

Panel on Public Affairs Meeting
February 4, 2011
529 14th Street, NW, Suite 1050, Washington DC

Members present:

R. Socolow, V. Narayanamurti, J. Dahlburg, R. Rosner
W. Barletta (via phone), J. Davis (via phone), V. Ehlers, R. Falcone, A. Falk, M. Gunner, F. Houle (via phone), R. Jaffe, L. Krauss, G. Long, P. Looney, J. Onuchic, S. Seestrom, J. Trebes, M. Turner, E. Ulrich

Guests:

Michael Desmond

Advisors/Staff present:

B. Barish, W. Byer (via phone), K. Cole, K. Kirby, M. Lubell, J. Russo, F. Slakey

Members Absent:

K. Schwab, R. Schwitters

Call to Order

R. Socolow called the meeting to order at 8:15 AM.

Welcome, Introductions, & Approval of Minutes
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R. Socolow welcomed everyone and asked for comments on the October minutes.

Action: A. Falk moved to approve the minutes of the October 1, 2010 POPA meeting, as presented. Motion was seconded by V. Narayanamurti.

The motion to approve the minutes passed unanimously.

Purpose & Activities of POPA

Overview

F. Slakey provided an overview. There are two activities that dominate POPA's time: developing APS policy statements and carrying out studies. APS statements fall under five topical areas: Education, Ethics & Values, Human Rights, Internal Policy, and National Policy. POPA's responsibilities re: policy statements include (1) drafting statements on the aforementioned topical areas and (2) reviewing Council-approved statements every five years to determine whether any should be archived. The other major responsibilities of POPA include conducting studies and producing reports. Ideas for studies can originate within POPA or come directly from the APS membership. The studies build on previously adopted APS statements; they don't create new policy positions, but build on existing positions and advance statements that have already been passed. POPA will often team with another organization to conduct a study, if doing so results in a more expert assessment of the topic. As a rule, a POPA member

will volunteer to assemble and lead a study committee through exploration of the chosen topic. The timetable for a POPA “Short Report Study” is eight months, on average, with a budget of approximately \$15K - \$25K. This results in a short (< 30 pages) report that presents 5-8 recommendations which are relayed to Congress. In certain circumstances, we will push for press coverage (which may include an op-ed in a major publication). For topics that require additional time, funding, and/or comprehensive research, larger studies can be conducted as an “APS Report Study.” Such an effort results in a longer report (ex. APS Energy Efficiency Report).

POPA is also responsible for drafting letters under the POPA Chair’s name, and responding to concerns voiced by the Society’s membership. POPA does not handle budget issues. Budget issues are under the purview of the Physics Policy Committee (PPC). PPC is concerned with how the public impacts physics; POPA is concerned with how physics impacts the public. PPC crafts the budget lobbying strategy for APS.

Generation of Study Proposals

J. Dahlburg discussed, in more detail, how ideas for POPA studies are generated and asked new members to consider bringing ideas to the table for new studies. She reviewed a template outlining the information that must be included in any study proposal brought to POPA for consideration.

Proposals must include:

- the objective of the study
- motivation and background
- opportunity
- approach/plans
- participants of the committee
- deliverables
- duration & funding
- a proposed title
- topical area that the study falls under (POPA Subcommittee)
- name of the member proposing the study & their contact information.

Commentary: R. Socolow opened the floor for questions. M. Turner inquired about the number of studies POPA normally handles per year. F. Slakey said it ranges from 1-3, annually. R. Falcone questioned whether there was space for a “topical area” concerned with matters of international scope. The POPA Nuclear Forensics Report was cited as an example that included international perspectives. “Research & the Economy” may be an area worth exploring for studies of interest. K. Kirby stated that the Society is very interested in moving in a more international direction and welcomes ideas on how we can support our international members. She proposed establishing a POPA Subcommittee on International Issues. M. Lubell said we would require international representation on POPA if we intend to do this. K. Kirby agreed. R. Falcone suggested tweaking the current subcommittee designations to include international issues, instead of creating a new subcommittee. The subject will be taken up later, at greater length, under *Subcommittee & Membership Business*.

Energy & Environment Subcommittee

R. Jaffe reviewed the steps taken, from inception of the idea to completion of the Energy Critical Elements Report, for the benefit of new members. The idea for an ECE study was brought up in discussion with the Energy & Environment Subcommittee and there was enthusiasm about researching the topic. The Subcommittee drafted a proposal, which was presented at the June 2009 POPA meeting. There was discussion of partnering with another society; it was felt the topic could be informed by disciplines outside of physics. F. Slakey & R. Jaffe spoke with geologists, the Materials Research Society (MRS), and others. MRS contributed \$10K towards the study. A study committee was assembled – a broad spectrum of geologists, economists, materials scientists, and policy savvy professionals. The committee took time to investigate the scope of the problem. R. Jaffe approached Ernie Moniz of the MIT Energy Initiative (MITeI) to gauge his interest in hosting a technical workshop in April. MITeI agreed the workshop was in line with their objectives. Six white papers emerged from that first meeting. International & domestic government views were represented. The second workshop was held in Washington, DC in September. POPA approved the final report in December and the APS Executive Board will review it at their next meeting.

R. Jaffe discussed the work that has continued since POPA's approval. F. Slakey and R. Jaffe have taken the study to congressional staffers. Senator Mark Udall (D-CO) will introduce a bill that includes all but one of the recommendations listed in the report. An op-ed is being drafted for inclusion in a national newspaper. A press conference will be held at the AAAS annual meeting on 2/18/2011 to publicly roll out the study. F. Slakey mentioned a possible meeting with the Heritage Foundation. A meeting with the American Enterprise Institute is scheduled.

Commentary: L. Krauss said he was surprised by how quickly legislation has been introduced. F. Slakey said the report had excellent timing. F. Houle said this was one of the most interesting topics she had ever worked on. It presented a wider perspective of the ECE problem. Industry often doesn't consider availability of materials after production scale up. The report will be of interest to many people on many levels. E. Ulrich commented that Udall's office is receptive because Molycorp has been talking about this issue for some time. Molycorp is a company based out of Colorado that owns a shuttered mine that produced the majority of the rare earth elements in the United States. They are working towards reopening that mine and expanding their operations so we can secure a supply of critical elements domestically. Gifford's office is having conversations with the Udall office. There is interest in the Science Committee. R. Jaffe mentioned that Molycorp seems the model for how to go about re-opening a mine; they've been exemplary in mediating the environmental issues. M. Turner asked if the report addresses the unknown unknowns. R. Jaffe said we aren't even able to predict the present because information is lacking. The list of elements that are considered critical is constantly changing. R. Falcone mentioned tightening up uniformity when referring to the government (U.S versus Federal). He asked if there should be some international emphasis; are there recommendations that have a more global character to them? R. Jaffe said they spoke with a representative of Korea and their policy issues are very different from those of the U.S. The EU might have more commonality. R. Jaffe said he thinks people will read the report with interest outside of United States. R. Socolow asked R. Jaffe if he had considered any follow-on studies, and offered the technical analysis of substitutability as a possible topic.

R. Socolow asked if there were any other ideas for studies that might be considered by the Energy & Environment Subcommittee. M. Lubell mentioned a study on demand-side management of the electric grid as follow-on to the Electric Grid Study. Tina Kaarsberg brought an idea for a geothermal power assessment to the table at the last meeting. R. Jaffe said he doesn't think a POPA committee should be conducting technical assessments. F. Slakey clarified the difference between POPA Studies and APS Studies. APS Studies may include some components of a technical assessment. E. Ulrich said there hasn't been a comprehensive study on the general resource intensity of energy technologies and that might be a good topic for us to take up. R. Socolow said Argonne National Laboratory has already done some of this work. E. Ulrich countered that making this information more available to the public would be good. R. Jaffe agreed this is an interesting topic. J. Dahlburg said it might make for a good APS study.

National Security Subcommittee

J. Davis began with a look back. At this time last year, the National Security Subcommittee was in the process of rolling out a report on technologies for treaty verification. F. Slakey spoke about the two recommendations within the report that haven't been acted upon yet. Activities associated with these two items will keep us busy for the next several months. The first recommendation is elevating the priority of non-proliferation in the NRC licensing process. APS petitioned the NRC to start requiring proliferation assessments as part of their licensing process. The NRC accepted this petition on 12/23/2010. A request for commentary has been placed on the APS website. J. Lieberman and F. Slakey are working with the arms control community to make them aware of the comment period. Comments will be accepted until 3/8/2011. J. Trebes asked how we extend this same concern to other countries. F. Slakey explained that a change in the licensing process would affect three companies building enrichment facilities in the United States today. These three companies build in other countries as well, so while our petition may be for licensing change here in the U.S., it may have a global effect.

The second recommendation is establishing a program of information sharing among nuclear related industries. We are suggesting that information be shared between companies that produce vacuum parts used in building an enrichment facility. The trade association is interested in holding a workshop that would include representatives of these companies, urging them to share information on any suspicious orders they receive. Representatives from these companies have indicated that they receive at least one suspicious order per week. They don't fill these orders, for fear they may be used to build covert enrichment facilities. But they also don't currently share this information with any other companies manufacturing the same parts. Sharing information could help shed light on and obstruct nefarious activities, worldwide. R. Socolow asked why the FBI isn't involved. F. Slakey said we haven't suggested sharing this information with the intelligence agencies because private companies tend to freeze up when asked to do so, for fear of punitive actions being taken against them. Maybe over time, the information sharing could be built out.

J. Davis spoke to another topic. He said when you look at the record of ratification for the new START treaty, there are two interesting statements that the Senate insisted upon; (1) any future negotiations now open on tactical nuclear weapons with the Russians can no longer be swept away and (2) the triad is to be maintained moving forward. Suggestions for studies related to this subject were offered.

Commentary: J. Trebes said that it would be a good idea to have a discussion with the public as the numbers of weapons are ratcheted down. J. Davis said a study on what an evolving triad looks like, or something in that vein, might be good. J. Trebes asked what the goal of such a study would be. J. Davis indicated that it would probably be a study for the purpose of public education, with the possibility of getting into policy matters. There was some misgiving as to whether POPA could really say anything on this topic.

J. Davis also offered another idea for a technical study on the types of technology that we would like to have in the future. He referenced Dwight Eisenhower's 1956 "Open Skies". He understood that the behavior of the nuclear powers had to change and the behavior of the world had to change, in terms of absolute security, in order to reduce our cache of nuclear warheads to 500. It would be interesting to have a publicly-held satellite constellation that every country had access to. We would have to consider how to keep such technology from nefarious purposes. But understanding where and how many nuclear weapons there are, in real time, may work to change behavior.

National Research Policy Subcommittee

M. Lubell provided background on a study that was suggested by the National Research Policy Subcommittee at a previous POPA meeting, and was subsequently sent to PPC for further discussion. PPC is taking up the issue of innovation to try to understand the whole enterprise better than we currently do. Jim Roberto is Chair of the PPC study. The goal is to convey to policy makers and other communities what can be improved. Members of POPA are welcome to participate. The first meeting will be held March 17th – 18th in Washington, DC. The study committee will hear from experts with interesting views on this topic, including: Greg Tassej from NIST, Allen Taub (VP of R&D at GM), Steve Koonin, possibly Norm Augustine, and some others. The study committee will hear from the technical, manufacturing and labor sectors, economists, etc. The committee will aim to complete the study in 9-12 months.

Commentary: P. Looney, J. Trebes, R. Rosner, and J. Dahlburg all demonstrated interest in participating.

Physics & the Public Subcommittee

R. Socolow introduced the issues. Two statements were proposed through the Physics & the Public Subcommittee, one directly from the Subcommittee on the misuse of quantum physics and the other from the APS Division of Biological Physics on healing energy. POPA approved the statements and sent them to the APS Executive Board for review. The Board rejected both statements, providing comments on how to improve both and what additional information to include if POPA decides to bring the statements back for a second look. K. Kirby said that all proposed statements should include three pages of background information that include details on how the statement will be used, why APS should take a stance on the topic, how urgent/timely the topic is, and what actions might be taken once the statement is adopted. Doing so will help the Executive Board reach approval. If a statement comes before the Board for a second time, a second rejection renders all future consideration void. K. Kirby suggested creating a template to ensure smooth sailing. F. Slakey reminded POPA that all statements will also go out to APS membership for review & comment. R. Socolow said there are two issues to

handle today; (1) what to do with the statements that have been rejected, and (2) how to handle statements, in general, moving forward.

Commentary: L. Krauss said we shouldn't discuss the two, rejected statements at this meeting. He suggested that the Subcommittee create a "statement proposal template" and present it at the June POPA meeting. M. Lubell said we should make broader, more enduring statements. L. Krauss cautioned that we must balance making statements on specific issues of an urgent nature with a partiality for making statements on issues that have broader scope and endurance. M. Turner suggested we include information on "What is a Statement?" within the proposal template. F. Slakey, K. Cole, L. Krauss, J. Dahlburg, and J. Russo will create the template and accompanying verbiage on what constitutes a statement prior to the next POPA meeting in June. The Steering Committee will review the template prior to the next meeting and circulate it to all of POPA. The Physics & the Public Subcommittee will use the template to package the two, tabled statements for a second presentation to the Executive Board.

Information to include in the template:

- Urgency
- Why is this an APS issue?
- Background/Context (how it relates to other organizations, potential allies)
- Potential Actions
- Probably shelf-life (if there isn't a shelf-life, it might not be worth making a statement)

Direct Air Capture

R. Socolow provided a brief overview of the chronology of the DAC study and the study committee's membership. He provided an explanation for the change in co-chairs throughout the course of the study and introduced his current co-chair, Michael Desmond. He explained how raising additional money created an opportunity for a new "hybrid" form of a study that fell between the POPA "Short Report Study" template and the larger APS Study format. Today's action will be to vote on whether POPA recommends the final product to the APS Executive Board. R. Socolow presented slides to review the major points of the final draft of the report/technical assessment. R. Socolow discussed where the funds for this study came from (DOE, Dreyfus Foundation, H. F. Lenfest, NCEP/Bipartisan Policy Center, APS-POPA). He also discussed the three experts that the study committee met with (David Keith, Klaus Lackner, Peter Eisenberger) and shared information on the organizations/people funding their research. (Keith – Bill Gates; Lackner – Venture capitalist firm; Eisenberger – won't disclose). As a matter of policy, the Committee sought to avoid learning any of the expert's ideas that could not be made public. It was noted that the research agenda has been taken out of the current draft copy of the report because it was determined we should not provide advice to Congress on this topic.

Commentary: R. Jaffe began the discussion by saying he doesn't agree with the neutral tone of the report's recommendations. The length of the report belies an importance that he doesn't feel the report deserves. He said the example of the "flow box" is misleading; he went on to describe how preposterously big an actual scaled project would be. He

said, unless there is a strong negative recommendation included, he can't support the report. L. Krauss said he has similar concerns about the impracticality and huge amount of uncertainty about the details. He said he feels there is more room here for a statement than a study. If the report could have said "we have been able to reduce the uncertainties" then it would be better. J. Dahlburg said she shares the technical concerns but she also said that changing the genre of this end-product from a "report" to a "technical assessment" and asking us to vote on it today isn't right. If it's going to be a technical assessment, then it actually has to provide an assessment across the board. She would expect to find more "pros & cons" in a technical assessment. She's asking for scenarios in the "good", "bad", and "what we hope for" categories. L. Krauss said he thinks we should include all scenarios, not just a mid-range, because we are educating the general public and the general public doesn't understand uncertainties. At operation costs of \$100/ or \$600/tCO₂ per year, will this type of technology ever happen? R. Socolow said the committee isn't willing to say "yes" or "no". R. Jaffe said that a study comparing the cost of different types of de-carbonization technologies would be interesting. E. Ulrich said the public isn't going to understand the idea of a square "flow box" that you can place behind your house. It'll give them the sense that they can purchase a box and become carbon-neutral; they won't understand the magnitude of the undertaking to implement DAC. R. Falcone thinks there are valuable contextual ideas that are included in the report, but it doesn't present as a true technical assessment. A. Falk said people who read this report, and especially the first few pages of the report, must come away with the clear understanding that none of this makes any sense until we have zero-carbon energy systems, which we are nowhere near having. It's not worth thinking about DAC until we solve the other problem. That is how the report should be framed. J. Trebes said he found figures of merit and other handy items in the report, but he was left thinking, "What is this all about?" He called Roger Aines, a member of the study committee, and he said they were trying to convey that we don't want to implement this technology now, but don't count it out because innovation might save the day at some point. J. Trebes said the executive summary doesn't seem to get at that point. The first paragraph of the executive summary really needs to be rewritten. V. Ehlers said we can't assume that science is going to solve all the problems. He said we have to be very careful about giving false hope that science is going to save us from ourselves. There should be a number of caveats. M. Turner mentioned that if the primary audience is the general public, then he agrees with V. Ehlers. If it's the science communities, then he isn't as worried about that, but he does think we have to consider what value-add we bring to the table. Is this \$600/tCO₂ number a new figure? He shares J. Dahlburg's concern of whether we've produced a good technical assessment. R. Socolow confirmed that the numbers in the report have not been published before. G. Long said the focus should be on the audience and whether the concerns that are addressed in the report are emphasized appropriately. R. Jaffe said he thinks the long study format belongs somewhere else, not in POPA. He would like to see a discussion of scale in the report's executive summary. He would like to include a statement that indicates what de-carbonization of a single power plant would require -- the installation of a system 5 kilometers long x 100 meters high. He would like to include language that speaks to the idea that an aggressive research program on post-combustion carbon capture could act as an insurance program that would allow work on this general subject to move forward. R. Socolow said the point of Chapter 3 proves that a post-combustion carbon capture program would not be sufficient. P. Looney echoed R. Jaffe's requests, but requested the benchmark used in the executive summary be a 1-gigawatt coal plant. M. Desmond said

the issue with scale is a fair point. M. Gunner said it's not just about scale, but also cost. Large scale investments cannot be made for technologies that won't pay out for a hundred years. She supports a stronger "no" statement than the report currently imparts. R. Rosner said certain calculations are missing. What are the infrastructure costs? The hefty expense should be overtly stated. L. Krauss said the challenges of this technology should be presented up front; if the final product is going to be a technical study, we need to identify and include a range of knowledge. M. Lubell said that the public doesn't react well to uncertainties. The problem with including a number in the report is that you have to be extremely careful about the uncertainties, up and down. V. Narayanamurti said we should help the committee reshape the executive summary, add a few "back of the envelope" calculations, and then move forward. M. Lubell suggested that *Reviews on Modern Physics* may be a good outlet for the report to inform the science community. S. P. Looney said he thinks the report needs a realistic figure for pressure drop in the text. R. Jaffe said he is really concerned about publishing this report. If we are going to start doing technical assessments, this isn't a good one to start with. We need to do it right. It feels as though we've been backed into doing technical assessments. A technical assessment belongs in a technical journal. R. Jaffe urged that we not put this forth as a technical assessment. L. Krauss said he compares the DAC Study to a previous APS Study on early missile defense. That study was technical and had a finite conclusion. If the purpose isn't to provide policy recommendations, but rather an educational review of a topic, then it shouldn't be framed as a technical report.

Action: Modifications to the report need to be made, including:

- The scale in size
- The scale in costing (capital cost of a system)
- Make sure the large uncertainties are clearly stated
- Make sure it is clearly stated that DAC may eventually have a role to play in countering emissions from decentralized sources of CO₂ that prove expensive to reduce by other means
- Include information on the pressure drop
- Include information on the footprint of a realized system

J. Dahlburg, M. Desmond, R. Socolow, and V. Narayanamurti will work on revising the report. A vote will be taken, via email, after the modifications are made. The report will then be sent to the APS Executive Board for review at their April meeting.

R. Socolow requested a straw poll. He asked, "If the modifications requested are made, will POPA lean towards voting to recommend the DAC Report to the Executive Board?"

Action: A straw poll was taken, resulting in a vote of one abstention, one "no" vote, and the remainder of the group voting "yes" to recommend.

Subcommittee & Membership Business

We started considering the subcommittees and who might be interested in each. R. Jaffe asked about the responsibilities of the Subcommittee Chairs. Then it was suggested that some protocol be written and documented somewhere as to what subcommittees were to do in between meetings and what the Chairs are responsible for. Members signed up for each subcommittee. Each subcommittee will come back to the June meeting with a decision on the name of their subcommittee and whether they will incorporate focus on more international topics.

Jeanette will send around the list to make sure everyone is correctly accounted for.

Kate Kirby asked POPA to provide nominations for POPA 2012.

Old Business

Kate Kirby provided an overview of the changes that were made to the constitution and bylaws.

Next Meeting

The next POPA meeting will be held on **Friday, June 3rd, 2011.**

Adjournment

Action: A motion to adjourn the meeting was made at 2:40 PM.

The motion to adjourn the meeting passed unanimously.