



Welcome! In the past 3 months, Washington, DC has seen a lot of change and, with it, the MRS Government Affairs Committee has been adapting to the increasingly turbulent currents associated with a changing policy environment as it relates to materials research. This quarter, the committee has kept tabs on the changing nature of our government's policies, openly educated our legislators on the Hill, and coordinated a letter-writing campaign both online and at the MRS Spring Meeting. Other recent activities include selecting new Congressional Science and Engineering Fellows and publishing a study on Energy Critical Elements, which has gained a lot of attention nationally with the rare earth elements shortage. MRS is working hard to ensure that the voices of materials researchers are being heard and to develop smart government policy. Please enjoy the latest news!

What's Happening in Washington

Ronald L. Kelley, MRS Washington Consultant



Finally we have moved on to debate and discuss the President's FY2012 budget on Capitol Hill.

The outcome of a very protracted FY2011 appropriations resolution took place on April 8 after six months of delay and potentially devastating impact on science funding during an extended continuing resolution process. A substantial amount of MRS time and member assistance was placed on pushing back on the proposed cuts for science in the HR 1 bill. MRS was also very active in Washington with joint efforts involving coalition and science advocacy partners. In addition, MRS volunteers provided active responses to **Materials Voice** letters to Congress expressing concern about potential reductions in funding and assistance from participating MRS volunteers at our April Congressional Visits Day team meetings in Washington. The MRS advocacy efforts combined with those of other science colleagues truly helped minimize the short term losses, particularly at the DOE Office of Science. The same fundamental battles on spending levels continue with next year's proposed budget.

President Obama's FY2012 budget shows his emphasis on innovation and creativity through science, technology, energy research, and education. The specific details of the proposed budget call for increased spending in the physical sciences and attention to our global competitive position. These budget priorities have been made while other programs are being reduced. However, even the White House recognizes today that the levels that have been proposed for increases are not likely to survive the intense budget and appropriation scrutiny that has occurred since their February release. The budget proposed by House Republicans, chaired by Rep. Paul Ryan (R-WI), and the resulting guidelines that have been provided to the House Appropriations Committees suggest "top line" numbers that are from 3-6% below FY2011 levels and 13-16% below the President's request in those subcommittees which include NSF, NIST, and DOE Office of Science. Some of the largest proposed cuts are for the health related subcommittee with up to 24% reductions when compared to the President's budget request. The only appropriation category that is protected with minimal change is defense. Final numbers with details for individual accounts are far from being completed at this stage in the process. Appropriations hearings will continue and markups will take place in the House through July. As of this writing the Senate Appropriations Committee and Budget Committee leadership with the Democratic Majority have not yet established any number targets or outlined their schedule and process.

If anyone is interested in learning more about the proposed budget details and specifically the materials science component of the FY2012 President's budget request or would like to see final budgets for FY2011, please contact me at our Washington, DC office at (202) 256-5211.

Our divided government – White House, Senate, and House – will continue to be a challenge in moving forward on major funding decisions. Three primary topics for both parties are 1) budget priorities and acceptable spending cuts, 2) debt ceiling limits (discussions also include options for revenue generation including increased taxes), and 3) entitlement spending and options for minimizing or changing the long term federal obligations. Not only are we seeing the normal ("regular order") process take place for FY2012, but also a few other leadership groups have been established to see if resolution can be reached between Democrats and

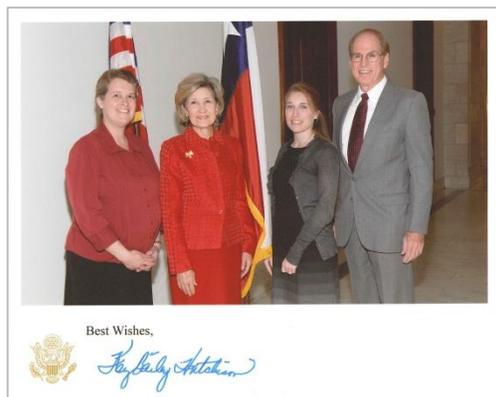
Republicans. A large, long term deal between the parties is not highly likely but many of the issues will be resolved in shorter term – six to twelve months – initial compromises. This process will take a lot of time to reach final appropriations for next year. The public, and now our politicians, are very aware of the need to manage federal commitments in new and different ways. But each party has very different proposed methods to achieve financial security. Smart decisions on federal spending are called for, and MRS believes careful investments are far more productive than across the board cuts. MRS continues to stress the near and long term benefits of sustained federal funding for science and the unique positive impact these research dollars provide in benefits to national security, energy, economy, healthcare, and a competent workforce.

New members of Congress in both the House and Senate continue to require education and awareness of our issues as they learn their new jobs. Some of the most experienced leaders in the Senate have continued to announce their planned retirement – including supporters of science like Senators Joe Lieberman (I-CT) and Jeff Bingaman (D-NM). At last count, over 8 Senators have announced their planned retirement.

Nanotechnology reauthorization legislation is needed in this session of Congress because a nanotechnology bill was not completed last year in spite of House efforts to pass the revised legislation. The NNI program has now been in existence for over a decade. The public release of the APS/MRS Energy Critical Elements policy study report has been very well received on the subject of critical materials, including rare earth elements. A number of Congressional staff and Member briefings have taken place on this topic already as well as hearings where the APS/MRS leaders have provided testimony in both the House and the Senate. There are a series of bills now pending in Congress in both the House and the Senate.

Congressional Visits Day

The 2011 Congressional Visits Day (CVD) on April 7 brought materials researchers to Capitol Hill for the opportunity to engage members of the House and Senate and their congressional staff in highly focused briefing sessions on funding and informational issues directly related to MRS. These issues, while often pertaining to the need for sustained federal funding in materials science, also set the stage for MRS members to serve as informational resources for members of congress and their staff. “This year’s CVD was during the critical week when the FY2011 budget was being settled. Our efforts could not have come at a higher leverage time,” said Government Affairs Committee Chair, Alan Hurd.



The current funding climate for materials research, and basic science research in general, presented a challenge for the 2011 CVD teams. While there is a recognition among congressional members and their staff that funding of scientific research is an important component in keeping the United States competitive, both academically and economically, and in generating innovation across academia and business, there is a strong mindset on Capitol Hill that funding must be significantly cut to share the pain of reducing the current federal deficit, including basic research. The challenge for the 2011 MRS CVD delegation was to provide a compelling story to staff about why there should be continued and meaningful federal funding to support materials research across federal agencies.

Through the efforts of the MRS CVD subcommittee and advice from Ron Kelley, MRS Washington Consultant, a series of briefing documents were generated to assist the CVD team members in relating the importance of research and providing evidence that federal funding can serve as a catalyst for innovation, economic development and educational excellence across the United States educational infrastructure. Nine highly motivated MRS teams including 31 participants were able to visit with 70 House or Senate offices on April 7.

Plans for the 2012 CVD are now underway and MRS members who have an interest in government affairs are encouraged to contact Alan Hurd, Government Affairs Committee Chair (ajhurd@lanl.gov) or Bart Sheinberg, CVD Subcommittee Chair (bart.sheinberg@hccs.edu) for information about participation.



Congressional Fellows Corner



For this issue, we spoke with Kevin Whittlesey, the 2006/2007 MRS/OSA Congressional Science and Engineering Fellow, about his time working in the House of Representatives. Kevin received a BA from Occidental College in 1996 and a PhD in Materials Science from Northwestern University in 2005. Afterward, he entered the complex and fascinating world of science policy in Washington, DC. Kevin recently started a new position as Science Officer at the California Institute for Regenerative Medicine in San Francisco, CA. Currently, Kevin serves as the Chair of the Congressional Fellows Subcommittee, which selects new fellows and maintains an (informal) alumni network of existing and past fellows.

1. When were you a Congressional Fellow and who did you work for? What kind of work did you do prior to coming to DC?

I was the 2006/2007 MRS/OSA Congressional Fellow placed in the office of Representative Doris O. Matsui. Prior to the fellowship I was a Christine Mirzayan Science and Technology Policy Graduate Fellow with the Committee on Science, Technology, and Law at the National Academies. I then conducted a postdoctoral fellowship at Aastrom Biosciences working to commercialize cell-based therapies, after which I entered the Congressional Fellowship program.

2. How did you enjoy your time on Capitol Hill?

I loved my time on Capitol Hill. As a Congressional Fellow, you are in the middle of the decision-making process related to research funding and policy topics that directly impact science and technology across the country. That is a very exciting position to be in and an opportunity that few scientists have. It is a dynamic and fast paced environment that was a very stark contrast to the lab environments I was accustomed to. It was such a rewarding position that I sought opportunities to stay on Capitol Hill and was hired as a Legislative Assistant for another member of Congress, Representative Anna Eshoo, where I stayed for another year beyond my Fellowship.

3. What would you say was your biggest accomplishment from your time as an MRS fellow?

As a fellow I developed the [Science Communications Act, HR 1453](#). That bill was designed to create an NSF grant program to provide communications training for scientists. The bill was passed by the House of Representatives and language from it was signed into law with the America COMPETES Act.

4. Is being a staffer/fellow the job you thought of when you applied? What was your biggest surprise?

I had talked with many current and former fellows when I applied, but the role of legislative staff was so different from any other environment that I had worked. Although I thought I knew what to expect, I was constantly being challenged with learning new policy issue areas and entrusted with important roles on the Congresswoman's behalf. The biggest surprise was the frequency with which I was expected to make very important policy recommendations based on limited information. As a scientist, my training would lead me to want the opportunity to fully research all sides of an issue and make fully informed recommendations. As legislative staff you rarely have time for that approach. I had to rely on others to provide me with the information that I needed to make those policy recommendations. I had to quickly learn a whole new way of approaching those tasks.

5. What are you doing now? How has your time as an MRS fellow influenced your current job?

I am currently a Science Officer at the California Institute for Regenerative Medicine in San Francisco, CA. After my fellowship, I worked for a year as Legislative Assistant to Representative Anna G. Eshoo. I was then selected as a member of the inaugural class of the FDA Commissioner's Fellowship Program, which placed me in the Office of the Commissioner working on regenerative medicine and stem cell regulatory policy. The skills and professional contacts that I developed during my MRS/OSA Congressional Fellowship were essential in obtaining both of those positions. My Congressional Fellowship set my career in an entirely new direction and I regularly draw on that experience.

Information about the MRS Congressional Science and Engineering Fellowship program and application process can be found at www.mrs.org/congressionalfellow.

Materials Voice – Your Voice Resonating on Capitol Hill



As many of you know, Materials Voice is an electronic and paper-based system by which MRS members can communicate directly with their legislators, in order to advocate for various issues that are deemed important by the Materials science research community. Typically, this is performed in several ways, either by electronic Public Affairs Alert messages or via the Materials Voice booth, which is staffed by graduate students during the Spring and Fall Meetings, with which many of you are already familiar.

Our biggest activity this quarter was a call to action, solicited through a Public Affairs Alert and an MRS homepage announcement, to the bill HR 1, which proposed a continuing resolution to fund the government for the rest of 2011 at a dramatically reduced rate, and imposed nearly draconian cuts to basic research spending, particularly to the Department of Energy's Office of Science and the National Institute of Standards and Technology. MRS moved quickly to send out a call to action, and the MRS members responded enthusiastically, with 2260 letters sent by 516 unique individuals leading the charge. The final spending bill was not nearly as drastic for those agencies. MRS considers this a great victory for grassroots advocacy and encourages our membership to continue to answer the call to make your voice heard in Washington.

If you'd like to send our current crop of letters, which deal with support for the 2012 research budget for NSF, DOE, DOD and NIST, as well as support for innovation and user facilities, please take a few minutes to visit www.mrs.org/materials-voice/ and send a message to Congress!

Government Affairs at the 2011 MRS Spring Meeting

Materials Voice – Your Voice Resonating on Capitol Hill

Another successful session of the Materials Voice booth (which utilizes pre-written letters to email Congress about important public policy issues related to materials research) was conducted in San Francisco at the 2011 MRS Spring Meeting.

We are pleased to announce that 89 unique MRS members participated by sending 820 letters that were pre-drafted by MRS committee members, and many of you took the time to write more personalized versions. For those of you who did not send letters, they are available on the MRS website at www.mrs.org/materials-voice. Please take a moment to visit the site and send a message to Congress!

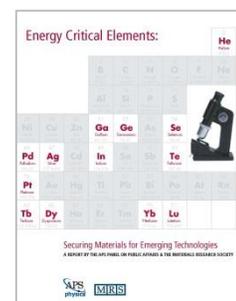
In addition to organizing your letter writing campaign, the MRS Government Affairs Committee also sponsored several events at the 2011 MRS Spring Meeting, including the "Science Policy Forum - Securing Materials for Emerging Technologies," and several individual Government Agency Presentations detailing materials research priorities and funding opportunities. Agency participants included: DOD-AFOSR, DOD-ARO, DOE-ARPA, DOE-BES, DOD-ONR, and NSF.

Measuring by attendance and response, the sessions were greatly appreciated by the membership. The content, ranging from highlights of the upcoming year's key topics to tips and advice on grant proposal writing and submission, is always of substantial member interest. Many members took the opportunity to meet program managers for one-on-one conversations. While we advocate for more government support of basic science research, these sessions allow the MRS Government Affairs Committee to complete the circle by helping to ensure that government support reaches the members we represent.

Science Policy Forum:

Energy Critical Elements – Securing Materials for Emerging Technologies

Even Dilbert is aware of a crisis in rare earth metals with so many news reports and studies emerging. A recent panel convened by the American Physical Society (APS) and the Materials Research Society took a fresh look at the issues in resource availability. Co-Chair Jonathan Price (University of Nevada, Reno) reported the panel's recommendations on *Energy Critical Elements (ECE)* for the first time to an MRS audience. Released on February 18, 2011, *ECE* covers not just the famous story of Chinese control of neodymium—required for high strength



magnets in electricity generation and transportation—but also considerations for non-rare earths, non-platinum group elements, and even one noble gas. The common thread is market-unstable elements that potentially limit global deployment of novel energy technologies.

Although geopolitics widely affects ECE market stability as much as crustal distribution, less appreciated is the impact of innovative technology. China's capture of the rare earth market was enabled by innovative extraction of metals from low-grade ore. China's geopolitical advantages helped: low-cost labor and loose environmental regulation. Today, China commands the rare earth market because competitors have dropped out. Neodymium prices have shot up over 750% since mid-2010.

Price, the Nevada State Geologist and Director of the Nevada Bureau of Mines and Geology, is a well-known economic and exploratory geologist. He noted that demand outstrips population growth because of lifestyle improvement especially in China, Brazil, and India. China is the world's leading producer of steel (45%), rare earths (97%), aluminum (41%), tungsten (85%), and molybdenum (40%) to name just a few materials, in each case taking over from the US who now leads only in helium and beryllium. While crustal distribution is a factor—interestingly aluminum bands the Earth's equator—economics dominates price. For example, the huge \$100 billion per year market in copper completely dominates the production of tellurium, a market three orders of magnitude smaller, even though Te is critical for thin-film solar cells. Price showed data correlating the cost C per kg with abundance by weight A over 8 orders of magnitude in $A, C \sim A^{-\nu}$ where $\nu \sim 0.6$, but element-to-element cost scatter covers two orders of magnitude due to economics. Helium, though scarcest per atom, is inexpensive because demand is limited to low-volume applications such as welding, heat transfer gas, and low-temperature physics. Helium's low cost is transient on our species' time scale: barely gravitationally bound to the planet and produced slowly by radioactive decay, party-balloon atoms are for most purposes lost to future generations.

The APS-MRS report makes five policy recommendations. The US government should establish an executive branch body to oversee ECE availability, assign an agency to collect and distribute ECE information on abundance and price, fund workforce development and research in ECE science, encourage recycling and efficient use of ECEs, and avoid market interventions such as stockpiling.

Panelist Ron Kelley, MRS Washington Consultant, noted in discussion that seven legislative bills are currently in play and jurisdiction is up in the air. A \$30M R&D program for substitutional research has been announced by ARPA-E and more research is proposed as a Department of Energy research hub. Multinational corporations are scrambling to mitigate ECE price volatility.

Panelist Alex King, Director of Ames Laboratory, reported on an international rare-metals workshop in South Korea on April 18-20. Every country has a different list of ECEs and availability predictions tailored to their circumstances. China expects to lose self-sufficiency in Fe, Ni, and Al within 20 years. Many countries list Be as critical except the well-supplied US, which is “the China of Be”.

Panelist Alan Hurd, Director of the Lujan Neutron Scattering Center at Los Alamos and Chair of the MRS Government Affairs Committee, noted that helium, the panel's most challenging case study in stockpiling, illustrated the complexity of ECE markets. Since the US Congress decided to sell off its large strategic stockpile of helium in 1996, prices have actually gone up.

The policy study was a joint effort between the American Physical Society (APS) Panel on Public Affairs and the MRS Government Affairs Committee with assistance from members of the geological community. The report was released on February 18, 2011 and is available on the MRS Web Site at www.mrs.org/advocacy/ece.

Materials Science in FY2012 Budget

Each year, MRS is asked by the American Association for the Advancement of Science (AAAS) to contribute a budget analysis of the Administration's proposed budget. If you would like to review the details that are contained in that assessment, please link to the following site and select Chapter 26. The AAAS site will also give you access to many other organization's assessments of the proposed federal research budget. <http://www.aaas.org/spp/rd/rdreport2012/>

In the Next Issue...

Federal Directions for Materials Science and Engineering - Government Agency Leadership Summit

Important aspects of materials science and engineering are funded across numerous government agencies. There are many challenges which are driving new investments in materials research and development across all of the agencies. These issues include: energy sustainability, defense and national security, economic vitality, health care, climate, and the basic science foundation necessary to provide new knowledge, create a professional workforce, and enable engineering breakthroughs. The fact that materials science and engineering is strongly supported by various parts of DHS, DOD, DOE, NIH, NIST, and NSF underlies the belief that materials science and engineering is an enabling discipline for so many areas. However, there is minimal dialogue across the agencies that support materials science and engineering to explore opportunities for collaboration and investment synergies, and minimal opportunity to interact with materials society leadership

To improve the dialogue between agencies and enhance the understanding of future federal directions for materials science and engineering, a one-day summit of government agency senior leaders responsible for materials programs was held on January 12, 2010. This year's summit will again be a limited attendance event to enable discussions of priorities and program directions with an opportunity to explore synergies and potential collaborations on July, 21, 2011. This event would be hosted jointly by MRS and TMS and include leaders from other professional societies that represent materials science and engineering. We plan to continue this event on an 18-month cycle as a forum for idea exchange between agencies and within the materials science and engineering community.

The goal of the summit is to provide a forum for government agency leaders to interact with each other and to share information in areas of common interest, in order to identify synergies, advance understanding, and maximize impact across all parts of our nation's science and technology investments.

Feedback

You have received this newsletter (complete PDF version available at www.mrs.org/intersections-spring2011) as a result of your subscription to INTERSECTIONS, our MRS Public Affairs Alerts or your participation in our Materials Voice letter-writing campaigns.

We welcome your feedback and invite you to submit topics for consideration in future issues of this newsletter. Please send your comments to publicaffairs@mrs.org

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