  
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY  
Subcommittee on Energy Hearing: Recommendations of the Commission to  
Review the Effectiveness of the National Energy Laboratories  
November 18, 2015**

**Hearing Questions for the Record:  
The Honorable Randy Hultgren  
February 16, 2016**

- 1. In recommendation 33, you talk about DOE, the labs, Congress and OMB working together to identify appropriate situations and methods for innovative financing approaches. The Committee has worked for some time to include third-party financing for certain nuclear facilities. What else do we in Congress need to be doing as a part of this recommendation?**

**Response from the Commission's co-chairs, TJ Glauthier and Jared Cohon:**

Thank you for your question. There are two ways in which the Congress could be effective in supporting DOE and the laboratories in this area. One is to authorize Enhanced Use Lease authority to DOE. The other is to authorize a pilot project for DOE to utilize third party financing for, say, five projects and then evaluate the effectiveness of that financing approach.

Despite the magnitude of need to maintain and revitalize the National Laboratory system, not to mention the cost to build the next generation of scientific facilities, innovative financing mechanisms have been largely unavailable to DOE and its laboratories: no DOE R&D facilities projects using alternative financing have moved forward since 2007. This is unfortunate given that such financing mechanisms would allow the laboratories to pursue various important projects otherwise not possible in times of budget austerity. There are two areas in which the Congress could play an important role in reestablishing the use of innovative approaches to financing much needed construction projects at the laboratories.

The first involves Enhanced Use Leases (EULs). EULs are long-term leases on agency-owned property in exchange for cash or in-kind consideration. For example, non-contaminated excess facilities at DOE laboratories could be leased to interested third parties, thereby addressing the Department's facilities resource needs, while offloading some of its excess square footage. In some cases, this might be used to finance renewable energy projects on site. Unfortunately DOE currently does not possess Enhanced Use Lease (EUL) authority, which is derived from Congress and is specific to each agency. The Department of Defense (DOD) and the Veterans Administration (VA) have such authority and temporary authority has also been granted to the General Services Agency (GSA) and the National Aeronautics and



Space Administration (NASA). By granting Enhanced Use Lease authority to DOE, the Congress would provide another resource for the Department to address its facility's needs.

The second area in which the Congress could play an important role is best illustrated by alternative financing through the use of operating leases. In this approach the Federal Government contributes the real property or land and a private entity provides the initial capital to develop or renovate it. A lease agreement allows non-Federal entities or contractors to occupy the real property for a defined time period while the agency repays the financed amount through lease payments. Although critics argue that DOE should not be allowed to commit to a long-term "mortgage" when there is no guarantee the Nation will continue to see a mission need for maintaining a laboratory, there has been very little independent analysis of alternative financing, particularly cost benefit analyses. For this reason the Commission would encourage Congress, working together with DOE and its laboratories, to identify and establish a pilot program that can serve as an exemplar of the use of innovative approaches to financing much needed work at the DOE laboratories. A set of principles could be developed for such a pilot program to ensure that it meets appropriate Federal financial criteria.

- 2. In recommendations 25, 26 and 27, the commission looked at things we should be doing to improve our technology transfer capabilities. I think this is one of the most important things our labs do. One question I do have, moving forward, is how should DOE balance the needs of our multipurpose and single purpose labs in this space? Do we need different metrics for labs that have different missions?**

**Response from the Commission's co-chairs, TJ Glauthier and Jared Cohon:**

In our report, the Commission noted that all offices of DOE and all its laboratories should embrace the technology transfer mission of the agency due to its importance for the nation. Naturally, there are clear differences in emphasis on and mechanisms used for technology transfer between the applied National Laboratories and the basic science labs, but the broad responsibility is shared by all of them. That is also true when comparing the multi-purpose and single-purpose laboratories. Regardless of the mechanism used to transfer their technology, the economic impact of the research carried out at the single-purpose laboratories has been significant. For example, the accelerator and advanced magnet technology developed at the Fermi National Accelerator Laboratory (FNAL) and at SLAC National Accelerator Laboratory have played an important role in medical science and research. With the advancement of accelerator science, new techniques for the treatment of cancer and diagnosis of various diseases have contributed significantly to major steps forward in medicine. Moreover, diagnostic techniques such as Magnetic Resonance Imaging (MRI) rely on the magnetic technology developed at these single-purpose laboratories.

With this perspective, the Commission does not believe that a different set of metrics is needed for laboratories with different missions. It is important, however, to recognize that each laboratory will likely have its own approach to technology transfer and economic development, reflecting the laboratory's unique mission, culture and geographic setting. Different laboratories will also have different levels of technology transfer activity and so it is also important that the expectations regarding laboratories such as FNAL and NREL should also be different. Since researchers will be more likely to participate in technology transfer activities if they feel the leadership at both their laboratory and DOE is supportive of their efforts, the Commission stresses the importance of a positive culture for engaging in technology transfer and partnering with industry at both the multi-purpose and single-purpose laboratories.

*Responses by Dr. Peter Littlewood*

**U.S. HOUSE OF REPRESENTATIVES  
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY  
Subcommittee on Energy**

**Hearing Questions for the Record  
The Honorable Randy Hultgren**

*Recommendations of the Commission to Review the Effectiveness of the National Energy  
Laboratories*

**Questions for Dr. Littlewood**

1. In recommendations 25, 26 and 27, the commission looked at things we should be doing to improve our technology transfer capabilities. I think this is one of the most important things our labs do. One question I do have, moving forward, is how should DOE balance the needs of our multipurpose and single purpose labs in this space? Do we need different metrics for labs that have different missions?
  - Single-purpose labs, such as the Fermi National Acceleratory Laboratory (Fermilab) concentrate on one program that requires extensive scientific expertise. Multipurpose labs, such as Argonne National Laboratory (ANL) conduct research in many cross-cutting programs and hold expertise in numerous scientific disciplines.
  - While it is generally true that, despite focus on a single program area, technology transfer contributions can be made in a number of diverse fields (for example, Fermilab, a single-purpose high energy physics laboratory, has contributed to technology transfer in fields as diverse as cancer imaging and power-plant flue-gas cleanup), it is reasonable to expect multi-purpose labs to be able to participate more broadly in technology transition activities than single-purpose labs.
  - A preferred perspective is one that (a) understands that each Lab operates within varying and distinct realms of technologies, and their correlating business environments, and that (b) allows some flexibility in how each Lab articulates meaningful objectives to fulfill its own technology transfer mission, consistent with its own technology space and operating contract. This perspective can, in addition, leverage the variance that exists within the DoE Lab ecosystem to promote experimentation that might allow successful activities to be trialed and adapted more readily.
  - In addition, technology transition/commercialization is affected through a portfolio of different models and actions i.e. there is no one 'silver bullet' approach to commercialization success.
  - Models for achieving successful technology transitions depend upon a number of factors such as the nature and maturity of the technology, the application-market and dynamics thereof, motivations, opportunities and constraints of the commercialization partner-entities, motivations, opportunities and constraints of the Lab technologists, the regional innovation ecosystem that the Lab is co-located with, etc. To cite just one example, technology transition opportunities with start-up firms are typically quite different between Lawrence Berkeley Lab, a multipurpose Lab located close to the Silicon Valley, as compared to Ames Lab, a single-program Lab located in Ames, Iowa, by virtue of location alone.

- Given the large number of factors that impact technology transfer outcomes and the variance that exists within the DoE Lab ecosystem, customized metrics for labs that have different missions will allow for technology transfer efforts that are specific and relevant to the individual Labs, ultimately leading to superior outcomes. A key driver of such outcomes will be an emphasis from DoE to elevate technology transfer as a priority for the Labs and to adequately resource the overall technology transfer mission.

## Appendix II

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ADDITIONAL MATERIAL FOR THE RECORD

RESPONSE FROM COMMISSION TO REVIEW THE EFFECTIVENESS  
OF THE NATIONAL ENERGY LABORATORIES



U.S. DEPARTMENT OF  
**ENERGY**

**Departmental Response to the  
Final Report of the  
Commission to Review the  
Effectiveness of the National  
Energy Laboratories**

**Report to Congress  
February 2016**

United States Department of Energy  
Washington, DC 20585

### Message from the Secretary

The Department of Energy (DOE) is, at its core, a science and technology organization that advances critical missions for the American people: nuclear security; scientific leadership and discovery; clean energy innovation and energy security; emergency response; technology transfer; and environmental remediation. DOE's National Laboratories are key to mission success across the broad spectrum of DOE's responsibilities.

The National Laboratories comprise the most comprehensive research network of its kind in the world, and they are essential links in the Nation's innovation chain. Each has distinctive capabilities; together, they are greater than the sum of their parts. Individually and collectively, the Labs conduct cutting-edge fundamental and applied scientific research, develop problem-solving technologies, and are one of the Nation's most effective "on call" resources for tackling unprecedented challenges – from the threat of unsecured nuclear materials as the Soviet Union collapsed, to the Macondo oil spill in the Gulf of Mexico, to the Fukushima nuclear disaster, to deep and rapid scientific analyses for the Iran nuclear negotiations.

The National Laboratories are an indispensable part of the American research enterprise, creating knowledge at the scientific frontier and housing major scientific facilities used by over thirty thousand university, laboratory and industry researchers annually. Core enabling technologies – such as high performance computers and modeling of complex physical systems and particle accelerators – are continuously pushed to new heights. In addition, completely new directions are established for the research community, such as launching human genomics and then developing the genomics field for energy. In turn, these advances have contributed greatly over many decades to ensuring the competitiveness of U.S. industry and of the broader economy. Well over a hundred science Nobel Prizes have been directly associated with DOE National Laboratory research.

The labs also have helped spark the energy revolution, from early work on drilling technologies and basin characterization for shale gas to materials discovery, advanced manufacturing techniques, and other research that has driven down the cost of wind and solar, batteries and LEDs, and continues to do so.

And of course the labs are core national security assets, sustaining the nuclear deterrent without testing, securing dangerous nuclear materials worldwide and propelling the nuclear

Navy, and providing critical technology and analysis for the Departments of Defense and Homeland Security and the intelligence community.

These unique and invaluable capabilities must be developed, sustained, and nurtured over decades. Sound stewardship of the laboratories has been one of my highest priorities as Secretary. Top talent must be attracted and retained by providing a vibrant research environment focused on challenging problems that call upon multidisciplinary teams integrating scientific, engineering, and management expertise.

This stewardship and further strengthening of the National Lab enterprise is both a major responsibility of and opportunity for DOE in service of the national interest. Recognizing that success in this endeavor has vital national consequences and meets critical national needs, Congress directed formation of the Commission to Review the Effectiveness of the National Energy Laboratories (CRENEL).

I thank the Commission for its conscientious and serious work. In formulating its recommendations, the Commission visited all 17 DOE National Laboratories, interviewed staff in more than 100 offices across government and other sectors, and heard testimony by 85 witnesses at public Commission meetings. There is no doubt that the Commission's findings and recommendations are thoroughly researched and a testament to the leadership of its Co-Chairs, Jared Cohon and TJ Glauthier. The Department has carefully considered each of the Commission's findings and recommendations in formulating this response.

In addition, I have asked for input from the National Laboratory Directors' Council (NLDC), which is comprised of the Directors of all 17 National Laboratories, and the Secretary of Energy Advisory Board (SEAB), a Federal Advisory Committee of experts outside the Department that provides advice to me on key issues. Both have provided me with thoughtful views to help shape our response to the CRENEL report; their feedback is attached to this Departmental response.

A central finding of the Commission reinforces the unparalleled value of the National Laboratory system to the Nation, serving as a science and technology powerhouse, and occupying a critical role that cannot be carried out solely by universities or the private sector. However, the report also notes that since the end of the Cold War, oversight by DOE has grown increasingly transactional rather than strategically mission-driven. One of my priorities as Secretary has been to reset this critical relationship – to improve the strategic partnership between the Department and the National Laboratories and, in emphasizing an enterprise-wide



approach to the lab system, to help maximize their unique role in the Nation's innovation ecosystem.

The Commission also recognized the importance of an overarching strategic approach for the laboratories. Steps that I have taken in recent years to underscore the value of such an approach include:

- reorganizing the Department to integrate and better coordinate basic research and applied energy programs under a single Under Secretary for Science and Energy;
- establishing a Laboratory Policy Council and a Laboratory Operations Board to convene a senior-level strategic dialogue on key priorities and improve the effectiveness and efficiency of the laboratories' execution of the DOE mission;
- strengthening project management, including by establishing a Project Management Risk Committee, restructuring the Energy Systems Acquisition Advisory Board, and reinforcing the independent peer review process;
- launching cross-cutting research initiatives that involve coordinated efforts between DOE and multiple laboratories;
- creating an annual Big Ideas Summit that convenes lab scientists and Departmental program leadership to generate new mission-related research challenges of importance to the Nation;
- initiating an integrated approach to cyber issues through the establishment of the DOE Cyber Council, in which the labs are called upon to play a significant role; and
- inaugurating a Technology Commercialization Fund for National Laboratory collaboration with the private sector on energy technology development.

Not only do these and other changes make it possible for the labs to become engaged in providing substantive input about research directions for the Department, but also they have helped to form networks of labs with complementary capabilities to deliver results. All of these steps have been focused on reinvigorating the strategic partnership necessary for effective stewardship of the laboratories as Federally Funded Research and Development Centers (FFRDCs).

The Commission's report appropriately focuses on the importance of the FFRDC model in providing an environment in which DOE sets the mission needs and provides oversight, while the managing contractor and laboratory leadership and staff put together the teams and structure programs in response to the mission needs, all in the public interest. The CRENEL effort has contributed to our re-examination of the management framework for the National

Laboratory system and how it can best serve the public interest. In addressing the Commission's findings and recommendations, the Department's response articulates and defines core objectives that embody this concept of lab management and stewardship. These objectives, along with the related recommendations from the Commission, are as follows:

- Identify and provide necessary resources by conducting rigorous, comprehensive strategic planning across DOE, to include the laboratories in the process (Recommendations 1, 20)
- Assist Congress in its role of reviewing the laboratories by promoting greater transparency with Congress and the taxpayer (Recommendations 1, 2, 30, 36)
- Implement laboratory stewardship through partnership (Recommendations 2, 3, 4, 6, 9, 12, 21)
- Clarify roles and responsibilities (Recommendations 5, 10, 11)
- Improve the development and implementation of requirements; improve the laboratory oversight environment (Recommendations 7, 8, 13, 14, 15, 18)
- Improve annual laboratory planning and evaluation (Recommendations 3, 16, 20)
- Manage the laboratories as a system, seeking to achieve maximum benefit for the Nation (Recommendations 17, 19)
- Beyond revising strategic planning, examine procedures to allow laboratories flexibility to maintain excellence in the expertise of research staff (Recommendations 18, 19, and 21)
- Enhance laboratory mission-aligned collaboration with stakeholders and the broader science and technology community (Recommendations 22, 23, 24, 25, 26, 27, 28)
- Continue to develop the Institutional Cost Report (ICR) (Recommendations 29, 30)
- Revitalize laboratory infrastructure, reduce the risk of excess facilities, and improve project management (Recommendations 31, 32, 33, 34, 35)

It is evident that we have a shared vision for a National Laboratory system focused on innovation, partnership, and stewardship that sustains the DOE laboratories as a science and technology powerhouse for the Nation. The CRENEL report, as well as inputs from SEAB and the lab directors, will continue to help guide progress towards this vital imperative.

Sincerely,



Ernest J. Moniz



## Departmental Response to the Final Report of the Commission to Review the Effectiveness of the National Energy Laboratories

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## 1 INTRODUCTION

Congress, through Section 319 of the Consolidated Appropriations Act, 2014 (Public Law 113-76), directed the Secretary of Energy to establish an independent commission known as the Commission to Review the Effectiveness of the National Energy Laboratories (Commission). In the legislation, Congress asked that the Commission review the 17 Department of Energy (DOE) National Laboratories with respect to their alignment with DOE's strategic priorities, duplication, ability to meet current and future energy and national security challenges, size, and support of other Federal agencies. Congress also asked the Commission to consider whether there are opportunities to more effectively and efficiently use the capabilities of the National Laboratories, and to analyze the effectiveness of the use of laboratory directed research and development (LDRD) to meet DOE's science, energy, and national security goals.

The Secretary established the independent Commission in May 2014, and it published its Final Report in October 2015. In its report, the Commission concluded that the DOE laboratories are "a unique scientific resource and national security asset, providing a vital experimental infrastructure to the Nation's research community and sustaining the nuclear weapons expertise crucial to modern American security" and are "a national treasure with the potential to serve the nation now and well into the future." The Commission noted that, while the DOE laboratories serve the Nation well, they could be even more effective and efficient if they and DOE improve their relationship, focusing on the principles of stewardship, accountability, competition, and partnership inherent in the fundamental model of Federally Funded Research and Development Centers (FFRDC).<sup>1</sup> To that end, the Commission offered 36 recommendations for improvement that focus on six key themes.

As reflected in the Message from the Secretary, DOE agrees with the Commission that the DOE laboratories provide unparalleled value to the Nation, serving as a science and technology powerhouse and occupying a critical role that cannot be carried out solely by universities or the private sector. The laboratories produce innovations that spur the Nation's economy, play a critical role in our national security, and serve as a key catalyst for clean energy development

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<sup>1</sup> Pursuant to U.S. Code of Federal Regulations, Title 48, Part 35, Section 35.017, "An FFRDC meets some special long-term research or development need which cannot be met as effectively by existing in-house or contractor resources. FFRDC's enable agencies to use private sector resources to accomplish tasks that are integral to the mission and operation of the sponsoring agency. ...FFRDC's are operated, managed, and/or administered by either a university or consortium of universities, other not-for-profit or nonprofit organization, or an industrial firm, as an autonomous organization or as an identifiable separate operating unit of a parent organization."

and climate mitigation strategies. Continued investments in the laboratories, coupled with effective and efficient stewardship, are critical to strengthening and preserving this vital partnership.

## **2 RESPONSE**

DOE's response to the Commission is organized around the six themes articulated by the Commission in its report: (1) recognizing value, (2) rebuilding trust, (3) maintaining alignment and quality, (4) maximizing impact, (5) managing effectiveness and efficiency, and (6) ensuring lasting change. For those themes, DOE has identified specific objectives which articulate strategic outcomes that DOE seeks to achieve to effectuate its vision of laboratory stewardship and partnership, and to respond to the Commission's findings, conclusions, and recommendations. The response then details those actions that DOE is engaged in, or will commit to execute, to accomplish these objectives.

### **2.1 RECOGNIZING VALUE**

The DOE National Laboratory system consists of 17 laboratories, each with a core mission and core programmatic sponsor at DOE. Of the 17 laboratories, 16 are operated through Management and Operating (M&O) contracts. Some National Laboratories are focused on a single DOE program, while others have a core program that is strengthened by work performed for other DOE programs and sometimes for other government entities (such as DOD or DHS) or private sector partners. DOE uses its laboratories to support and develop its priorities in program areas, and also develops and executes cross-cutting programs across the laboratories.

The Commission notes that a culture of scientific excellence, technical rigor, and mission-focused vision has defined the National Laboratories throughout their history and allowed them to serve the United States time and again. The Commission highlighted the unique and collaborative role that the National Laboratories play in solving highly complex, multi-disciplinary, long-term projects that span the basic sciences to research and development (R&D). This collaboration includes university partnerships, working with other Federal agencies, the private sector, and more than 31,000 academic and industrial scientists who carry out research at DOE's user facilities. More than 100 DOE laboratory-affiliated researchers have been awarded Nobel Prizes, and the National Laboratories have received over 800 R&D 100 Awards since 1962. Given this positive impact, the Commission concluded that sustained Federal support of R&D at the National Laboratories is critical to the future of the science and technology enterprise as well as the Nation's economy and security. By making the laboratory system as efficient as possible and ensuring that it focuses on important endeavors not

otherwise being addressed, DOE can maximize the quality of these R&D accomplishments of the laboratories.

#### Commission Recommendations

Under the theme “recognizing value,” the Commission provided the following recommendation:<sup>2</sup>

*Recommendation 1: The National Energy Laboratories provide great value to the Nation in their service to DOE’s mission, the needs of the broader national science and technology community, and the security needs of the Nation as a whole. The Administration and Congress should provide the necessary resources to maintain these critical capabilities and facilities. It would also benefit all stakeholders if the key committees in Congress would develop a more orderly process of reviewing the National Laboratories, to replace the unrelenting pace of studies evaluating the performance of the DOE laboratories.*

#### Discussion

DOE agrees with the Commission’s conclusion that the National Laboratories provide great value to the Nation in their service to DOE’s mission, the needs of the broader national science and technology community, and the security needs of the Nation as a whole. The substance of this first recommendation involves actions by DOE and by Congress. While DOE does not have a response to the Commission’s recommendations to Congress, it recognizes that DOE’s actions can facilitate Congressional understanding and evaluation of the laboratories’ contributions and performance.

DOE views the Commission’s recommendation that it provide the necessary resources to maintain the critical capabilities and facilities of the laboratories in the broad framework of a strategic partnership with the laboratories that emphasizes performance. The following principles guide DOE’s efforts to improve this partnership, so that it continues to provide value to DOE and the Nation as a whole:

- Creating an institutional environment with necessary and sufficient Federal oversight that enables laboratories to best serve the public interest with objectivity and independence and take reasonable risk in the pursuit of innovation

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<sup>2</sup> In the body of this report, Commission recommendations are stated in summary form. The full text of Commission recommendations is provided in the Appendix.

- Encouraging laboratory employees to maintain their world-class capabilities and talents in their field(s) of expertise
- Ensuring that laboratories can provide a quick response capability to DOE and its other strategic partners
- Promoting transparency between DOE, the laboratories, the government more broadly, and the public
- Facilitating the ability of the Laboratories to perform cutting edge research for other entities in the national interest

DOE's approach, then, to implementing this recommendation is twofold. First, DOE will continue and enhance its comprehensive planning processes, including involving the laboratories in these planning efforts, to establish strategic direction and priorities, ensuring that DOE makes the most of the available resources. Second, DOE will improve transparency with Congress and with the taxpayer regarding how it is using those resources in the best interest of the Nation. The specific actions described here are intended to meet these two objectives.

#### Specific Actions

**OBJECTIVE:** Identify and provide necessary resources by conducting rigorous, comprehensive strategic planning across DOE, to include the laboratories in this process (*Recommendations 1, 20*)

Current Strategic Planning Efforts. DOE currently conducts its strategic planning through the preparation of a series of key studies and documents. They span the range from Administration-wide policy studies to program-specific strategies.

- With respect to DOE's energy programs, the foundational planning drivers for policy and programmatic decisions are the Quadrennial Energy Review (QER) and the Quadrennial Technology Review (QTR). They are designed to evaluate the current state of energy-related science and technology, policy, infrastructure, and other energy-linked challenges to the economy, environmental quality, and national security, and identify opportunities and recommendations. The QER is an Administration-wide policy process, led by the White House Domestic Policy Council and Office of Science and Technology Policy. DOE plays a critical role in the QER and is responsible for conducting the analysis, drafting the report, stakeholder outreach, and supporting interagency coordination. Unlike other Federal Quadrennial Review processes where an analysis is done every four years, the QER is conducted through installments to allow for granular analysis of key energy sub-sectors.

The QTR is a planning process specific to DOE. It explores the current state of technologies in key energy sectors and R&D opportunities present in the mid-term. It is intended to frame a blueprint for DOE energy technology development and the enabling science for future technology breakthroughs.

- With respect to DOE's national security responsibilities, the National Nuclear Security Administration (NNSA) produces two comprehensive planning documents that integrate programmatic requirements across laboratories, plants, and sites. The Stockpile Stewardship and Management Plan (SSMP) is DOE NNSA's 25-year strategic program of record for maintaining the safety, security, and effectiveness of the nuclear stockpile. The SSMP is published annually, in response to statutory requirements, in report or summary form, to support the President's Budget submission to Congress for Weapons Activities. As recommended by the Secretary of Energy Advisory Board (SEAB) Task Force on Nuclear Nonproliferation, a new report, Prevent, Counter, and Respond – A Strategic Plan to Reduce Global Nuclear Threats, articulates for the first time, in a single document, the NNSA programs to reduce the threat of nuclear nonproliferation and nuclear terrorism. As such, it serves as a companion document to the annual SSMP.
- The results from these foundational reports on DOE's energy and national security responsibilities are integrated into DOE's Strategic Plan. DOE's most recent Strategic Plan for 2014–2018, published in March 2014, is a comprehensive blueprint to guide the agency's core missions and provides a roadmap for the work of DOE, highlights major priorities, and provides the basis for individual DOE program plans.

Future Laboratory Participation. The National Laboratories are already important partners in the development of DOE's key strategic planning documents. They provide important technical input and expertise that informs DOE's analysis and planning efforts. Each of these documents will be refreshed on a periodic basis to reflect the evolving challenges, technologies, and opportunities facing DOE in the execution of its missions. As part of its efforts to strengthen its partnership with the National Laboratories, DOE will continue to engage with them in developing future updates to these documents.

**OBJECTIVE:** Assist Congress in its role of reviewing the laboratories by promoting greater transparency with Congress and with the taxpayer (*Recommendations 1, 2, 30, 36*)

Starting in 2016, DOE will begin providing an annual report to Congress on the State of the Laboratory System. The purpose of the report will be to describe key initiatives of the National Laboratories, including how the system as a whole is serving the Nation through collective and



cross-cutting activities. It also will articulate DOE's operational successes and continued challenges in stewarding the laboratories, including DOE's status in implementing key actions described in this response. The first of these reports will be more comprehensive, providing a history and background on the National Laboratories and establishing a foundation for future annual updates. Developing the annual updates will be a collaborative effort among the three Under Secretary offices, facilitated by the Laboratory Operations Board (LOB). The annual report will be endorsed by the Laboratory Policy Council (LPC) and issued by the Secretary.

DOE also will continue to conduct Lab Day on the Hill events. The first, held in September 2014, included Laboratory Directors and representatives from all 17 National Laboratories and showcased demonstration projects across five theme areas – energy innovation and environmental sustainability, manufacturing innovations, high performance computing, national security, and discovery science. The second, in July 2015, highlighted the National Laboratory system's scientific and technological contributions towards developing America's new energy infrastructure, focusing on: grid modernization, sub-surface science, sustainable transportation, and integrated energy systems. In October 2015, Lab Day focused on the role of the National Laboratories in nuclear nonproliferation, national defense, homeland security and counter terrorism, emergency response, and stockpile stewardship. The next, Science Day on the Hill, is planned for April 2016, and an Environmental Stewardship Day on the Hill is planned for fall 2016. These events are a valuable tool not only to share the good work of DOE and its laboratories but also to raise the laboratory system's awareness of broader Congressional interests and to hear feedback from stakeholders.

## **2.2 REBUILDING TRUST**

The Commission noted that a basic premise of the FFRDC/M&O model is trust. The Commission stated that "the government is responsible for setting the '*what*' of strategic program direction to meet the Nation's needs, while contracted university and industry partners are responsible for determining precisely '*how*' to meet the technical and scientific challenges and to carry out programs." The Commission noted that a strength of this model when it is working properly is to provide freedom to innovate without overly intrusive management. The Commission observed that trust between DOE and the laboratories has eroded, which has resulted in overly prescriptive management in some areas. The Commission also recognized, however, that "there is significant improvement being made in this area under the current Secretary and directors of the National Laboratories, and wishes to support these and other steps" including

reactivating the National Laboratory Directors' Council (NLDC), the LOB, and other forums for collaboration of various groups within DOE and the laboratories.

#### **Commission Recommendations**

Under the theme "rebuilding trust," the Commission provided the following recommendations:

*Recommendation 2: DOE should delegate more authority and flexibility to the laboratories and hold them accountable for results. The laboratories must be transparent with DOE.*

*Recommendation 3: DOE and each laboratory should cooperatively develop a high level annual operating plan, and DOE should provide increased flexibility and authority to the laboratory within that framework.*

*Recommendation 4: DOE should implement greater leadership and management development for its Federal workforce, including multi-directional rotational assignments.*

*Recommendation 5: DOE should separate NETL's research and development function and consider converting it to a government-owned, contractor-operated FFRDC. NETL should increase its interactions and collaboration with universities.*

*Recommendation 6: DOE should abandon incentive award fees in the M&O contracts in favor of a fixed fee set at competitive rates. DOE should adopt a broader and richer set of incentives and consequences to motivate sound laboratory management and enforce accountability.*

*Recommendation 7: For non-nuclear, non-high-hazard, unclassified activities, DOE should allow laboratories to use Federal, State, and national standards in place of DOE requirements. DOE should review and minimize approval processes.*

*Recommendation 8: DOE should modify its processes for developing directives, orders and other requirements to more fully engage subject matter experts and to use a risk-based model.*

*Recommendation 9: DOE should focus on making the use of Contractor Assurance System (CAS) more uniform across the laboratories, and local overseers should rely on information from the CAS systems.*

*Recommendation 10: The role of the site office should be emphasized as one of "mission support," with all staff in the site office reporting to the site office manager. DOE should devote more effort to leadership training and professional development of field staff.*

Recommendation 11: *DOE should clarify the role and authority of the support centers and align all authorities at either the site office or DOE headquarters, as appropriate.*

Recommendation 12: *All stakeholders should make maximum use of local assessments performed by site offices and laboratories.*

Recommendation 13: *DOE should establish a single point of control—within the Department or each stewarding program office—for all laboratory-directed data requests.*

Recommendation 14: *DOE and its program offices should increase the size of funding increments, extend timelines and minimize milestones for each increment, and institutionalize mechanisms for laboratory flexibility to move money between budget codes.*

Recommendation 15: *Congress should repeal Section 301(d) of the FY 2015 Consolidated Appropriations Act as soon as feasible to remedy the transactional burden it creates for OMB, DOE Headquarters, and the laboratories when operating under a continuing resolution.*

#### Discussion

DOE agrees with the Commission that there is a need to return to the spirit of the FFRDC model. FFRDCs enable government agencies to work with private sector partners to accomplish tasks that are integral to the mission and operation of the sponsoring agency. The FFRDC is required to conduct its business in a manner befitting its special relationship with the government, to operate in the public interest with objectivity and independence and with full transparency to its sponsoring agency. To do this, DOE and the National Laboratories must work together as partners to restore the ideal nature of the FFRDC relationship as a culture of trust and accountability. To that end, the specific actions outlined here focus on achieving three objectives: (1) implement Laboratory stewardship through partnership, (2) clarify roles and responsibilities, and (3) improve the development and implementation of requirements, as well as the laboratory oversight environment.

#### Specific Actions

**OBJECTIVE: Implement laboratory stewardship through partnership (*Recommendations 2, 3, 4, 6, 12, 21*)**

Existing Initiatives. Consistent with the FFRDC model, DOE will ensure its laboratory stewardship responsibilities are founded on the trusting partnership that must exist between Federal and laboratory leadership. Maintaining this partnership requires developing a strong set of tools that will allow all DOE programs to consistently and effectively partner with the

laboratories; delegating authorities to the laboratories where warranted; and investing in leadership development for both Federal and laboratory staff. DOE has established two joint Federal-Laboratory bodies that provide the leadership and enterprise-wide coordination to effectuate this commitment to a partnership model: the LPC and the LOB.

- In July 2013, the Secretary established the Laboratory Policy Council (LPC) to provide a forum to include the National Laboratories in strategic discussions of DOE's policy and program planning process, and for DOE to provide strategic guidance on National Laboratory activities. The LPC, chaired by the Secretary and comprised of senior DOE leadership and the National Laboratories Directors' Council Executive Committee, convenes three times a year and serves as an important forum for exploring nascent proposals related to new research directions, building human capacity, and improving communications; discussing progress and guidance on initiatives, such as technology transition pilots and emergency response. Discussions within the LPC have focused on crosscutting Departmental initiatives, DOE-lab studies by external bodies, management challenges, and workforce and leadership diversity.
- The Laboratory Operations Board was chartered in October 2013, with a charge "to strengthen and enhance the partnership between DOE and the National Laboratories, and to improve management and performance." One of its early efforts illustrates the enterprise-wide impact of the group: the LOB led a first-ever enterprise wide assessment of general purpose infrastructure across all 17 National Laboratories and NNSA sites and plants, using newly-established metrics to provide a uniform assessment of infrastructure such as utilities, HVAC systems, and office buildings. This initiative provided the basis for an additional \$106 million requested by DOE, and funded by Congress in the Fiscal Year (FY) 2016 appropriations, targeted for general purpose infrastructure projects. Since then, the LOB has led DOE on other operations and management issues ranging from the strategic – e.g. coordinating a similar enterprise-wide effort to provide updated assessments and prioritization of unused and contaminated "excess" facilities, to the targeted – e.g. updating Departmental policy on Strategic Partnership Projects and then building a community of practice to promulgate best practices and streamline approvals.
- The LPC and LOB have proven to be successful partnership forums where issues can be raised and solutions can be debated with relevant stakeholders engaged. These bodies will continue to play an important role in providing insight into key Departmental strategy and management issues. They are closely integrated with the laboratory leadership, as the executive committee of the NLDC sits on the LPC, and the chairs of the laboratory Chief Operating Officer and Chief Research Officer working groups are members of the LOB. The

charters of these two key leadership groups will be amended to clearly establish that a key focus area of each initiative should be to address issues counter to the DOE/laboratory partnership, and to establish mechanisms to identify and remedy those as they arise.

Increasing Flexibility and Accountability through Annual Operating Plans. DOE appreciates the recommendation from the Commission regarding annual operating plans, which would reflect high-level agreements on the nature and scope of the laboratory's activities. As discussed below in Section 2.3, DOE has already embarked on an effort to improve the existing annual planning process as well as the performance management process through DOE's existing annual Performance Evaluation and Management Plans (PEMPs). These improvements are responsive to some of the increased transparency, accountability, and predictability of laboratory planning that the Commission's report recommends, and DOE is currently evaluating whether existing Departmental mechanisms can be further enhanced to address the Commission's concerns. In addition to these ongoing efforts to strengthen annual laboratory planning and evaluation processes, DOE is undertaking a number of other steps.

- DOE also is evaluating whether a pilot of the annual operating plan concept at one or two National Laboratories (or areas within a laboratory) would result in added streamlined management without creating a duplicative process.<sup>3</sup> Any pilot effort would be focused on establishing a high-level understanding and agreement on the laboratory's planned work for the year, which could then be used to guide and expedite various approval processes throughout the course of the year.
- As a result of related recommendations from SEAB, DOE has initiated an "evolutionary" working group effort to identify specific authorities that can be delegated, on a pilot basis at Fermi National Accelerator Laboratory, to improve efficiency and reduce transactional oversight. Some of the recommendations for this group likely will lead to changes to Departmental-wide policies.
- Similarly, DOE has initiated a second "revolutionary" working group to examine the laboratory contract structure at the Stanford Linear Accelerator Center, with the objective of developing a more streamlined approach to improve the partnership and reduce transactional oversight.

Leadership Development Rotational Assignments. The LOB has established a working group with the DOE Chief Human Capital Officer (CHCO) to develop and implement a pilot for a

<sup>3</sup> In comments to DOE on the Commission report, the Executive Committee of the National Laboratory Directors' Council raised a concern that a new annual operating plan might be duplicative of current requirements such as the PEMP.

leadership development rotational program that would offer DOE Federal and laboratory mid-level and senior employees opportunities to rotate to laboratory or Federal sites. These rotational assignments would provide opportunities for a detail to a limited-term team that is focused on a unique project or solving a complex problem; longer term assignments also would be considered on a case-by-case basis. The rotational program, to be run by the CHCO office and anticipated to begin in 2016, is intended to promote greater common understanding of the management challenges and opportunities between the laboratories and the Federal employees, and to strengthen partnership and trust.

Incentive Award Fees. With respect to the M&O contract incentive structure, the Commission's recommendations are most applicable to the NNSA contracts. Informed by feedback from the M&O community, NNSA is developing an M&O overarching procurement strategy guide that will include contract structure and incentive guidance for use when each specific acquisition strategy is initiated and approved for future competitions of NNSA's M&O contracts. This new contracting strategy will identify the appropriate application of incentive and fixed fee for NNSA contracts when the procurements for those contracts arise.

**OBJECTIVE: Clarify roles and responsibilities (*Recommendations 5, 10, 11*)**

Headquarters and Field Management. In general, program management responsibility and strategic direction reside at DOE Headquarters whereas field offices provide day-to-day implementation and are advocates for mission work at the sites. DOE is taking steps to clarify the roles and responsibilities of the headquarters, program, field, and laboratory organizations. This will help strengthen the partnership between DOE and the labs and improve the implementation of core operational mechanisms and risk management, such as the Contractor Assurance System (CAS).

A working group of the LOB is developing a DOE/Laboratory Management Framework document to be completed in 2016, which will describe the current operational framework across the Department, identify those parts of the framework that have added value to the DOE/laboratory relationship, and articulate core management principles relevant to the DOE/laboratory relationship to be implemented by the Under Secretaries.

Each DOE program will review its field authorities and structure as part of this effort, including to ensure that Contracting Officers report to line managers. In addition, each program will formalize a field manager training and professional development program that provides for effective workforce planning and instills an understanding of "mission support" as the primary site office role.

In particular, NNSA will execute plans to improve its governance and oversight of field operations at its laboratories, sites, and plants and clarifying roles and responsibilities. The new approach will clarify the oversight roles of headquarters and field office personnel, placing emphasis on new rigorous and dependable Contractor Assurance Systems (described below), and leveraging best practices from the Office of Science, including enhancing peer review and corporate parent involvement as appropriate for each site. In addition, to manage and eliminate duplication in field oversight, NNSA's field offices will use a Site Integrated Assessment Plan (SIAP) to identify their annual oversight requirements. This effort is intended to result in a consolidated schedule across all field offices and to assign resources based on expertise and functional area.

National Energy Technology Laboratory. The Commission also recommends for National Energy Technology Laboratory (NETL), the only DOE National Laboratory that is government owned and government operated (GOGO), that there is a need for "significantly increased clarity and focus on the R&D mission for the research staff at NETL and for others outside NETL who work with them." The Commission recommends that DOE should separate NETL's R&D function from its management of Federal programs, and that the R&D function should be converted to "a government-owned contractor-operated FFRDC."

While DOE agrees there is a need for increased focus on the R&D conducted by NETL's scientists, the Department notes that there are several ways to pursue such a focus. In the near term, focus on the R&D can be better achieved by integrating and synchronizing NETL's intramural and extramural research portfolio. This integration will better focus NETL's research, enhance NETL's collaborations with researchers in academia, industry, and other National Laboratories, and increase NETL's ability to consistently provide better science and research results. The Office of Fossil Energy recognizes the need to enhance NETL parity with other GOGOs within the Federal government by giving flexibility and discretion to drive innovation through mechanisms similar to those authorized by the National Defense Authorization Act. These mechanisms permit discretionary funds to strengthen scientific and technical vitality and create a flexible personnel system (e.g., direct-hire authority for scientific and engineering positions, broad-banded pay systems, simplified job classification, contribution-based compensation system, and enhanced training and development) to attract and retain scientific and technical expertise.

**OBJECTIVE:** Improve the development and implementation of requirements; improve the laboratory oversight environment (*Recommendations 7, 8, 9, 13, 14, 15, 18*)

DOE has initiated a comprehensive review of how, when, and why it establishes its own set of requirements, with a charge to take a fresh look at mechanisms including directives, policy memoranda, and acquisition letters. A workshop with a wide set of perspectives (both Federal and laboratory) is being convened in early 2016 with the goal of identifying specific challenges to tackle; it will be sponsored by the LOB and co-chaired by a Federal and a laboratory employee. Part of that effort is expected to discuss DOE requirements that are duplicative of Federal, State and National standards and whether there are circumstances where laboratories should be able to use those standards in place of DOE requirements. The effort also will evaluate proposals to streamline the processes for developing directives and other requirements.

In addition, the Commission noted that data calls “can often arrive at the laboratories without being sufficiently vetted or filtered.” The Commission indicated that the Office of Science (SC) has reduced the number of data calls by establishing a single point of contact for data requests for all of its 10 laboratories. Consistent with the Commission’s recommendation, NNSA and the programs that oversee the applied laboratories plan to evaluate the process used in SC and determine what actions would be appropriate for their programs and their respective laboratories.

The Commission report also recommended that DOE identify opportunities to reduce the transactional burden associated with funding allotments, as well as to evaluate whether Congress should repeal Section 301(d) of the FY 2015 Consolidated Appropriations Act.

DOE is limited in the actions it can take without Congress to reduce the subdivision of funding into smaller “buckets.” The annual appropriations act for DOE subdivides DOE’s funding into more than 500 legally-binding control points, as enforced by section 301(d). Additional control points also are sometimes established administratively through the OMB apportionment process and the internal DOE funds distribution process.

DOE’s Office of the Chief Financial Officer (CFO) has been working with the program offices to reduce the subdivision of funds below the Congressional control points. As the Commission points out, the DOE Office of Energy Efficiency and Renewable Energy has recently moved towards larger grants with longer periods of performance and fewer milestones and reporting requirements. In addition, increased transparency should reduce the introduction of control points.



The Section 301 (d) restriction can be troublesome during periods when DOE funding is provided through Continuing Resolutions rather than through an annual appropriations Act. Because the Continuing Resolution typically provides funding at the same level and under the same terms and conditions as the prior year appropriation, it can significantly restrict flexibility as programs transition to the new fiscal year. Also, because a Continuing Resolution is typically enacted for short periods of time, there may not be adequate time to process reprogrammings to address issues where additional program flexibility may be needed. The Administration succeeded in obtaining a waiver of section 301 for the NNSA Weapons Activities appropriation in the FY 2013 full year continuing resolution. No other DOE programs received a section 301(d) waiver in the FY 2013 continuing resolution, and reprogrammings—often requiring months for formulation and Congressional approval—were required to reallocate funds to address requirements. Congress has not waived the provision in any subsequent continuing resolutions or conference appropriations Acts. DOE would work with the House and Senate Appropriations Committees if they choose to repeal section 301(d) to develop mechanisms that will preserve Congressional oversight and ensure Departmental accountability while improving management efficiency and effectiveness. In addition, DOE is exploring mechanisms for better integrating disparate funding streams to have a larger impact, such as is being done in the Grid Modernization Laboratory Consortium.

With respect to the oversight environment, the Contractor Assurance Systems (CAS) will continue to serve as a system for the contractor to manage performance consistent with contract requirements. Under this system, the oversight of activities with potentially high consequences is given high priority and greater emphasis. In addition, DOE oversight programs are designed and conducted commensurate with the level of risk of the activities. A working group led by the LOB has been reviewing how the various offices operate CAS at the laboratories under their purview and is developing a policy document which articulates high-level CAS principles, to help further more uniform application across the complex. These principles of Contractor Assurance, roles/responsibilities, and levels of risk acceptance underlie DOE/laboratory interactions, and so these core CAS principles will be incorporated into the DOE/Laboratory Management Framework document described above. In addition, NNSA is in the process of updating its CAS process to more closely mirror the Office of Science model, to include using peer reviews to analyze the strength of the CAS systems.

In the areas of Federal safety and security oversight, DOE has enhanced the way oversight is conducted organizationally, procedurally, and operationally. In 2014, the Secretary established the Office of Enterprise Assessments to consolidate and manage all independent safety and security assessments within DOE. At the same time, the Office of Environment, Health, Safety,

and Security was established to serve as the organization responsible for policy development and technical assistance; safety analysis; and corporate safety and security programs. These actions provided a clear distinction between operational awareness and independent oversight responsibilities. DOE will continue to work to improve the oversight process, including addressing duplication where appropriate and sharing best practices.

### 2.3 MAINTAINING ALIGNMENT AND QUALITY

The Commission's report noted the critical role of DOE in providing strategic direction to the laboratory system. The Commission indicates what it finds to be a lack of a comprehensive strategic planning process across DOE, but states that it finds that the laboratories' "research programs and capabilities are generally well-aligned with DOE's missions and strategic priorities." The Commission provides recommendations for improving planning efforts at DOE, including adopting elements of the Office of Science strategic planning process more broadly across DOE.

#### Commission Recommendations

Under the theme "maintaining alignment and quality," the Commission provided the following recommendations:

*Recommendation 16: Other DOE program offices should adapt the procedures and processes that DOE's Office of Science has for guiding and assessing the alignment of the laboratories with DOE's missions and priorities.*

*Recommendation 17: The processes that the Office of Science has in place for assessing the quality of laboratory research and the quality of the research portfolio in each of its programs, should be adapted by the other DOE program offices.*

*Recommendation 18: There must be a government-wide reconsideration of the conference travel restrictions.*

*Recommendation 19: The Commission strongly endorses LDRD programs and supports restoring the cap on LDRD to 6 percent unburdened, or its equivalent.*

*Recommendation 20: DOE should manage the National Laboratories as a system having an overarching strategic plan that gives the laboratories flexibility. Once the research has matured to the point that a preferred or most promising approach can be identified, the Department should provide strategic oversight and guidance to coordinate and consolidate programs.*

Recommendation 21: *Congress should recognize that the technical capabilities currently housed within the NNSA laboratories are essential to the Nation. Maintaining the nuclear explosive package capabilities in separate and independent facilities has proven effective and should continue.*

#### Discussion

DOE agrees with the Commission that strategic planning involving both DOE and the laboratories is critical to advancing the strategic direction of the laboratory system. To that end, DOE has identified three objectives: (1) improve laboratory planning and evaluation; (2) manage the laboratories as a system, seeking to achieve maximum benefit for the Nation; and (3) beyond revising strategic planning, examine procedures to allow Laboratories flexibility to maintain excellence in the expertise of research staff.

#### Specific Actions

**OBJECTIVE:** Improve annual laboratory planning and evaluation (*Recommendations 3, 16, 20*)

The Secretary has initiated several efforts to bring more consistency to the management and oversight of the DOE laboratories, and DOE has established an Agency Priority Goal for FY 2016-FY 2017 (and related Strategy) that will ensure focus is maintained on these efforts (see box).

First, DOE has already begun to develop a consistent annual laboratory planning approach to track and assess laboratory planning and evaluation. In this effort, DOE is establishing a Laboratory Planning Working Group, convened by the Under Secretary for Science and Energy and with participation from NNSA and the Office of Environmental Management, to create a framework for consistent laboratory planning processes. Consistent with Commission recommendations 16 and 17, NNSA and the applied energy offices will model their revised processes using core elements and attributes from the lab planning process used by the Office of Science (SC). As is done in SC, the annual laboratory plans will inform the PEMP, infrastructure plans, and 10-Year Site Plans. A key element for programs and Under Secretarial offices is to ensure that these annual planning

**Agency Priority Goal:** Deliver the highest quality R&D and production capabilities, strengthen partnerships with DOE headquarters, and improve management of the physical infrastructure of the National Laboratories to enable efficient leadership in science, technology, and national security.

**Strategy** - Develop and implement a consistent, annual process to track and assess laboratory planning and evaluation.

efforts provide senior-level vision and direction that will help better integrate efforts rather than simply adding another process or level of review.

Second, DOE has efforts underway regarding improvements to annual laboratory planning. Specifically, NNSA is working to improve its strategic planning process and partnership efforts by establishing a laboratory strategic planning function in the NNSA Office of Policy within the Office of the Administrator. NNSA will work with each of the Lab Directors and NNSA field office managers to establish this new process, which will include an annual high-level strategic discussion at which each Laboratory Director presents his or her long-term strategic vision, to include the complex factors and competing objectives that each national laboratory balances, while continuing to assure national security mission success. The discussion will also include longer-term issues that the Director considers vital to the mission success of the laboratory.

Third, the Office of the Under Secretary for Science and Energy has initiated efforts to improve the annual lab planning processes for the applied energy laboratories under its purview. The Office is developing coordinated and uniform guidance for applied energy labs to submit an Annual Laboratory Plan which will track the process and timing used in the Office of Science. The process will also include presentations by the laboratories of its key priorities.

Finally, the Office of Environmental Management (EM), will establish an entity that is responsible for the stewardship of Savannah River National Laboratory. This entity will manage the process for annual laboratory program guidance, planning, and evaluation, and will serve as a focal point for other key laboratory stewardship activities, such as Strategic Partnership Projects (SPP) and LDRD. EM will implement a planning and evaluation process with core elements and attributes developed from the Office of Science model.

In addition to these annual lab planning improvements, DOE also has efforts underway to make the lab performance management process more uniform across DOE. In 2014, the Office of the Under Secretary for Science and Energy chartered a Laboratory Performance Management Working Group to better align the processes used by the program offices to annually evaluate the laboratories' performance, using the Office of Science PEMP process as a model. This group developed several recommendations that are being implemented by DOE, through the Under Secretaries, in FY 2016. The recommendations provide for: consistent annual laboratory performance plans across all laboratories with common hierarchy; standard nomenclature and definitions of terms; the identification and evaluation of a laboratory's leadership role in cross-cutting initiatives with inter-laboratory collaboration (e.g., Grid Modernization); and performance feedback from all major sponsors (both DOE and non-DOE) of work at a laboratory. In 2016, the Under Secretary for Science and Energy will integrate this ongoing

effort to improve the PEMP process with the new annual laboratory planning approach described above.

**OBJECTIVE:** Manage the Laboratories as a system, seeking to achieve maximum benefit for the Nation (*Recommendations 17, 19*)

A number of the efforts described above go to the efforts to manage the laboratories as a system. This includes the enterprise-wide bodies that provide strategic direction and vision to improve the lab partnership—including the LPC and the LOB—as well as the cross-departmental laboratory planning and performance working group that seek to not just improve planning at a single laboratory, but to better integrate planning across the system. In addition, the Departmental reorganization of the Under Secretary offices moved the basic research and applied energy programs under the newly-established Under Secretary for Science and Energy to better coordinate lab research and development activities. DOE will use future updates of the Science and Energy Plan, the NNSA SSMP, and the report entitled “Prevent, Counter, and Respond – A Strategic Plan to Reduce Global Nuclear Threats,” to articulate decisions pertaining to an appropriate level of duplication of research and synergies in the DOE-laboratory crosscuts.

Moreover, DOE will continue collaboration through DOE-laboratory crosscuts, and will use the enhanced lab planning approach to inform, for example, crosscutting teams, and plans and proposals submitted to the National Laboratory Big Ideas Summit. The Under Secretary for Science and Energy will continue to sponsor an annual National Laboratory Big Ideas Summit, which brings together subject matter experts from DOE’s science and energy offices as well as the Office of Energy Policy and Systems Analysis, the NNSA, and all 17 National Laboratories (including their Directors and senior research staff) to propose and explore innovative ideas for solutions to key energy issues. The first Summit resulted in major Departmental initiatives in FY 2015 and FY 2016, including the Grid Modernization Laboratory Consortium, which is led by two Federal and two Laboratory representatives.

**OBJECTIVE:** Beyond revising strategic planning, examine procedures to allow Laboratories flexibility to maintain excellence in the expertise of research staff. (*Recommendations 18, 19 and 21*)

Through discussions with the National Laboratory Directors’ Council (NLDC) and their working groups, as well as through the LPC and LOB, DOE will continue to identify additional methods and mechanisms to manage the Laboratories as a system with maximum flexibility to pursue new, mission-relevant lines of inquiry.

Of particular note, DOE welcomes the Commission's support for LDRD programs. The LDRD Program provides the laboratories with the opportunity and flexibility to establish and maintain an environment that encourages and supports creativity and innovation, and contributes to their long-term viability. LDRD allows DOE's laboratories to position themselves to advance the national security mission and respond to the Nation's future research needs. The Commission recommended that Congress restore the cap on LDRD to 6 percent unburdened, or its equivalent, noting that this will have the largest impact on LDRD at the NNSA laboratories. The recently-enacted FY 2016 National Defense Authorization Act increased funding for LDRD with a minimum rate of 5 percent and a maximum of 7 percent of the NNSA laboratories' operating budgets, a level more consistent with historic NNSA levels.

DOE also is working to promulgate best practices on LDRD throughout DOE. DOE will establish a best practices process in FY 2016 to help the National Laboratories improve the flow of outcomes from LDRD to missions. This working group, led by NNSA but involving the other Under Secretary offices as well, also will develop an electronic forum in 2016 to document and share best practices. In FY 2016, DOE will issue a LDRD Highlights document; NNSA also will share the individual annual lab reports with Congress and provide an annual briefing for stakeholders on the benefits realized due to LDRD investments.

In regard to conference management procedures, as the Commission notes, DOE has taken efforts to revise and refine the existing processes, including to streamline administrative actions and reduce transactional oversight, while meeting all legal requirements and maintaining appropriate management controls to ensure cost-effectiveness.

DOE also is streamlining its approval requirements relating to laboratory employee benefits to provide laboratories greater flexibility to manage their workforce. Among these changes, following the issuance of the Commission's report, in January 2016 DOE revised its process to eliminate prior approval of new or revised benefit plan changes, with the exception of changes that result in increased costs or that are contrary to Departmental policy or written instructions. DOE also agrees that the timing of its process for reviewing pension funding plans should be addressed and is working to streamline those processes.

## 2.4 MAXIMIZING IMPACT

The Commission finds that the "National Laboratories represent a national asset of inestimable value" but notes that more can be done to tap the capabilities of the laboratories, especially in support of economic competitiveness. The laboratories interact with stakeholders beyond DOE – including other Federal agencies and the private sector. The Commission states that more

can be done to broaden collaboration and to make the laboratories run efficiently and effectively.

#### **Commission Recommendations**

Under the theme “maximizing impact,” the Commission provided the following recommendations:

*Recommendation 22: DOE should establish policies and procedures to make the Strategic Partnership Projects (SPP) process more efficient.*

*Recommendation 23: DOE should support efforts to strengthen the Mission Executive Council.*

*Recommendation 24: DOE and its laboratories should continue to facilitate and encourage engagement with universities.*

*Recommendation 25: DOE should fully embrace the technology transition mission and continue improving the speed and effectiveness of collaborations. Innovative technology transfer and commercialization mechanisms and best practices should continue to be pursued.*

*Recommendation 26: DOE should determine whether the annual operating plans could qualify as the “agency approved strategic plan” under the Stevenson-Wydler Technology Innovation Act of 1980, and the Fast-Track CRADA Program. For CRADAs with non-standard terms and conditions, DOE should define the acceptable range for each term and condition to greatly expedite negotiation and review/approval time.*

*Recommendation 27: Laboratories should pursue innovation-based economic development by partnering with regional universities.*

*Recommendation 28: DOE, the Administration and Congress should continue to support user facilities at the DOE laboratories, including peer review by external advisory groups.*

#### **Discussion**

DOE agrees that the laboratories’ engagement with Federal and private sector partners is a vital element of their mission. The DOE laboratories are major national scientific and technical assets whose contributions to the United States at large, and in areas beyond the DOE missions, are significant. In addition, the DOE laboratories can play a regional role in supporting universities and community colleges by providing partnering opportunities and serving as a conduit to the broader laboratory network. DOE’s objective in this area is as follows: enhance

laboratory mission-aligned collaboration with stakeholders and the broader science and technology community.

#### Specific Actions

**OBJECTIVE:** Enhance laboratory mission-aligned collaboration with stakeholders and the broader science and technology community (*Recommendations 22, 23, 24, 25, 26, 27, 28*)

In the area of Strategic Partnership Projects (SPP), the Secretary recently issued an updated policy document which sets forth the principles for DOE's strategic engagement with partners from other Federal agencies and the private sector. This policy makes clear that DOE is committed to expanding the use of its laboratories and other sites for the benefit of its strategic partners. This work must be consistent with or complementary to DOE's missions or the facility to which the work is to be assigned. The work also should enhance or make use of the facility's core capabilities, but does not need to be associated with a specific mission of the "owning" program. Additionally, the work must not adversely impact DOE programs, result in direct competition with the domestic private sector, or create a detrimental future burden on DOE resources.

In addition, under the leadership of the LOB, DOE established a community of practice on SPP to ensure communication of best practices across the complex. The community of practice held its first annual SPP summit in March 2015 and continues to meet to discuss ways to enhance collaboration and streamline processes. Within NNSA, the Office of Strategic Partnership Programs has created a task force of laboratory and Federal personnel, including potential SPP partner representatives, to improve the SPP program, processes, and procedures. The task force will undertake an in depth look at the current process to identify efficiencies, an analysis of other mechanisms to place work, including umbrella agreements, and a discussion on appropriate metrics. Proposed changes to the NNSA SPP approval process are expected to be implemented in late FY 2016.

The Commission also recommends that DOE "support efforts to strengthen the MEC." The Mission Executive Council (MEC) was established to bring a more strategic understanding of the capabilities needed for the labs and facilities to serve the agencies' missions. While DOE is committed to the future success of the MEC, further development of this strategic concept is required, as well as the involvement and commitment of the agencies for which the DOE facilities perform their work. In addition, since the MEC only represents four agencies, it would not be the proper venue to coordinate, streamline, and execute all interagency work because



many other stakeholders would not be represented. The MEC is currently pursuing an agenda focused on identifying strategic priorities and critical capabilities to address enduring national security challenges and potential technological surprises raised by the MEC Member agencies. This approach and dialogue are starting to work and will result in an actionable MEC strategic framework on specific activities for the MEC Members to execute.

DOE concurs with the Commission's recommendation on continuing to support user facilities at the laboratories. DOE will continue to support user facilities as a key part of its portfolio and will continue to use external peer review and external advisory groups to evaluate facility performance and help inform decisions on existing and future facilities. DOE also will ensure that best practices by the Office of Science for managing user facilities are incorporated into the management practices of other DOE program offices. In addition, DOE will include a discussion about user facilities in the Annual State of the Laboratory System report to emphasize the critical role they play.

In regard to supporting and accelerating DOE's Technology Transfer Mission, DOE also recognizes how technology transition activities offer ways to improve coordination of strategic activities with the laboratory enterprise. In early 2015, the Secretary established the Office of Technology Transitions (OTT) to coordinate and optimize how DOE transitions early-stage R&D to applied energy technologies through technology transfer, commercialization, and deployment activities. The OTT works with the Technology Transfer Working Group, which includes representatives from all National Laboratories, as a strategic partner providing them information about DOE activities and getting feedback from them on new technology transition programs and policies.

To further support technology transitions activities, DOE will update its 2008 Department-wide policy statement on technology transfer activities and will also develop the statutorily-required Technology Transfer Execution Plan, which will help set the strategic vision and implementation instructions for DOE. These documents will identify ways to enhance the visibility and endorse the importance of the technology transition mission. Additionally, DOE will work to provide more clarity to laboratories regarding the acceptable range for terms and conditions for non-standard CRADAs to expedite negotiation and subsequent review and approval. DOE implements both decentralized and centralized approaches to technology transfer and notes that National Laboratories currently have and employ the flexibility to interact directly with industry and negotiate agreements. DOE supports industry and laboratory interactions that are decentralized since each laboratory is unique and should develop partnerships that support the missions of DOE, and are tailored to the Laboratory's surrounding community and industry

needs, including the pursuit of innovation-based economic development. Recognizing some of the constraints of existing mechanisms, DOE has over the last few years worked to provide more flexibility through the Agreement for Commercializing Technology (ACT) pilot, which will be assessed for its ability to reduce barriers to entities that access the laboratories. DOE also will continue to encourage laboratories to build on the successful innovative mechanisms identified by the Commission for engaging industry to make collaborations easier, faster, less expensive, and more effective.

With respect to collaboration with universities, DOE agrees that its engagement with universities is a critical part of the work of DOE and its laboratories. For instance, DOE provides direct-funded grants to universities following a competitive selection process (ranging from single-investigator awards to large multi-disciplinary efforts), and also issues subcontracts to universities. One example of ongoing engagement is through the Energy Frontier Research Centers (EFRCs), which are funded by the Office of Science, and involve partnerships among universities, National Laboratories, and private sector partners to conduct fundamental research focusing on one or more grand challenges to accelerate transformative discovery in current energy technologies. Other partnerships including Energy Innovation Hubs, which are integrated research centers that combine basic and applied research with engineering to accelerate scientific discovery, and the National Network for Manufacturing and Innovation (NNMI), which provides a manufacturing research infrastructure where U.S. industry and academia collaborate to solve industry-relevant problems.

In addition, university faculty and students are actively engaged in work at DOE's laboratories; more than half of the researchers using the Departmental scientific user facilities come from universities. Collaborations between university and National Laboratory researchers take place through mechanisms such as personnel exchanges and joint faculty appointments, research collaborations, and joint research programs.

Looking forward, there will be additional opportunities to further engage with universities and impact innovation based economic development as a result of the Mission Innovation initiative. At the recent COP21 meeting in Paris, the Mission Innovation initiative was announced by the President and leaders from 19 other countries. Each of these countries pledged to double their investment in clean energy R&D over the next five years. DOE's implementation of Mission Innovation will encourage greater effort and collaboration by all participants in the innovation process – including individual innovators, universities, private companies and National Labs.

## 2.5 MANAGING EFFECTIVENESS AND EFFICIENCY

The Commission Report addresses effectiveness and efficiency in three specific areas of DOE's enterprise: overhead rates, infrastructure, and project management. Having compared overhead rates at DOE laboratories with those of university, the Commission concluded that non-NNSA laboratory rates are comparable with university rates when both are adjusted for variability in rate structures. NNSA laboratory rates were found to be higher; however, the Commission noted that the difference was understandable given the unique mission at those laboratories. The Commission also highlights that facilities and infrastructure can have a substantial impact on laboratory research operations. The Commission concludes that laboratory facilities and infrastructure in poor condition can have inadequate functionality for mission performance; negative effects on the environment, safety, and health of the site; higher maintenance costs; and problems recruiting and retaining high-quality scientists and engineers. The Commission recommended increased investment to "...maintain and revitalize the system." Finally, the Commission indicates that project performance could be improved by imposing greater discipline in following project management guidance.

### Commission Recommendations

Under the theme "managing effectiveness and efficiency," the Commission provided the following recommendations:

Recommendation 29: *DOE should continue implementing the Institutional Cost Report (ICR) and encourage additional peer reviews to help mature the ICR.*

Recommendation 30: *DOE should provide greater transparency into laboratory indirect costs and publish an annual report of the overhead rates at each National Laboratory.*

Recommendation 31: *DOE should consider whether a capital budget will better serve its internal facilities and infrastructure budgeting and management needs.*

Recommendation 32: *DOE and the laboratories should continue efforts to improve infrastructure by halting the growth in deferred maintenance and speeding up the deactivation and decommissioning of excess facilities. DOE should work with Congress and OMB to agree upon the size and nature of the resources shortfall and develop a long-term plan.*

Recommendation 33: *DOE, the laboratories, Congress, and OMB should actively work together to identify appropriate situations and methods for utilizing innovative financing approaches.*

Recommendation 34: *DOE should maintain focus on increasing institutional capability and imposing greater discipline in project management, including peer reviews and "red teams."*

Recommendation 35: *The Commission supports the recent SEAB Task Force recommendation to put more resources into science and technology development for the EM program.*

#### Discussion

DOE agrees that managing effectiveness and efficiency is a critical element to a well-functioning FFRDC partnership. Recent Departmental efforts, such as the establishment of the Under Secretary for Management and Performance, the development of the LOB, and the Departmental efforts to improve project management, have focused on this issue. DOE's objectives in this area are as follows: (1) continue to maintain the Institutional Cost Report (ICR); (2) revitalize laboratory general purpose infrastructure and reduce the risk of excess facilities; and (3) improve project management.

#### Specific Actions

##### **OBJECTIVE: Enhance the Institutional Cost Report (ICR) (*Recommendations 29, 30*)**

DOE will continue to work with the laboratories to refine and enhance the quality of the Institutional Cost Report (ICR) data. DOE initiated annual ICR reporting in FY 2011, and with the submission of FY 2015 data, will have five years of ICR data. This report provides high-level data to DOE on trends in indirect costs at the laboratories. DOE will work with the laboratories to analyze cost trends across the five years of data and continue to use the ICR data to provide supporting data, as appropriate, for DOE data calls and analyses of laboratory costs.

Detailed ICR data is shared among laboratories under a contractual term prohibiting disclosure of confidential or proprietary business information. This sharing has enabled the laboratories to perform peer reviews of the data to improve quality and consistency. Nonetheless, there are significant variations in the ICR data reflecting, in part, different accounting methods for allocation of indirect cost pools among the laboratories. DOE strongly supports the objective of improving the management efficiency of the National Laboratories through more rigorous analysis of indirect costs and actions to better control costs. The laboratory peer review process provides a needed first step, and DOE will work with the laboratories to continue and intensify the peer review process in order to gain insight into management opportunities to reduce costs. In addition, the LOB will assign greater priority to providing a forum for identifying and sharing of best practices to reduce costs across the laboratories and DOE programs consistent with relevant OMB guidance. DOE will undertake additional efforts to

improve the validation of indirect cost estimates, such as crosscutting reviews of selected indirect cost categories. Such reviews will inform additional efforts by the laboratories to manage indirect costs. DOE will also work on efforts that will lead toward consistency and promote greater transparency to the public on overhead rates in the national laboratory system within legal constraints.<sup>4</sup>

**OBJECTIVE:** Revitalize laboratory infrastructure, reduce the risk of excess facilities, and improve project management (*Recommendations 31, 32, 33, 34, 35*)

The Commission's report identifies significant challenges faced by DOE and the laboratories with degrading infrastructure and deferred maintenance and "excess" facilities that were once used for the Nation's nuclear production efforts but now are sitting unused, awaiting deactivation and decommissioning (D&D). The Commission states that "The total cost of cleanup at all DOE sites was estimated to be \$280 billion in 2013. As of 2015, EM has determined that 234 additional facilities meet its criteria for transfer to EM, but it does not have the funding to accept them for remediation. In addition to the issue of cost of surveillance and maintenance for the program offices, contaminated excess facilities continue to pose a risk to mission, workers, the public, and the environment." The Commission also notes that "the Department needs to build more project management and cost-estimating capacity. It also needs a more homogeneous and disciplined project/program management culture."

Recognizing these challenges, DOE has recently implemented an enterprise-wide focus on infrastructure planning and uniform assessments, and improving project management. This focus supports a specific strategy DOE has articulated under its Agency Priority Goal for the National Laboratories, to improve the percentage of DOE laboratory facilities assessed as "adequate" (see box).

First, last year, a LOB-led effort resulted in significant DOE-wide improvements to the rigor and consistency of infrastructure assessments, allowing more credible and reliable data for decision

**Agency Priority Goal:** Deliver the highest quality R&D and production capabilities, strengthen partnerships with DOE headquarters, and improve management of the physical infrastructure of the National Laboratories to enable efficient leadership in science, technology, and national security.

**Strategy** - By the end of FY 2017, the percentage of assessed DOE laboratory facilities categorized as "adequate" will increase by 2 percentage points from the FY 2015 baseline.

<sup>4</sup> The Commission report provided a summary comparison of indirect cost rates that illustrated the differences in the composition of indirect costs among classes of laboratories – NNSA and Non-NNSA laboratories. The Commission's analysis also suggests that total indirect costs for the non-nuclear security laboratories are commensurate with those at major research universities.

makers at all levels. This year, the focus has been on further developing an annual infrastructure status report that provides an enterprise-wide view of risks and opportunities on a timeline that will inform budget formulation and defense. Both of these efforts will continue under the leadership of the newly-formed Infrastructure Executive Committee, which consists of line managers and facilities experts from programs, labs, plants, and sites that has been charged with providing an annual update to DOE leadership on the state of general purpose infrastructure, and presenting an enterprise-wide list of prioritized investments. In FY 2016, the first year of this effort, Congress appropriated \$106 million in new investments in critical general purpose infrastructure requested by the Administration and identified through this LOB-led process. In addition, DOE's FY 2017 budget submission proposes investments to ensure no increase in the backlog of deferred maintenance at facilities across the complex.

Within individual program offices, infrastructure efforts are now an integral part of the laboratory planning and evaluation processes described in Section 2.3, above. Specifically, annual infrastructure planning processes at each laboratory are being developed that will result in a ten-year maintenance and recapitalization plan that is integrated with and fully supportive of the Annual Lab Plans. Plans will include reduction of deferred maintenance, removal of excess facilities, and proposals for potential construction of new facilities, including consideration of innovative financing approaches as recommended by the Commission. Evaluation of laboratory performance related to infrastructure stewardship will be included in laboratory performance plans. In addition, NNSA has expanded its Asset Management Program (AMP) which uses supply chain management economies-of-scale to provide a more centralized and efficient procurement approach to replacing mission-critical aging infrastructure systems that are common throughout the enterprise, such as roof and HVAC systems.

Second, in regard to removal of excess facilities, the Secretary directed the establishment of an Excess Contaminated Facilities Working Group, led by the LOB. The working group developed and executed an enterprise-wide data collection effort to obtain updated cost and risk assessments to deactivate, decontaminate, decommission, and demolish excess facilities. The updated data from the working group was used to define the scope of the challenge and to identify options for how DOE may better prioritize excess facilities. The group is developing policies to institutionalize a corporate approach, and updating and validating data gathered by the working group's efforts. The group also will be finalizing a report on its work. This report will be issued in 2016, also in response to a requirement of the 2016 National Defense Authorization Act.

Third, in 2013, the Secretary established a working group to examine project management practices at DOE. After its review, the working group issued a report identifying ways in which project management at DOE could be improved. Following these efforts, in December 2014, the Secretary issued a Secretarial policy memorandum which included additional efforts to improve project management, including: strengthening the Energy Systems Acquisition Advisory Board, establishing a Project Management Risk Committee, and improving the lines of responsibility and the peer review process. To further strengthen the independence of the project peer review process, the Secretary directed each Under Secretary to establish, if it did not already exist, a project assessment office that did not have line management responsibility for project execution. As a result, the Under Secretary for Nuclear Security elevated the Office of Project Assessments as a direct report to the Under Secretary, and within the Under Secretary for Management and Performance, the Office of Project Management Oversight and Assessments was established as a direct report to conduct assessments of the EM portfolio of projects. The Under Secretary for Science and Energy uses the successful model employed within the Office of Science (including the comprehensive project reviews conducted by SC's Office of Project Assessment), and is continuing to expand that model to capital projects funded by the energy programs. In June 2015, a Secretarial memorandum further enhanced and clarified departmental policy related to areas of project management to include analysis of alternatives, cost estimating, planning and scheduling, and design management, among others. DOE is in the process of revising its Project Management Order to incorporate these enhancements to DOE's project management processes and procedures.

In addition, the FY 2017 DOE budget proposes to establish a statutory, DOE-wide Office of Cost Estimating and Program Evaluation (CEPE-DOE) in recognition of a gap in DOE's capacity to independently determine accurate costs of programs and acquisitions within DOE. This proposal also complements, but is not duplicative of, NNSA's Office of Cost Estimating and Program Evaluation (CEPE) established by the 2014 National Defense Authorization Act (50 USC 2411). CEPE-DOE will provide independent analytic advice on all aspects of DOE programs, including cost-effectiveness, and the development and evaluation of program alternatives.

Fourth, even with the improved planning tools noted above in place, DOE agrees with the Commission's recommendation that high levels of deferred maintenance and excess facilities continue to pose a challenge. The Commission recommended that DOE work with Congress and OMB to agree upon the size and nature of the resources shortfall for facilities and infrastructure, and to develop a long-term plan to resolve it through a combination of increased funding, policy changes, and innovative financing. DOE agrees with this recommendation, and

will continue briefing Congress and OMB on the updated data on the infrastructure and excess facilities challenges identified by the recent working groups.

Further, current Federal budget statutes and policies derive from the concept of a unified Federal budget and do not provide for separate capital and operating budgets. While DOE will not pursue a capital budget, DOE CFO will work with OMB to establish a separate management information system to report on capital investments that it will present in its FY 2018 budget request to Congress. These efforts will both improve DOE's infrastructure and provide greater public insight into Departmental investments.

DOE also agrees that, where appropriate, innovative financing approaches that are consistent with relevant policies should be pursued more aggressively to address the infrastructure challenges and future needs. DOE has been working with its laboratories to intensify the review and analysis of such approaches, including non-Federal financing and enhanced use leasing, and the LOB receives a monthly update on the progress of these efforts.

Finally, with respect to environmental management technology development, DOE agrees with the recommendations from the recent SEAB Task Force regarding the importance of these initiatives. While EM has made significant progress in closing a number of projects, many of the most challenging projects remain and will for decades to come. To address these challenges, the Secretary established a SEAB Task Force Advisory Board to advise on opportunities and barriers for science and technology development for cleanup, as well as a recommendation on the means to implement a program to develop such technologies. EM is targeting critical, near-term technology challenges, which include the following: disposition of cesium and strontium; remediation of mercury contamination; smarter Solutions for technetium management; developing capability for radioactive test beds; and leveraging Federally-funded initiatives and advancements in robotics. EM also is analyzing its remaining mission scope to identify opportunities for infusing game-changing innovation that will help reduce the overall lifecycle cost and duration of that work. As part of this effort, DOE held a Basic Research Needs workshop (co-sponsored by SC and EM) to identify challenges germane to the clean-up, and SC has now issued a call for proposals seeking new Energy Frontier Research Centers to tackle some of the challenges. EM also will continue to identify technologies that improve upon worker health and safety as well as nuclear facility safety.

## 2.6 ENSURING LASTING CHANGE

The Commission's report points out that over 50 commissions, panels, reviews and studies of the National Laboratories have been conducted over the past four decades, noting that none of



those reports led to the comprehensive change necessary to address persistent challenges. The Commission report observes the lack of a standing body or internal DOE mechanism to advocate for implementation of recommended changes, perform systematic assessments, and evaluate progress over time and states that such an entity could, among other purposes, serve to evaluate whether changes to restore the FFRDC relationship are being made in substance or only cosmetically.

#### **Commission Recommendation**

Under the theme “ensuring lasting change,” the Commission provided the following recommendation:

*Recommendation 36: A standing body should be established to track implementation of the recommendations and actions in this report, and to report regularly on progress, results, and needed corrective actions.*

#### **Discussion**

DOE acknowledges that in the past, certain improvements following recommendations from external bodies have not always been fully implemented or sustained. Recognizing the importance of institutionalizing ongoing and new efforts identified in this response, DOE is committed to tracking implementation of these commitments. Moreover, DOE’s efforts will be guided by the overarching objectives identified in this document, so that DOE can assess not only whether the specific action was taken or not, but also whether it had the intended consequence and effectively addressed the broader goals – a signpost to guide substantive change.

#### **Specific Actions**

For the most part, the actions described in this response are to be owned and implemented by the three Departmental Under Secretaries who have line responsibility for stewardship of the National Laboratories – the Under Secretary for Nuclear Security (LANL, Sandia, and LLNL); the Under Secretary for Science and Energy (the 10 Office of Science labs, NREL, INL, and NETL); and the Under Secretary for Management and Performance (SRNL). That said, monitoring and reporting on these actions will necessarily require cross-agency collaboration. The Secretary will charge the LOB with the responsibility to track implementation of these actions and any other follow-on actions identified to achieve the objectives contained throughout this response. Similarly, the LPC will be charged to serve as a steering committee for the overall effort of re-examining the management framework and partnership for the National Laboratory

system and how it can best serve the public interest. The charters for each group will be modified to reflect these roles and responsibilities. Within the next 24 months, the LOB, working with the LPC, will conduct a review to assess whether the actions articulated here have had their desired impact.

In addition, the DOE Office of Enterprise Assessments (EA) is the organization responsible for performance of assessments on behalf of the Secretary and Deputy Secretary in the areas of nuclear and industrial safety, cyber and physical security, and other critical functions as directed by the Secretary and his Leadership team. EA also has been charged by the Secretary with identifying best practices across the enterprise which will include interfaces with the National Laboratories.

From an independent oversight perspective, DOE believes it would be most efficient to leverage existing bodies to support the implementation of the Commission's recommendations rather than creating a new external committee. DOE also notes that the NLDC indicated in its response to the Commission's report that "we would want to guard against such a body serving as the intermediary between the laboratories, DOE and Congress." DOE plans to look to SEAB. SEAB is a Federal Advisory Committee, composed of external members, which provides advice and recommendations to the Secretary on DOE's basic and applied research, economic and national security policy, educational issues, operational issues, and other activities as directed by the Secretary. SEAB specifically has a Task Force on DOE National Laboratories that was created to provide advice, guidance, and recommendations on important issues related to improving the health and management of the labs. Finally, DOE will include discussion of the implementation of the key objectives and actions in the Annual State of the Laboratory System report described above, tying results back to the desired outcome – a robust, efficient, effective National Laboratory System in service to the Nation.

### **3 CONCLUSION**

The Commission's report identifies strengths of the National Laboratory system and provides recommendations for improvement. DOE is committed to executing the actions identified in this response to strengthen the DOE/laboratory partnership and to nurture and sustain the unique and valuable capabilities of the DOE National Laboratories.

## APPENDIX: FULL SET OF COMMISSION’S RECOMMENDATIONS

Recommendation 1: The National Energy Laboratories provide great value to the Nation in their service to DOE’s mission, the needs of the broader national science and technology community, and the security needs of the Nation as a whole. The Administration and Congress should provide the necessary resources to maintain these critical capabilities and facilities. It would also benefit all stakeholders if the key committees in Congress would develop a more orderly process of reviewing the National Laboratories, to replace the unrelenting pace of studies evaluating the performance of the DOE laboratories. For example, Congress could initiate a comprehensive review of the entire laboratory system in predetermined intervals.

Recommendation 2: Return to the spirit of the FFRDC model (stewardship, accountability, competition, and partnership). DOE and the National Laboratories must work together as partners to restore the ideal nature of the FFRDC relationship as a culture of trust and accountability. DOE should delegate more authority and flexibility to the laboratories on *how* to perform their R&D, and hold them fully accountable for their actions and results. For their part, to be trusted partners and advisors, the laboratories must be transparent with DOE about their planned activities ahead of time, as well as about their actions and results as they are carried out.

Recommendation 3: DOE and each laboratory should cooperatively develop a high level annual operating plan, with specific agreements on the nature and scope of activities at the laboratory, and milestones and goals that are jointly established. Within that framework, DOE should provide increased flexibility and authority to the laboratory to implement that plan. This increased flexibility must go hand-in hand with greater transparency and accountability. The annual operating plan is not intended to be a retrospective evaluation document, such as SC’s Performance and Evaluation and Measurement Plan (PEMP) or NNSA’s Performance Evaluation Plan (PEP). Instead it can provide high-level perspective for such evaluation plans. In other words, as envisioned by the Commission, the annual operating plan fits between the laboratory’s long term strategic plan and its evaluation plan.

Recommendation 4: To improve DOE’s ability to manage the laboratories, DOE should implement greater leadership and management development for its Federal workforce, including multi-directional rotational assignments with the laboratories.

Recommendation 5: DOE should separate NETL’s R&D function from its program responsibilities (and call the R&D portion—not the program activities—NETL). Furthermore, consideration should be given to converting the new, research NETL into a government-owned, contractor-operated FFRDC. Whether or not the above steps are taken, NETL should increase its interactions and collaboration with universities.

Recommendation 6: DOE should abandon *incentive* award fees in the M&O contracts of the National Laboratories in favor of a fixed fee set at competitive rates with risk and necessary investment in mind.

In addition, DOE should adopt a broader and richer set of incentives and consequences to motivate sound laboratory management and enforce accountability.

Recommendation 7: DOE should give the laboratories and M&O contractors the authority to operate with more discretion whenever possible. For non-nuclear, non-high-hazard, unclassified activities, DOE should allow laboratories to use Federal, State, and national standards in place of DOE requirements. DOE should review and minimize approval processes.

Recommendation 8: DOE should modify its processes for developing directives, orders and other requirements to more fully engage subject matter experts for input on the benefits and impacts of the proposed requirements. When developing new requirements, DOE should use a risk-based model, ensuring the level of control over an activity is commensurate with the potential risk.

Recommendation 9: DOE should focus on making the use of CAS more uniform across the laboratories. DOE local overseers should rely on information from the CAS systems, with appropriate validation, as much as possible for their local oversight. The quality of CAS can be increased through peer reviews for implementation and effectiveness.

Recommendation 10: The role of the site office should be emphasized as one of “mission support” to the program offices at DOE and to the laboratories. The site office manager should be clearly responsible for the performance of the site office in support of the mission, and all staff in the site office, including the Contracting Officers, should report to the site office manager. Since site office effectiveness is so dependent on site office leadership, DOE should devote more effort to leadership training and professional development of field staff.

Recommendation 11: DOE should clarify the role and authority of the support centers. Wherever approval authority resides with a support center, DOE should remove it and reinstate it at either the site office or DOE headquarters, as appropriate.

Recommendation 12: All stakeholders should make maximum use of local assessments (performed by site offices and laboratories), with appropriate verification, to reduce duplicative assessments and burden on the laboratories.

Recommendation 13: DOE should establish a single point of control—within the Department or each stewarding program office—for all laboratory-directed data requests.

Recommendation 14: To reduce the number of funding buckets and minimize the accompanying transactional burden, DOE and its program offices should adopt and adhere to the following principles:

- Increase the size of funding increments through consolidation of B&R codes at the highest level possible within each program area.

- Extend timelines and minimize milestones for each increment of funding. Work breakdown structures must be formulated to focus on strategic goals rather than tactical milestones and reporting requirements.
- Within legal limits, institutionalize mechanisms for laboratory flexibility via notification, rather than formal approval, to move money between B&R codes on cross-cutting R&D objectives or closely interrelated research areas among DOE program offices.

Recommendation 15: Congress should repeal Section 301(d) of the FY 2015 Consolidated Appropriations Act as soon as feasible to remedy the transactional burden it creates for OMB, DOE Headquarters, and the laboratories when operating under a continuing resolution.

Recommendation 16: Other DOE program offices should adapt to their contexts the procedures and processes that DOE's Office of Science has in place for guiding and assessing the alignment of the laboratories under its stewardship with DOE's missions and priorities.

Recommendation 17: The processes that the Office of Science has in place for assessing the quality of the research being done by the 10 laboratories under its stewardship, and for assessing the quality of the research portfolio in each of its programs, should be adapted by the other DOE program offices.

Recommendation 18: There must be a government-wide reconsideration of the conference travel restrictions to enable conference participation at levels appropriate to both the professional needs of the existing scientific staff and to attract the highest quality staff in the future. The Commission is encouraged by DOE's recently revised guidance on conference-related activities and spending, and notes that the laboratories have been given more autonomy on this issue, while at the same time being held accountable for the appropriate use of taxpayer funds.

Recommendation 19: The Commission strongly endorses LDRD programs, both now and into the future, and supports restoring the cap on LDRD to 6 percent unburdened, or its equivalent. The Commission recognizes that, in practice, restoring the higher cap will have the largest impact on the LDRD programs of the NNSA laboratories.

Recommendation 20: DOE should manage the National Laboratories as a system having an overarching strategic plan that gives the laboratories the flexibility to pursue new lines of inquiry, so long as the research aligns with mission priorities. Once the research has matured to the point that a preferred or most promising approach can be identified, the Department should provide strategic oversight and guidance, including expert peer review, for the laboratory system to coordinate and potentially consolidate their programs to achieve the most effective and efficient use of resources.

Recommendation 21: Congress should recognize that the technical capabilities currently housed within the NNSA laboratories are essential to the Nation. Maintaining the nuclear explosive package capabilities in separate and independent facilities has proven effective and should continue, thereby

providing senior decision makers the highest possible level of confidence in the country's nuclear weapons stockpile.

Recommendation 22: DOE should establish policies and procedures to make the Strategic Partnership Projects (SPP) process more efficient, especially for work that is consistent with the annual operating plans, such as institutionalizing ongoing efforts to streamline the contracting process through more consistent use of umbrella SPP agreements and oversight mechanisms dedicated to shortening the timeline of the approval process; encouraging greater use of personnel exchanges and "customer relationship managers"; and creating a central point of contact in DOE headquarters to field questions from other Federal agency customers about where specific capabilities lie within the laboratory system.

Recommendation 23: DOE should support efforts to strengthen the Mission Executive Council.

Recommendation 24: DOE and its laboratories should continue to facilitate and encourage engagement with universities through collaborative research and vehicles such as joint faculty appointments and peer review.

Recommendation 25: All DOE programs and laboratories should fully embrace the technology transition mission and continue improving the speed and effectiveness of collaborations with the private sector. Innovative technology transfer and commercialization mechanisms should continue to be pursued and best practices in other sectors, including academia, should be examined.

Recommendation 26: DOE should determine whether the annual operating plans proposed by the Commission in Recommendation 3 could qualify as the "agency approved strategic plan" under the Stevenson-Wydler Technology Innovation Act of 1980, and the Fast-Track CRADA Program, and, if not, Congress should amend the law accordingly. For CRADAs with non-standard terms and conditions, DOE should define the acceptable range for each term and condition to greatly expedite negotiation and review/approval time.

Recommendation 27: Laboratories should pursue innovation-based economic development by partnering with regional universities.

Recommendation 28: DOE, the Administration and Congress should continue to support user facilities at the DOE laboratories. Peer review by relevant external advisory groups should continue to be used to decide which facilities to build and where to put all future upgrades and new and replacement user facilities.

Recommendation 29: DOE should continue implementing the ICR as a consistent method for tracking indirect costs across all laboratories, and encourage additional peer reviews to help mature the ICR as a tool for DOE, the laboratories, and other stakeholders.

Recommendation 30: DOE should provide greater transparency into laboratory indirect costs and publish an annual report of the overhead rates at each National Laboratory.

Recommendation 31: DOE should consider whether a capital budget will better serve its internal facilities and infrastructure budgeting and management needs.

Recommendation 32: DOE and the laboratories should continue efforts to improve laboratory facilities and infrastructure by halting the growth in deferred maintenance and speeding up the deactivation and decommissioning of excess facilities. DOE should work with Congress and OMB to agree upon the size and nature of the resources shortfall for facilities and infrastructure, and to develop a long-term plan to resolve it through a combination of increased funding, policy changes, and innovative financing.

Recommendation 33: DOE, the laboratories, Congress, and OMB should actively work together to identify appropriate situations and methods for utilizing innovative financing approaches, such as third-party financing, enhanced use leases, and other methods, including State funding, gifts, and leveraging partnerships with other Federal agencies.

Recommendation 34: DOE should maintain focus on increasing institutional capability and imposing greater discipline in implementing DOE project guidance, which is currently being incorporated into its DOE directive 413.3 B. Expanding on recent DOE efforts, there should be more peer reviews and “red teams” within DOE, among laboratories, other agencies, industry, and academia when appropriate.

Recommendation 35: The Commission supports the recent SEAB Task Force recommendation to put more resources into science and technology development for the EM program given the technical complexity of its projects.

Recommendation 36: A standing body should be established to track implementation of the recommendations and actions in this report, and to report regularly to DOE, the laboratories, the Administration, and the Congress on progress, results, and needed corrective actions. The standing body could assist congressional committees in developing a rational plan for future evaluations of the DOE laboratories.

**National Laboratory Directors Council  
Executive Committee**  
www.nationalallabs.org • nlhc-chair@nationalallabs.org

Terry Michalske, Chair  
Dan Arvizu  
Bill Goldstein  
Chi-Chang Kao

November 16, 2015

The Honorable Ernest J. Moniz  
Secretary of Energy  
U.S. Department of Energy  
1000 Independence Ave., SW  
Washington, DC 20585

Dear Mr. Secretary,

On behalf of the Department of Energy, National Laboratory Directors Council (NLDC) we respectfully provide the following review of the Final Report of the Commission to Review the Effectiveness of the National Laboratories (CRENEL), "Securing America's Future: Realizing the Potential of the Department of Energy's National Laboratories".

We wish to compliment the CRENEL for the extremely thorough and complete analysis that they performed. We are impressed with the time, effort, and dedication of the CRENEL members to deeply examine each of the 17 laboratories' missions, capabilities, operations, and challenges. We also appreciate the direct access and multiple discussions that the CRENEL Co-Chairs, Jared Cohon and TJ Glauthier provided to the NLDC during the course of their work.

The NLDC is strongly supportive of the overall focus, structure, and recommendations contained in the Final Report. We find that the six themes developed by CRENEL provide useful context to organize and link their thirty-six specific recommendations against the backdrop of the larger strategic objectives. Our review of the CRENEL Final Report addresses each of the six themes, focusing on specific recommendations that we feel are most significant and will require greatest care developing the response. We appreciate the opportunity to work with DOE in preparing detailed responses to each of the CRENEL recommendations, and look forward to working together on implementation.

#### Recognizing Value

This section provided an excellent summary of the importance and unique S&T challenges of the National Laboratories' missions and their critical role in addressing highly complex multi-disciplinary long-term R&D challenges.

While this section contains only one specific recommendation (#1), we view this as extremely important to the development of greater understanding, appreciation, and partnership across Congress, DOE, and National Labs regarding the value of DOE laboratories. We believe that the DOE / NLDC partnership to organize Lab Days has been a valuable step to increase Congress' understanding of and support for the value of the network of DOE laboratories. We support continued opportunities for Congressional

The National Laboratory Directors Council Executive Committee is elected by the members of the Council, including the Lab Directors from Ames, Argonne, Berkeley, Brookhaven, Fermi, Idaho, Jefferson, Livermore, Los Alamos, National Energy Technology, National Renewable Energy, Oak Ridge, Pacific Northwest, Princeton, Sandia, Stanford, and Savannah River National Laboratories.



Members and Staff to see the collective value of the DOE laboratories including events such as Lab Days, Laboratory CODELs, and NLDC meetings with Congressional Committees and their Staff. Continued activities of this type will improve Congress' ability to better understand and assess the value and impact of DOE laboratories.

#### Rebuilding Trust

CRENEL places strong importance on the degree of trust between DOE and its National Laboratories from the point of view of current challenges and its role in underpinning our ability to address future opportunities. This section of the Final Report contains fourteen recommendations, representing nearly forty percent of the total. The NLDC supports the emphasis that CRENEL has placed on this theme. While we would agree that the overall level of trust between DOE and its National Laboratories can and should be improved, we appreciate CRENEL's recognition that the degree of trust varies across DOE programs and that some programs and their laboratories currently enjoy a high degree of trust. We support the focus of the CRENEL recommendations to create a more uniform approach across the DOE.

The NLDC strongly supports Recommendation #2, which emphasizes the need to return to the spirit of the FFRDC. In our view, this recommendation speaks to the core of the partnership and special relationship that must exist between DOE and its National Laboratories. We greatly appreciate the focus and attention that the current DOE leadership has placed on restoring this relationship and we are hopeful that this CRENEL recommendation will serve to guide the DOE / National Laboratory relationship into the future.

The NLDC believes that joint planning between DOE and its National Laboratories is one of the key factors to help build and strengthen that partnership. CRENEL's recommendations #3, #16, and #20 each speak to improvements and increased consistency in the laboratory planning process, pointing toward some of the exemplary practices of DOE's Office of Science. We believe that a process that integrates long-term strategic priorities with annual operating objectives will be most effective. Recommendation #3 calls for the creation of a high-level annual planning document that may help link the laboratory's long-term strategic plan and its annual evaluation plan. While we appreciate the intent of this specific recommendation, we are concerned that a new planning document may become duplicative with current planning documents such as PEMP. We recommend that DOE implement a planning process within each of its elements that links long-term strategy and annual operating needs, taking full advantage of the best practices in DOE's Office of Science and Nuclear Energy organizations.

Recommendation #6 provides a strong encouragement for DOE to abandon incentive award fees in the M&O contracts. The NLDC supports a move away from incentive award fee alone toward a "richer set of incentives and consequences" including extended award duration and increased authority over operations as called out in Recommendation #7 and #8. We suggest that the DOE engage a discussion with laboratory leadership, M&O contractor leadership, and DOE site and program to evaluate how best to support an effective approach to better manage risk and create incentives that encourage the highest level of performance. We note that NNSA has begun such a discussion. We further support Recommendation #9, which calls for the review of the use of CAS, and appreciate the DOE's recent decision to undertake such a review.

Given the importance of developing and sustaining a talented and diverse workforce at the DOE Laboratories, the NLDC suggests that DOE explore opportunities to provide M&O contractors with greater management flexibility aimed at increasing the National Laboratories' ability to attract and retain the current and future generation of workers.

Recommendation #5 pertains to the National Energy Technology Laboratory (NETL), the only DOE laboratory that is government owned and operated. The CRENEL observes that there is a need for “significantly increased clarity and focus on the R&D mission for the research staff at NETL and for others outside NETL who work with them.” The NLDC and specifically the Director of NETL agrees there is a need for increased focus on the R&D conducted by NETL’s scientists. The DOE should explore approaches to better integrate and synchronize NETL’s intramural and extramural research. In addition, the NLDC recognizes the need for more flexibility in NETL’s ability to invest through laboratory-directed research and development (LDRD) or other similar mechanisms.

Finally, the NLDC strongly supports Recommendation #14 calling for a reduction in the number of funding buckets. Such restrictions on the movement of resources act to impede the strategic relationship between DOE and its National Laboratories, creating a more transactional interchange. We understand that moving in this direction will require greater transparency and partnership on the part of the Laboratories. We are encouraged by the recent direction of DOE’s Office of Energy Efficiency and Renewable Energy in this regard.

#### Maintaining Alignment and Quality

We are pleased that CRENEL found there was strong overall mission alignment between DOE programs and the National Laboratories. NLDC supports consistent and effective long-term and annual planning between DOE and its National Laboratories as a means to promote even greater mission alignment going forward. As called out in Recommendation #16, the planning process used by DOE’s Office of Science contains elements that lead to increased mission alignment and could be adapted for use in other DOE mission areas.

The NLDC appreciates CRENEL’s recognition of the important role LDRD plays in the vitality of the National Laboratories, facilitating their ability to “adapt, retool, invest in staff capabilities, and to enter new research areas”. We are pleased to see and fully endorse CRENEL’s Recommendation #19 to restore the cap on LDRD to six percent unburdened, or its equivalent.

The CRENEL’s treatment of the appropriate levels of duplication of research addresses the inherent challenge in balancing competition for new ideas with the need to efficiently focus resources. The NLDC is supportive of recent examples such as the Grid Modernization Initiative and Big Ideas. We agree with CRENEL that these examples represent a step in the right direction. We understand that finding the right balance can be difficult and that there is most certainly not a standard approach that should be applied. It must also be recognized that establishing an efficient focus may require prioritization and partnerships across DOE program areas as well as its National Laboratories. While we agree with Recommendation #20, we would also add the need for DOE and its National Laboratories to partner together early on in the identification of highest priority focus areas for the future.

With regard to Recommendation #21, the NLDC fully endorses the CRENEL’s commitment to maintaining and strengthening the unique competencies at the NNSA laboratories needed to provide the highest level of confidence in our country’s nuclear deterrent.

#### Maximizing Impact

This theme in the CRENEL Final Report focuses on the broader value that the DOE National Laboratories provide through their work with entities outside DOE including other Federal Agencies, academia, and private sector commercial partners through Strategic Partnership Projects (SPP).

Overall, the CRENEL recommends greater strategic engagement between DOE and other Federal Agencies along with a streamlining of the process needed to gain approval for SPP. The NLDC is supportive of Recommendation #22 to create a more coherent interface between DOE, its National Laboratories, and other Federal Agencies. However, in responding to this recommendation we strongly caution DOE against creating a “gate keeper” function that could add additional steps and further complicate SPP.

CRENEL recognizes the high level of collaboration that exists between DOE Laboratories and universities. However, partnering with industry and transitioning technology is specifically called out in Recommendations #25 and #26 as an area where improvement is needed. While we agree with the assessment of barriers and the intent of these recommendations, we believe more is necessary to guide improvement. Recommendation #25 is not sufficiently specific to address the inconsistency among labs or program offices. Recommendation #26 is helpful, but more is needed to drive major improvement. In order for technology transfer to be a priority, each program office must clearly articulate that priority, resource it directly, and hold laboratories accountable to improve their performance.

NLDC appreciates CRENEL’s call for continued support for user facilities at the DOE Laboratories (Recommendation #28).

#### Managing Effectiveness and Efficiency

As CRENEL points out, the DOE Laboratories are often criticized for being too expensive. We appreciate CRENEL’s recognition that laboratory leadership is extremely mindful and proactive in controlling overhead rates. The CRENEL analysis shows non-NNSA laboratory overhead rates are comparable with top-funded R1 universities. The higher cost of NNSA laboratories is an understandable outcome of their nuclear and classified missions. NLDC supports continued transparency (Recommendation #29) across major sectors of the National Laboratory population.

The NLDC agrees with CRENEL that better management of DOE Laboratories’ collective facilities and infrastructure is necessary. We also support recent steps taken by DOE to accurately assess the scope of deferred maintenance and associated budget shortfall. We strongly support Recommendations #32 and #33 to continue efforts to work with Congress and OMB to better understand the magnitude of the problem, develop a prioritized plan of action, and utilize the full spectrum of approaches including increased funding, policy changes and innovative financing to address the shortfall.

In many cases, large-scale projects in NNSA and EM represent one-of-a-kind programs and facilities. We agree with CRENEL Recommendation #34 to expand recent DOE efforts to place more emphasis on peer review and “red teams” to help assess risk and identify alternatives. In addition, the EM program faces significant technical challenges as it addresses the remaining, more challenging work ahead. As CRENEL points out in Recommendation #35, better scientific and technical basis will be needed to successfully address the complex problems ahead.

#### Ensuring Lasting Change

Perhaps the most challenging recommendation from the CRENEL Final Report is the call for a standing body to track implementation and actions in the CRENEL Report with the intent to minimize the need for new congressional commissions (Recommendation #36). The NLDC agrees with the intent of the recommendation and understands the tradeoffs regarding where such a body would be charged and housed. It is not clear to us that there is a “perfect” place for such a standing body. However, we would

want to guard against such a body serving as the intermediary between the laboratories, DOE and Congress. It is the view of NLDC that open, frequent, and strategic communications between the DOE, NLDC, and Congress are the best means to ensure the greater understanding that will promote lasting change in how our country best utilizes the enormous resource that is contained in the DOE Laboratories.

It is our hope that this brief review of the CRENEL recommendations provides value to you and to the DOE. We stand ready to fully support the DOE in its development of detailed response to each of the CRENEL's recommendations. Thank you for the opportunity to provide our input on the CRENEL Final Report.

Sincerely,

A handwritten signature in black ink, appearing to read 'T. Michalske', with a long horizontal flourish extending to the right.

Dr. Terry A. Michalske  
Chair, National Laboratory Directors Council  
Director, Savannah River National Laboratory

## SECRETARY OF ENERGY ADVISORY BOARD

MEMORANDUM FOR: SECRETARY OF ENERGY

FROM: Secretary of Energy Advisory Board (SEAB)

DATE: January 26, 2016

SUBJECT: Task Force comments on the *Final Report of the Commission to Review the Effectiveness of the National Energy Laboratories*

You have charged the SEAB National Laboratory Task Force to review studies of the DOE National Laboratories as they appear and to give you advice about what your response should be to their findings and recommendations. This SEAB letter transmits the comments of its National Laboratories Task Force on the recently released report of the Commission to Review the Effectiveness of the National Energy Laboratories (CRENEL), entitled *Securing America's Future: Realizing the Potential of the DOE's National Laboratories*. That committee, co-chaired by TJ Glauthier and Jared Cohen, was formed pursuant to Section 319 of the Consolidated Appropriations Act, 2014 (Public Law No. 113-76), and was charged to evaluate the laboratories'

“...alignment with the Department’s strategic priorities, duplication, ability to meet current and future energy and national security challenges, size, and support of other Federal agencies,...the efficiency and effectiveness of the laboratories, including assessing overhead costs and the impact of DOE’s oversight and management approach,...the effectiveness of the Department’s oversight approach and the extent to which LDRD funding supports recruiting and retention of qualified staff<sup>1</sup>.”

The CRENEL report is based on extensive fact finding, including significant testimony from numerous stakeholders and visits to all of the labs in the DOE complex. The final report, issued on October 28, 2015, follows the Commission’s report of February 27, 2015, and contains a total of 36 recommendations across 6 primary themes: recognizing value,

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<sup>1</sup> *Final Report of the Commission to Review the Effectiveness of the National Energy Laboratories*, Volume 1, October 28, 2015, p 1.

rebuilding trust, maintaining alignment and quality, maximizing impact, managing effectiveness and efficiency, and ensuring lasting change. For convenience, Appendix 1 of this letter provides a copy of the tabulated recommendations from the Commission's report, grouped by theme and identifying a proposed owner for each.<sup>2</sup>

Overall, our SEAB Task Force endorses the CRENEL report. We find the analysis and recommendations from the Commission to be consistent with the numerous prior investigations, commissions and studies that have reviewed the Laboratories over the years. The Commission's report is well aligned in areas that overlap with previous work and recommendations from our Task Force. We comment below on several specific items but, in general, we view the Commission's report as a thorough recitation of a well-told story that repeats and reinforces important recommendations to improve the efficiency of laboratory operations, planning and research outcomes, while endorsing the value, the direction and operations of the current laboratory system. As with the majority of recent reports, the Commission decries the current environment where oversight and regulation are increasingly imposed on the national laboratories and Congress and the Department have not followed-up or implemented recommendations to streamline the process and the management of the labs. Speaking to this issue, the Commission's final recommendation states,

A standing body should be established to track implementation of the recommendations and actions in this report, and to report regularly to DOE, the laboratories, the Administration, and the Congress on progress, results, and needed corrective actions. The standing body could assist Congressional committees in developing a rational plan for future evaluations of the DOE laboratories.<sup>3</sup>

Later in this letter, you will find SEAB's recommendation on how the "standing body" could be created and who should establish and maintain it.

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<sup>2</sup> The Commission appendix would be even more useful if the Commission suggested which office in DOE should be the "responsible actor" for each recommendation. Experience shows that absent direct secretarial intervention, bureaucratic interests greatly delay the implementation of meritorious proposals for change.

<sup>3</sup> *ibid*, p 63.

We first point out areas of emphasis in the Commission's report that reinforce points raised in your SEAB Task Force's report:

1. The Commission speaks to the need to reestablish the model in which the laboratories operate as FFRDCs and roles are appropriately established: "...the government is responsible for setting the "*what*" of strategic and program direction to meet the Nation's needs, while the contracted partners, along with the laboratories they manage and operate, are responsible for determining precisely "*how*" to meet the technical and scientific challenges and to carry out programs."<sup>4</sup> In particular, the Commission highlights the need to clearly establish where responsibility rests amongst the many stakeholders involved in the lab management and delivery system (the laboratory director and the director's leadership team, DOE Headquarters sponsoring program offices, DOE Site (or in the case of the NNSA, Field) Offices, DOE Service Centers, DOE operational oversight offices, the M&O contractor). This finding is directly aligned with the primary focus in our Task Force's report (Recommendation 1.1) to use the Laboratory Policy Council to clarify the roles and responsibilities for mission execution at the laboratories and direct the Under Secretary for Management and Performance to lead the Laboratory Operations Board in implementing these changes.
  
2. The Commission's report recommends a number of actions that can be taken to provide immediate change to the overly burdensome detailed management of the laboratories that is inconsistent with the philosophy of a Government Owned, Contractor Operated (GOCO) laboratory. The Commission endorses the recommendation of the Augustine-Mies Panel to eliminate the incentive portion of the M&O contract award, replacing it with a competitive fixed fee arrangement. We support this recommendation as a way to reduce complex bureaucracy, which is delivering limited operational performance leverage.

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<sup>4</sup> *ibid*, p iv.

Other short term actions recommended in the CRENEL report are consistent with the SEAB Task Force's recommendation for laboratory management "experiments." The Commission suggests reestablishing local and rapid decision making for conference participation (which it deems vital to maintaining the intellectual excellence of laboratory staff), establishing a single point of control within the Department for all laboratory data requests, and removing approval authority from Support Centers, clearly articulating their *support* role.

Finally, it is worth noting that the Commission specifically recommends separating the National Energy Technology Laboratory (NETL), currently the only Government Owned, Government Operated (GOGO) laboratory in the system, into two independent parts -- a standard GOCO to handle the research and development mission and a contracting office to handle the disbursement of funds to external partners.

We find merit in all these CRENEL suggestions.

3. As noted in numerous reviews and reports over the last decade, the Commission observes that the laboratories can make a greater contribution to the national economy and its competitiveness, if the laboratories have effective technology transfer processes in place. The Commission clearly articulates the larger view of what technology transfer means, commenting that in addition to traditional Cooperative Research and Development Agreements, Work for Others, or licensing activities, significant technology transfer occurs through the world class user facilities, through the maturing of early career research talent and through personnel flow and rotation between the laboratories, academia and industry. SEAB strongly endorses this view. However, we believe that CRENEL has failed to comment on an important issue on this topic. As the Interim Report by the SEAB National Laboratory Task Force suggests, there is some level of confusion and inconsistency about whether economic development and national competitiveness are part of the mission of National Laboratories. To address this directly, the SEAB report has recommended (#3.1) that you issue a policy statement that



creating value for the private sector through the use of technology transfer, research facilities and workforce is part of the National Laboratory mission. We continue to advocate this.

4. The Commission provides a thorough analysis of the rationale and current uses of Laboratory Directed Research and Development (LDRD) and finds clear benefits from the program for supporting high-risk, potentially high reward early-stage research, for exploring research avenues that may be new to the laboratory or the complex, and as a significant tool that “.. enables laboratories to develop and invest in its workforce for both the short and long term.”<sup>5</sup> As with numerous recent reviews, including your Task Force, the Commission “...strongly endorses LDRD programs, both now and into the future, and supports restoring the cap on LDRD to 6 percent, unburdened, or its equivalent.”<sup>6</sup>
5. The Commission notes positively your strongly articulated commitment and the steps being taken by the Department to ensure alignment of the laboratories in its strategic planning processes. The Office of Science (SC) process is described in detail:

During this Laboratory Strategic Planning process, SC requires laboratory leaders to define the long-range visions for their respective laboratories. This information provides a starting point for discussion about each laboratory’s future directions, immediate and long-range challenges, and resource needs. DOE and the laboratory leaders settle on new research directions and the expected development or sustainment of capabilities. In addition, external advisory committees provide advice on establishing research and facilities priorities; determining proper program balance among disciplines; and identifying opportunities for inter-laboratory collaboration, program integration, and industrial participation.<sup>7</sup>

The report further describes the effective processes SC uses to review its alignment to DOE strategy and connect both its strategic and tactical execution to its annual

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<sup>5</sup> *ibid*, p 66.

<sup>6</sup> *ibid*, p 43. SEAB notes with some sadness that use of the word “equivalent” apparently conceals inability to agree on a simple and transparent method to calculate the 6% because some labs are jockeying for more complex formulae that result in greater LDRD.

<sup>7</sup> *ibid*, p 35.

Performance and Evaluation and Measurement Plan (PEMP.) The Commission calls for the adaptation of these core, successful processes to all the DOE laboratories. As you know, the SEAB Task Force made a similar recommendation and proposed that the DOE Laboratory Operations Board be charged with the task of implementing a DOE-wide effort to identify, manage, and resolve issues affecting the management, operations, and administration of the National Laboratories.

One additional point that bears mentioning is the Commission's analysis and endorsement of recommendations made by both the NRC<sup>8</sup> and, more recently SEAB<sup>9</sup>, to provide a modest investment stream for science and technology development for the Environmental Management program, stating that, "Success of the cleanup effort will require significant new understanding of the science and with this understanding, development of new technology."<sup>10</sup>

As noted above, CRENEL calls for the establishment of a "standing body" to track implementation of the recommendations made in its report. SEAB recommends that because most of the National Laboratories are managed by their respective offices of the Under Secretaries for Science & Energy and Nuclear Security, and many of the recommendations involve management and performance, the "standing body" should be formed by the three Under Secretaries – Science & Energy, Nuclear Security and Management & Performance – with the Under Secretary for Management & Performance serving as the Chair of this standing body. The purpose of this standing body would be to track and enforce timelines and priorities to make process changes and report directly to the Secretary.

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<sup>8</sup> National Research Council, Committee to Evaluate the Science, Engineering, and Health Basis of the DOE's Environmental Management Program, *Improving the Environment: An Evaluation of DOE's Environmental Management Program*, (Washington DC: NRC, 1995), 21.

<sup>9</sup> SEAB, *Report of the Task Force on Technology Development for Environmental Management*, (Washington, DC: DOE, 2014);

<sup>10</sup> *Final Report of the Commission to Review the Effectiveness of the National Energy Laboratories*, Volume 1, October 28, 2015, p 59.

We also note a few points where we feel that the CRENEL report could have been a bit more assertive in its recommendations.

1. The Congressional charge to the Commission implicitly calls for a judgment about whether the size of the DOE national laboratory network is too big, too small, or just right given the current and future technology needs of the country in DOE's mission areas of responsibility: science, energy, national security, and environmental management. The Commission does not directly address this central question but their implicit answer is that the DOE national labs are doing their job, their effectiveness and efficiency is impaired by over regulation, and the amount of public resources is "just right" although at several points there is a hint that more resources would be welcome. This central conclusion would be more convincing if the Commission had examined a range of different organizational arrangements, quite different from the current structure, and compared the pros and cons of each.
2. The CRENEL report also does not offer a timeline for its recommendations to be implemented. Because many of the recommendations are similar to the ones offered by the SEAB Task Force, we suggest that you use the timeline offered by the SEAB Task Force report.

In summary, we find that the CRENEL Commission report provides additional support for the numerous findings and recommendations that have already been voiced about the value and performance of the DOE national laboratories. The Commission also repeats and underscores the many recommendations that have been made to streamline the management and oversight of the laboratories, thus making them more efficient and of greater value to the scientific and technological strength of the country. It is up to you and your successors to see that the meritorious suggestions for change are put into place.



# Appendix 1 Summary of the Commission's Recommendation<sup>11</sup>

Section	Theme	Section	Theme
2	Recognizing Value	5	Maximizing Impact
3	Rebuilding Trust	6	Managing Effectiveness and Efficiency
4	Maintaining Alignment and Quality	7	Ensuring Lasting Change

Table 4. Responsible Actors for Each Recommendation and Cross-References to Volume 2

Volume 1 Chapter & Section Reference	Rec. No.	Recommended Action	Responsible Actor(s)	Volume 2 Chapter & Section Reference
2.C	1	The Administration and Congress should recognize the value of the National Laboratories and provide the necessary resources to maintain their capabilities and facilities. Congress should also develop a more orderly process of reviewing the laboratories.	Administration and Congress	1.E
3.A.1	2	Department of Energy (DOE) and the laboratories must work together to restore the Ideal Federally Funded Research and Development Center (FFRDC) relationship as one of trust and accountability. DOE should delegate more authority and flexibility to the laboratories and hold them accountable. The laboratories must be more transparent with DOE about their activities.	DOE and Laboratories	2.C
3.A.1	3	DOE and each laboratory should jointly develop an annual operating plan, with agreements on the nature and scope of the laboratory's activities, including goals and milestones. DOE should then provide increased flexibility and authority to the laboratory to implement that plan.	DOE and Laboratories	2.C
3.A.1	4	To improve DOE's ability to manage the laboratories, DOE should implement greater leadership and management development for its Federal workforce, including multi-directional rotational assignments.	DOE	2.C
3.A.1	5	DOE should separate the National Energy Technology Laboratory's (NETL) research and development (R&D) function from its program responsibilities. Consideration should be given to converting the new research NETL into an FFRDC. NETL should increase its interactions with universities.	DOE and Congress	2.C
3.A.2	6	DOE should abandon incentive award fees in favor of a fixed fee set at competitive rates with risk and necessary investment in mind. DOE should also adopt richer set of incentives to motivate sound management.	DOE	2.C

<sup>11</sup> Reproduced directly from Table 4 of the *Final Report of the Commission to Review the Effectiveness of the National Energy Laboratories*, Volume 1, October 28, 2015.

Volume 1 Chapter & Section Reference	Rec. No.	Recommended Action	Responsible Actor(s)	Volume 2 Chapter & Section Reference
3.B.1	7	DOE should give the laboratories the authority to operate with more discretion whenever possible. For non-nuclear, non-high-hazard, unclassified activities, DOE should allow laboratories to use Federal, State, and national standards in place of DOE requirements. DOE should review and minimize approval processes.	DOE	3.G
3.B.1	8	DOE should modify its processes for developing directives, codes and other requirements to get more input on the benefits and impacts of the proposed requirements. When developing new requirements, DOE should use a risk-based model, ensuring the level of control over an activity is commensurate with the potential risk.	DOE	3.G
3.B.2	9	DOE should focus on making the use of Contractor Assurance System (CAS) more uniform across the laboratories. DOE local overseers should rely on information from the CAS systems, with appropriate validation, as much as possible for their local oversight. The quality of CAS can be increased through peer reviews for implementation and effectiveness.	DOE	4.D
3.B.2	10	The role of the site office should be emphasized as one of "mission support." The site office manager should be responsible for the performance of the site office, all staff, including the Contracting Officers, should report to the site office manager. DOE should devote more effort to professional development of field staff.	DOE	4.D
3.B.2	11	DOE should clarify the role and authority of the support centers. Wherever approval authority resides with a support center, DOE should remove it and reinstate it at the site office or DOE headquarters.	DOE and External Auditors	5.C
3.B.3	12	All stakeholders should make maximum use of local assessments (performed by site offices and laboratories), with appropriate verification, to reduce duplicative assessments and burden on the laboratories.	DOE	5.C
3.B.3	13	DOE should establish a single point of contact within the Department for all laboratory-directed data requests.	DOE	6.D
3.B.4	14	DOE should increase the size of funding increments by consolidating budget and reporting (B&R) codes, extending timelines and minimizing milestones for each funding increment and institutionalizing mechanisms to move money between B&R codes for related research areas.	DOE	6.D
3.B.4	15	Congress should repeal Section 301(d) of the FY 2014 Consolidated Appropriations Act as soon as feasible to remedy the transactional burden it creates for the Office of Management and Budget (OMB), DOE Headquarters, and the laboratories.	Congress	6.D
4.A	16	Other DOE program offices should adapt the processes that DOE's Office of Science has in place for guiding and assessing the alignment of the laboratories under its stewardship with DOE's missions and priorities.	DOE	7.E
4.B	17	The processes that Office of Science has in place for assessing the quality of the research being done by its laboratories and for assessing the quality of its research portfolio should be adapted by the other program offices.	DOE	7.E
4.B	18	There must be reconsideration of the travel restrictions to enable conference participation at levels appropriate to the professional needs of the laboratory scientific staff and to attract the highest quality staff in the future. The Commission is encouraged by DOE's recently revised guidance on conference-related activities and spending.	DOE and OMB	7.E
4.C	19	The Commission strongly endorses Laboratory Directed Research and Development (LDRD) programs, both now and into the future, and supports restoring the cap on LDRD to 6 percent unencumbered, or its equivalent. DOE should ensure that the LDRD programs have the largest impact on the LDRD programs of the National Nuclear Security Administration laboratories.	Congress	8.D
4.D	20	DOE should manage its laboratories as a system having an overarching strategic plan that gives the laboratories the flexibility to pursue new lines of inquiry. Once the research has sufficiently matured, DOE should provide strategic oversight and guidance to coordinate and potentially consolidate their programs.	DOE	7.E

Volume 1 Chapter & Section Reference	Rec. No.	Recommended Action	Responsible Actor(s)	Volume 2 Chapter & Section Reference
4.D	21	Congress should recognize that the capabilities currently housed within the ANSLA laboratories are essential to the Nation. Maintaining these capabilities in separate and independent facilities should continue.	Congress	7.E
5.A	22	DOE should establish techniques to make the Strategic Partnership Projects process more efficient.	DOE	9.E
5.A	23	DOE should support efforts to strengthen the Mission Executive Council.	DOE	9.E
5.B	24	DOE and its laboratories should continue to facilitate and encourage engagement with universities through collaborative research and vehicles such as joint faculty appointments and peer review.	DOE and Laboratories	10.C
5.C	25	DOE and the laboratories should fully embrace the technology transition mission and continue improving the speed and effectiveness of collaborations with the private sector, innovative transfer and commercialization mechanisms should be pursued and best practices in other sectors should be examined.	DOE and Laboratories	11.E
5.C	26	DOE should determine whether the annual operating plans proposed by the Commission could qualify as the peer review process for the Fast Track Cooperative Research and Development Agreement Program. If not, Congress should amend the law accordingly.	DOE and Congress	11.E
5.C	27	Laboratories should pursue innovation-based economic development by partnering with regional universities.	Laboratories	11.E
5.D	28	DOE and Congress should continue to support user facilities at the DOE laboratories. External advisory groups should continue to be used to decide which facilities to build and how to upgrade existing facilities.	DOE, Administration, and Congress	12.C
6.A	29	DOE should continue implementing the Institutional Cost Report (ICR) as a method for tracking indirect costs and the laboratories should continue peer reviews to help measure the ICR as a tool for DOE, the laboratories, and other stakeholders.	DOE	13.E
6.A	30	DOE should provide greater transparency into laboratory indirect costs and publish an annual report of the overhead rates at each individual National Laboratory.	DOE	13.E
6.B	31	DOE should consider whether a capital budget will better serve its internal facilities and infrastructure budgeting and management needs.	DOE	14.D
6.B	32	DOE and the laboratories should continue efforts to improve facilities and infrastructure by halting the growth in deferred maintenance and speeding up the deactivation and decommissioning of excess facilities. DOE should work with Congress and OMB to agree upon the size and nature of the resources shortfall for facilities and infrastructure, and to develop a long-term plan to resolve it through a combination of increased funding, policy changes, and innovative financing.	DOE, Laboratories, Congress, and OMB	14.D
6.B	33	DOE, the laboratories, Congress, and OMB should actively work together to identify appropriate situations and methods for utilizing innovative financing approaches, such as third-party financing, private-public partnerships, and other methods, including State funding, gifts, and leveraging partnerships with other Federal agencies.	DOE, Laboratories, Congress, and OMB	14.D
6.C	34	DOE should maintain focus on increasing institutional capability and imposing greater discipline in implementing DOE project guidance, which is currently being incorporated into its DOE directive 413.3 b. There should be more peer reviews and red teams within DOE.	DOE	15.G
6.C	35	The Commission supports the recent Secretary of Energy Advisory Board Task Force recommendation to put more resources into science and technology development for the EM program given the technical complexity of its projects.	DOE, Administration, and Congress	15.G
7.C	36	A standing body should be established to track implementation of the recommendations and actions in this report, and to report regularly to DOE, the laboratories, the Administration, and the Congress. This body could assist Congress in developing a rational plan for future evaluations of the DOE laboratories.	DOE, Administration, and Congress	16.D

RECOMMENDATIONS OF THE COMMISSION TO REVIEW THE EFFECTIVENESS  
OF THE NATIONAL ENERGY LABORATORIES

Written Testimony of

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**Submitted to the**

U.S. House of Representatives  
Committee on Science, Space, and Technology  
Subcommittee on Energy  
November 18, 2015

**Recommendations of the Commission to Review the Effectiveness of the National Energy Laboratories**

Testimony reflects the personal views of witnesses



**Written Testimony Submitted to**

Subcommittee on Energy  
Committee on Science, Space, and Technology  
U.S. House of Representatives

**Recommendations of the Commission to Review the Effectiveness of the National Energy Laboratories**

November 18, 2015

**Professor Venkatesh Narayanamurti**  
**Professor Laura Diaz Anadon**  
**Professor Gabriel Chan**  
**Dr. Amitai Y. Bin-Nun**

Dear Chairman Weber, Ranking Member Grayson, and distinguished Members of this Subcommittee,

Thank you for the opportunity to submit a written statement to this committee which, led by the efforts of Representatives Hultgren and Perlmutter, continues to actively engage on issues of National Laboratory policy. Not only is this topic critical to the national interest, but it is of particular professional and personal significance to me.

My name is Venkatesh Narayanamurti. I am currently the Benjamin Peirce Research Professor of Technology and Public Policy and Research Professor of Physics at Harvard University. I was formerly the Dean of the Harvard John A. Paulson School of Engineering and Applied Sciences and Dean of Physical Sciences at Harvard.

Previously, I served as the head of the Semiconductor Electronics Research Department and then as Director of the Solid State Electronics Research Laboratory at AT&T's Bell Laboratories. From 1987 to 1992, I was Vice President of Research at Sandia National Laboratories.

It was in these roles that I came to understand some of the key principles that underlie this statement. Namely, that innovation is fostered when control over the research agenda resides as close as possible to the researchers in the lab. Management should support the judgment of scientists to the greatest extent possible. Additionally, it has become very clear to me that the traditional "linear model" of innovation that bifurcates research into "basic" and "applied" varieties hinders innovation.

My testimony stems from research I led as the Co-Principal Investigator of the Energy Technology Innovation Project (ETIP) at the Harvard Kennedy School (HKS) with Professor Laura Diaz Anadon (also at HKS). Our group has led research on supporting decisions about the optimal levels of DOE R&D investments in various energy technologies considering technology uncertainty, the structure and management of research institutions, and the linkage between DOE and the private sector. As part of the research at HKS in energy innovation over the past 7 years, together with Prof. Gabriel Chan and Dr. Amitai Bin-Nun, we have investigated management issues at the National Labs in detail. We have a manuscript under consideration on this topic at an academic journal and will soon be releasing a report containing our findings. This testimony outlines some of our most important findings and recommendations.

I would also like to thank TJ Glauthier and Jared Cohon for their service to the nation in leading the Commission to Review the Effectiveness of the National Energy Laboratories (CRENEL). Their report has done an excellent job of highlighting the vital role of the Labs and has captured the importance of shifting

investment controls from DOE, where much of current authority currently lies, to scientific management at the Labs.

What follows is the testimony of my own experience, research, and personal views and that of my colleagues Prof. Laura Diaz Anadon, Prof. Gabriel Chan, and Dr. Amitai Bin-Nun. Our research contrasts with that of CRENEL in that we specifically focus on DOE's energy transformation mission. While the DOE's nuclear security, environmental management, and fundamental science missions are also worthy of independent study, we feel that focusing on one particular mission and integrating academic scholarship brings forth recommendations additional to those in CRENEL, which we largely support. We are also able to bring to bear our collective decades of research experience in the process of energy technology innovation and innovation systems and policy, a perspective that has been missing from the debate around the future of the National Labs. In this way, our testimony complements the CRENEL report by extending some of their recommendations as well as offering several new ideas and perspectives.

#### 1. A Holistic View of the National Lab System

We would like to briefly address the question of whether the size of the Lab system is appropriate for its energy technology mission. This mission is crucial for the long-term fortune of our nation; energy innovation has the potential to reduce national expenditures on energy and related trade deficits, reduce the threat and impact of climate change, and contribute to economic growth and national security through the development of new technologies.

The Federal Government has many tools at its disposal to advance energy technology innovation. It can signal markets, for example, through energy tax and regulatory policy ("market pull"), and it can advance research, development, and deployment of energy technologies ("technology push"). Both of these kinds of tools can be effective, but the most effective policy portfolio balances a combination of these policies.

According to the Congressional Research Service, federal tax-related support for the energy sector was \$23.3 billion in 2013. For the same year, our group at Harvard calculated that DOE invested \$5.3 billion in energy technology research, development and demonstration. DOE's R&D investments are key to achieving the nation's long-term goals of reducing carbon emissions, enhancing energy security, and growing the U.S. economy, but our research finds that current levels of federal energy R&D support are insufficient to reach those goals. We argue that greater investment in energy R&D through the Labs and other programs could help meet long-term national energy goals. Further, variability and unpredictability in DOE energy research budgets from year to year erode the effectiveness of federal R&D investments and should be minimized to the greatest extent possible. Reducing volatility in funding could be achieved by following a multi-year high-level strategy, along the lines of those suggested by the recent Quadrennial Technology Review. This does not mean that programs should continue indefinitely in the name of stability: it should be possible to cut non-performing programs after careful deliberation as new information becomes available, as is currently the norm in agencies such as ARPA-E.

**We recommend expanding Federal investment in energy R&D through a gradual increase in funds targeted to technology areas through a process informed by external experts and guided by a long-term focus on energy system transformation.**

The National Labs serve as a key anchor in the national innovation system with their \$14 billion budget (which covers several missions, including advancing fundamental science, stewarding the nuclear stockpile, and energy innovation), 50,000+ staff, and 17 Labs. Structurally, the Labs are unique in that federal ownership can insulate the R&D mission of the Labs from the short-term pressures faced by R&D organizations in the private sector. Industrial R&D, shaped by short-term pressures, is heavily focused on creating commercializable inventions, whereas the Labs can have a longer horizon.

Reforming key areas of National Lab operations and interaction with DOE is necessary to improve the capability of the Labs to deliver on DOE's energy innovation mission. However, reforms should be mindful of protecting the unique role that the Labs play in the national innovation system.

**We recommend that the outcome of any reform process should preserve the current high-level framework for Lab management, including DOE stewardship and the government-owned, contractor-operated (GOCO) model.**

## 2. Role of private sector engagement

Contemporary research into technological innovation has moved past the once dominant "linear model" of innovation, in which basic research is thought to lead to applied research, which in turn creates opportunities for new invention. Contemporary research into technological innovation favors a "connected R&D" model, where innovation is not separated into "basic" and "applied" activities, but rather is one continuous activity-space, where activities normally classified as "applied" and "basic" are mutually reinforcing and chronologically sequenced in a variety of ways. This connected model emphasizes the knowledge feedback that develops when technologies are put into practical application. Under this new paradigm, new inventions in the domain of Engineering enable deeper understanding in the domain of Science with a comparable frequency to the reverse direction of influence.

In our view, the boundary between "basic" and "applied" research is usually arbitrary and counterproductive to research management. For this reason, the Labs' ability to innovate is likely degraded by the "stovepiping" of basic and applied research funding streams separately administered by the Office of Science and the "applied energy" offices. Congress should encourage DOE to support energy research efforts that engage a broad scope of innovation-related activities (e.g., exploration, device design, simulations, etc.) without regard to whether the project is at an "applied energy" or "science" Lab. This requires seamless integration of the basic and applied research funding streams aimed at energy innovation.

**We strongly support the appointment of a single Under Secretary for Energy and Science. Congress should make this position permanent.**

One manifestation of the linear model view has been an effort to focus greater government involvement in the research enterprise on "basic" research activities, with the idea that the private sector is better positioned to pick up at the "applied" stage or that Lab activities in "basic" research should be kept separate from more "applied" projects. However, this separation of activities across institutions into basic and applied research have led to "siloes" where there should instead be greater integration. In the context of the Labs, this has resulted in an important disconnect between the Labs and the private sector. Some view this as intentional element of the Lab system resulting from the linear model view. Instead, we view engagement between the Labs and the ultimate users of technology as an essential component of DOE's mission of transforming the nation's energy system. As an example, DARPA has applied the "connected R&D" model and has benefited from interacting with the users of its technology output.

In the energy context, the private sector holds the majority of the nation's energy infrastructure and conducts the majority of R&D, as is the case for many non-defense technology areas. Therefore transforming the energy system implies that the Labs must support the private acquisition of technology alternatives developed by the Labs. We find it difficult to imagine how this acquisition from the public Labs to the private sector can be accomplished without the Labs closely working with private firms in some capacity. In fact, correctly done, engagement with the private sector is also beneficial in advancing the fundamental science mission of the Labs. The connected R&D model implies that both the Labs and private firms have much to gain from the cross-fertilization of their "invention" and "discovery" activities.

Accordingly, Congress has charged the Labs with a technology transfer mission. This mission does not imply that Labs should conduct R&D that exclusively meets private sector needs. Labs should work to meet government missions, but when those missions have direct implications for private sector activity, Labs should embrace private sector engagement to the extent necessary to cost-effectively fulfill those government missions.

Our research indicates that since 1997, there has been a consistent downward trend in the technology transfer metrics used by DOE to assess Lab-private sector engagement. Our view is that the Labs are responding to mixed policy messages from DOE and Congress. Reduced engagement with the private sector represents not just missed opportunities to advance the mission the Labs have been charged with, but it also degrades the ability of the Labs to spur technological innovation. In fact, our research demonstrates that technology licenses that transfer technologies from the Labs to the private sector result in significantly increased follow-on innovation in private firms, acting as an impact-multiplier for federal R&D funds and for private R&D.

**DOE should design technology licensing agreements and collaborative R&D agreements to best leverage DOE funding into follow-on innovation in the private sector.**

### 3. Laboratory-directed Research and Development (LDRD)

We recognize that the appropriate utilization of Laboratory-directed research and development (LDRD) has been addressed by Congress in the recent past. We understand the need to balance the positive impacts of LDRD on Lab culture with the need for Labs to fulfill their core mission efficiently and with proper federal oversight. In our studies of the Lab system, however, we have uncovered new information that should inform Congressional perspectives on LDRD.

LDRD is often seen as a personnel recruitment and retention tool, particularly at the NNSA Labs. Indeed, delivering on the Labs' missions is dependent on the retention of quality scientific personnel. However, our studies of measurable innovation output from the Labs find that LDRD plays a key role in driving new patent filings and invention disclosures at the Labs. From 2007-2012, DOE disclosed a new invention for approximately every \$5 million in R&D invested at the Labs. Yet, for Lab investment allocated under LDRD, inventions were reported at nearly four times this rate. Similarly, on a dollar to dollar basis, more than two times as many patents resulted from LDRD relative to the broader pool of DOE funding. While a number of assumptions are embedded in our calculations, these results show that, on average, LDRD funds result in a greater rate of new inventions and patents than DOE-allocated funds. Congress should assist DOE in moving towards a view that holds LDRD as a key part of the Lab innovation portfolio.

This finding parallels the increasing recognition of the power of "bottom-up" innovation, which supports using ideas stemming directly from researchers to complement a research agenda driven by centralized management. Some private firms have created programs that solicit input from researchers and employees at the front lines of innovation, often dedicating considerable funds and/or personnel time to these ideas.

We argue that LDRD should be seen as the National Lab equivalent of these private sector programs. In our view, LDRD funds are not a diversion from the Labs' core mission, but an integral element of the Labs' research portfolio and a way to more effectively capitalize on the investment the Labs have already made in attracting some of the world's best scientific talent to the National Labs.

**We recommend that approval for LDRD projects should be limited to Lab directorates without need for prior approval by DOE Site Offices, a recommendation also suggested by CRENEL as a pilot initiative.**

**Congress should also encourage the increased utilization of LDRD at the Labs with an energy mission to reach the existing statutory limits.**

STATEMENT SUBMITTED BY RANKING MEMBER EDDIE BERNICE JOHNSON

Ranking Member Eddie Bernice Johnson  
Committee on Science, Space, and Technology  
Energy Subcommittee Hearing  
*Recommendations of the Commission to Review the Effectiveness of the  
National Energy Laboratories*  
2318 Rayburn House Office Building  
November 18, 2015; 2:00 PM

Opening Statement

Thank you, Mr. Chairman, for holding today's hearing. And I would also like to thank our witnesses for being here and providing their expertise on this important topic.

For over 70 years, our national energy laboratories have been at the forefront of advancing science and technology in the U.S. From the beginning, both competition and cooperation among the labs have been encouraged in order to foster an innovative environment that produces cutting edge research results. Our discussion here today focuses on what can be done to ensure that that research progress is sustained.

The report produced by this Commission, which two of our witnesses co-chaired, provides key insights into how we can more effectively manage these critical components of our national research infrastructure for the ultimate benefit of all Americans. I encourage the Department of Energy to seriously consider the recommendations in this report that aim to create the right balance between appropriate oversight of the labs and entrusting them with more independence to pursue innovative and cost-effective solutions to addressing DOE's mission needs.

I look forward to hearing the testimony from today's witnesses on how to best achieve these goals. With that I yield back the balance of my time.