Testimony Before the House Subcommittee on Energy and Power on H.R. 4255, the Accountability in Grants Act of 2012

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September 11, 2012

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I deeply appreciate the invitation from Chairman Whitfield for the opportunity to testify today on H.R. 4255, the "Accountability in Grants Act of 2012." While I understand the concerns which motivate this piece of legislation, I firmly believe that any cuts to grants or other financial assistance issued under section 103 of the Clean Air Act should come through a careful assessment of which research best helps to advance the mission of the law, protects the health and safety of Americans, and advances our cooperative global operations abroad. A blanket ban on all funding to foreign institutions will not achieve these reasonable and prudent goals. The simple physical fact of the matter – which cannot be negotiated around – is that harmful environmental pollutants, especially airborne contaminants, do not respect national boundaries. The EPA cannot responsibly implement the intent and purpose of the Clean Air Act with the restrictions that H.R. 4255 would place upon it.

In what follows I will first describe the purpose and objectives of the Clean Air Act – one of the most significant pieces of bipartisan legislation passed in our history – and the role that section 103 grants to foreign partners play in implementing it. In the second part of my testimony I will offer evidence for how 103 grants to foreign partners helps to protect the health of Americans, fulfills our foreign policy objectives, ensures

American competitiveness, and delivers on our global obligations for solving global environmental problems.

At the outset I should say that my academic research has never been supported by an EPA grant of any kind. I have not been part of a larger research team supported by the EPA, nor have I applied for support from the EPA for my work. I have however participated on funding review panels at the National Science Foundation for seven years, and that experience has given me insight on the importance of international cooperation in endeavors such as those covered in the legislation under discussion today.

1. The Clean Air Act and Section 103 Grants

a. The Clean Air Act is crucial for American public health and preserving economic growth.

Because section 103 grants are a part of the Clean Air Act (CAA), we should start by reviewing the rationale behind the CAA as a precursor to discussing the specific role these grants play in the delivery of the benefits provided under the Act.

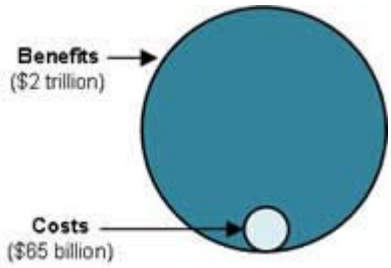
The CAA is a landmark piece of legislation which has been significantly amended and improved, following bipartisan leadership from the executive and legislative branches. It provides crucial protections to the American people, and is a good demonstration of cost-effective management of public health. The benefits of the CAA are numerous and clear. To state just a few:

- According to the EPA's "second prospective study," as of 2010, the 1990 Clean Air Act Amendments prevented hundreds of thousands of deaths from ozone and particulate matter, comparative avoided numbers of avoided heart attacks, millions of cases of asthma and chronic bronchitis, and prevented thirteen million lost work days. By 2020 these figures will increase significantly.

- There are $2 trillion in economic benefits from the Clean Air Act.

- On a conservative estimate, benefits exceed costs by 30 to 1. On a high scenario estimate, the factor is 90 times. Even on lower estimates, benefits exceeds costs by about three to one.

- This net improvement in economic welfare is projected to occur because cleaner air leads to better health and productivity for American workers as well as savings on medical expenses for air pollution-related health problems. The beneficial economic effects of these two improvements alone are projected to more than offset the expenditures for pollution control.[1]



b. Section 103 grants to foreign partners support the objectives of the Clean Air Act.

The Clean Air Act defines the EPA's responsibilities for protecting American air quality and the stratospheric ozone level. International grants under section 103 are essential for achieving these goals. The characterization that grants to foreign partners represent "an example of EPA mission creep and abuse of discretion," as asserted in last

February's hearing on the FY2013 EPA budget, is not supported by the facts.[2] Putting aside the issue that the grants in question represent a tiny fraction of the annual grant investments each year from the EPA – and that most of those that have been called into question by the majority were initiated under President Bush – the Section 103 grants as they have been issued are well within the EPA's statutory mission in the Clean Air Act. As stated in the EPA's response letter to Energy and Commerce Committee Chairman Fred Upton:

> The issuance of these grants is a principle means by which the EPA, in concert with States, local governments, tribes, multilateral organization, educational institutions and nonprofit organizations, *achieves its mission of protecting human health and the environment*. The provision of grant funding as a major tool in implementing these goals enables the Agency *to maximize its investments by utilizing the skills and expertise of those entities which work daily on specific issues or in specific areas*.[3]

At the end of this testimony there will be more detail on the point of how these grants maximize and augment the investments made by the EPA. For now, consider two straightforward reasons as to why addressing air pollution internationally matters here at home.

- Air pollution does not recognize national borders – it is a threat which has trans-boundary impacts. As such, efforts to address air pollution problems abroad have direct domestic impacts that are categorically different than other types of pollution with limited migratory properties.

- U.S. funded research on air pollution abroad can be put to practical use at home. When the EPA funds research and pilot projects to discover what works in

> Jakarta, that research helps us understand what we can do to better improve air quality in our own rapidly growing cities. Funding such work is one of the key ways to generate the cutting edge information we need to address domestic and foreign clean air issues and help to shape that research for the benefit of all.

There are eleven kinds of projects which are funded by these grants. A few project types are listed below, along with descriptions of general activities in FY 2011, the relevance of these activities for the United States, and some of the more notable success stories which give a real feel for this work.

Indoor Environments. These grants fund activities which support organizations in undertaking outreach education strategies on indoor air pollutants and potential health risks. This includes a special focus on activities which support addressing air pollution exposure to children and other disproportionately impacted segments of society. In FY 2011, these grants conducted training courses and outreach activities for environmental health professionals on indoor air quality topics, including asthma triggers, schools, radon, indoor air quality in homes, large buildings, and community outreach.

Consider for example, the Global Alliance for Clean Cookstoves. This program integrates the activities undertaken by the Partnership for Clean Indoor Air, to reduce the air pollution impacts on populations like the 75 percent of Africans who still burn wood, charcoal, dung, crop residue, and coal for cooking and heating. There are many benefits to local communities which stem from this program. Among them, time spent collecting fuel often puts women at risk, and exposure to cookstove smoke is one of the worst risk factors for disease, causing two million premature deaths annually, mostly from women and children. These emissions also contribute significantly to climate change through the production of black carbon. Actions that reduce this pollution are

one of the more cost-effective ways of mitigating greenhouse gases. EPA grant-making has supported over $300,000 in these activities in Kenya and Ethiopia alone.

Radiation. These grants fund activities that support the national environmental radiation monitoring program. This program "prepares for and responds to incidents involving nuclear or radiological material, oversees the safe disposal of radioactive waste, maintains laboratories that perform radiological sampling and analyses, and provides standards for protecting human health and the environment from radioactive material."[4] In FY 2011, grants in this category funded radiological laboratory capabilities and capacity abroad. Radiation, like air pollution, represents a transboundary threat. Activities funded by the EPA to address this problem can provide information for addressing radiation problems domestically and in key strategic countries helping to politically stabilize them in the near term.

Community-Scale Air Toxics Ambient Monitoring. These programs fund, respectively (a) two-year projects which help state, local, and tribal communities to identify and profile toxic air sources and (b) establishment of local agencies to enhance monitoring networks and reduce the impact these toxins have on communities and local air pollution control agencies to purchase capital equipment.

Relatedly, EPA support assists the Global Mercury Supply and Use-Management program. According to the EPA, "Mercury is a potent neurotoxicant that negatively impacts human health and the environment around the world. Mercury pollution is transported globally in the atmosphere, so mercury emitted far away affects people and ecosystems in the United States."[5]

This program provides financial assistance to address mercury issues in a few forums, including negotiating a legally binding instrument for the global control of mercury pollution, participating in the United Nations Environment Program's Global Mercury Partnership, established to achieve reductions in use and emissions of mercury globally, and supporting regional activities, including efforts in the Arctic, Asia, Europe, and nationally across North America (North American Regional Action Plan on Mercury).

Mobile Sources Technologies. These programs fund studies for advancing engine development technology to optimize fuel economy, reduce exhaust emissions, and improve performance, as well as harnessing innovative technologies to address fuel consumption and emissions reductions for heavy duty diesel trucks. This is in the national interest for at least two reasons. First, with new fuel standards on U.S. vehicles, strengthening the demand for cars with optimized fuel economy abroad supports competitiveness of U.S. products overseas. Second, vehicle emissions are not confined to the country which emits them. American public health is impacted by rising emissions from other countries.[6]

For example, EPA grants are helping to improve vehicle fuels and promoting emissions control technologies in Sub-Saharan Africa. The EPA is working to leverage resources already available as a founding member of the Partnership for Clean Fuels and Vehicles.[7] EPA grants have contributed $3 million to these initiatives in Kenya. In North Africa, several countries still use lead in gasoline, which the EPA is working with UNEP to eliminate.

Climate Change/Climate Protection Partnerships. These programs supports activities, including voluntary government and industry partnership programs, to improve understanding of climate change, and help direct and maximize investments in

mitigation capacity while creating policies needed to ensure these reductions in greenhouse gases actually occur. This includes outreach and education to help public and private actors meet climate goals and break down market barriers to clean and efficient technologies.

For example, EPA grants funded methane reduction programs in India, a powerful pollutant which both contributes to agricultural losses and acts as a greenhouse gas. India is a charter member of the U.S. led Global Methane Initiative (GMI, formerly Methane to Markets program created by the Bush Administration in 2004) in large part due to EPA assitance[8]. In general, GMI provides international cooperation to reduce methane and harness it as a source of energy working with the private sector. Investments toward the GMI, including $25 million from the State Department, have leveraged more than $387 million since it was launched.[9] The partnership provides private sector opportunities to decrease methane across agriculture, coal, landfill, natural gas, and wastewater sectors for U.S. businesses and has successfully created U.S. jobs.

2. Section 103 Grants Protect American and Global Health and Safety, Fostering Productive Relationships with our Partners Abroad

Throughout the last section of this testimony I have made a brief case for the national and global interests at stake in each of these programs as they are supported through section 103 grants in the CAA. In this section I will make the case more thoroughly that these grants – and much of EPA's international priorities – are not only worthy of support but critically necessary given the kinds of problems the United States faces in the world today. The heart of H.R. 4255 is a concern that the EPA "shouldn't be

spending taxpayer dollars on foreign efforts."[10] The assumption is that money spent under this program in foreign institutions only benefits foreign interests. Nothing could be further from the truth. While I do think we have obligations to help those suffering from environmental problems abroad, a compelling case for these grants can be made without such appeals based on of the abundant evidence that foreign assistance grants benefit our own citizens and our national interests.

a. Protecting the health and safety of Americans.

Funding for studies and projects abroad directly help to protect the health and safety of Americans. EPA's international grants address transboundary and global contaminants that pollute the air we breathe and water we drink in the United States. Emissions from mercury, methane, and other contaminants do not stay put in the countries where they are emitted. As a result, these pollutants impact us here in the U.S., and it's necessary to address them, regardless of their source, for the sake of our own public health and economic growth.

For example, researchers at the University of Washington demonstrated that not only does air pollution over one continent influence air pollution over other continents, but also that reductions in air pollution in other countries will result in reduced mortality rates right here in America. Modeling which assumed various degrees of emissions reductions across different continents were used to quantify ranges of reduced mortality in other continents. So, while the study concludes that the highest impact on mortality rates comes from reducing domestic air pollution, as you would expect, it also shows significant mortality reductions in the United States based on emissions reductions in other countries.[11]

Reducing air pollution by 20 percent in East Asia would prevent hundreds of cardiopulmonary mortalities in North America annually. Similarly, reducing air pollution in a few other continents would prevent hundreds of annual mortalities from cardiopulmonary diseases in the U.S.. These are real lives which can be saved by preventing toxic air pollution from entering the atmosphere and crossing national boundaries at minimal cost.

By providing technical expertise, and coordinating with our allies to develop newer and better technologies, we are helping to clean up the air our children breathe, and protect the environment for ourselves and future generations. In fact, a large number of the grants that EPA has given are for international cooperation between scientists working in the U.S. and elsewhere to solve these problems together. As with research supported at the National Science Foundation, the bar is high to pay for these cooperative efforts as they are not designed simply to foment international relationships, but to bring together actors who may be uniquely capable of achieving a desired outcome even if they are in different countries. The U.S., and its partners, are the first to reap the rewards of these efforts, which would be less likely if the funding came from a competitor.

b. Meeting our foreign policy objectives.

EPA's foreign investments, like many similar programs administered through other agencies in the U.S. government, assist in meeting our nation's critical foreign policy objectives. For one, they help to create partnerships and build alliances with strategic priority countries and major emerging economies such as Indonesia, India, and Brazil that will contribute to strengthening our critical regional alliances.

Section 103 supports investments that improve air quality and reduce oil consumption by limiting exhaust emissions, optimizing fuel economy, improving mass transit, developing and adopting new vehicle and cleaner fuel technologies. For example the Partnership for Clean Fuels and Vehicles, a program supported through section 103, is an international partnership that promotes clean fuels and vehicle technologies. Reducing reliance on oil is good for everyone because it will stop the flow of oil money that sustains hostile and undemocratic regimes, which is a high priority for America's foreign policy and national security agenda.[12] Even with a firm commitment by the U.S. to this strategy – either through maximizing domestic oil drilling or increasing our capacity to generate renewable energy – unstable oil exporters can still be supported through exports to other countries. When the U.S. invests in reducing foreign oil imports abroad we work in concert with others rather than at cross purposes.

Efforts like these build good will for the United States across the globe. At this point no one could seriously defend the proposition that U.S. influence throughout the world is only a matter of military might. In fact, enabling high-risk communities, such as those some of these grants have served, in Africa and Eastern Europe, to deal with their own pollution problems can play an even more strategic role in furthering U.S. influence by fostering cooperation and spreading democratic ideals.

For example, the Clean Cookstoves initiative does more than prevent indoor air pollution, it reduces the vulnerability of women in conflict zones which, in turn, increases their social mobility. This is a fundamental element of democracy: creating a free, safe environment where anyone has a chance at success if they are willing to work for it. It is a core belief of our society that no one should be so hamstrung by their circumstance that they cannot have a good life. Bolstering economies through these investments and providing local jobs may help to reduce inequality and limit the exacerbation of conflict in key regions of the world.

These are not mere platitudes. The benefits of these programs to the countries that receive this form of assistance has been well documented. By participating in the Clean Cookstoves efforts, the EPA is helping address the approximately 3 billion people, or 40 percent of the world's population, who rely on wood, coal, charcoal or animal waste to cook their food using traditional fuel sources. These cookstoves emit black carbon pollution that is dangerous for human health and a major contributor to global warming. Replacing outdated cook stoves will save 800,000 lives annually, while keeping potent greenhouse gases out of the air that limit agricultural productivity around the world, including in the U.S.[13]

c. Ensuring competitiveness for U.S. companies.

U.S. assistance in setting pollution standards, establishing sustainable landscape practices, researching and testing new technologies, and installing clean energy with our foreign partners will provide opportunities for American companies and help advance their competitiveness abroad.

First, designing and implementing stronger pollution regulations requires buttressing technical capacity and improving monitoring, enforcement, and governance in developing countries through targeted grants and cooperative agreements. This capacity abroad helps us here at home. For example, Indonesia's capacity to monitor its own forests and protect public lands is severely limited when compared to a country like ours. Assisting this government with improved governance capacity and helping to build institutions to help regulate deforestation, promote sustainable land-use practices, and regulate pollution which will ensure that the numerous U.S. companies that rely on soy, cattle, and palm oil from Indonesia have a secure supply chain. Indonesia supplies half of the world's palm oil supply – the most traded and consumed oil for food – and quickly became the largest producer globally in the last several years

at the expense of loss of peatlands.[14] A study published in the Proceedings of the National Academy of Sciences found that from 2008-2011, 69 percent of palm oil conversion in the Indonesian province of West Kalimantan occurred at the expense of peat, even though there was a moratorium on production.[15] Indonsia must be able to develop this agricultural sector without endangering themselves and the rest of the world. Because peatlands are both a critical component of tropical forest stabilization and a source of long-term sequestration of greenhouse gases we can help our mutual interests by encouraging sustainable development of this resource.

Second, support for multilateral organizations that raise ambition for tighter pollution protection measures abroad will help to ensure that developing countries are applying similar standards that we do at home. That will help U.S. companies abroad, because equal regulation on air pollution creates a level playing field for American companies to be competitive when the manufacturers in other countries are being held to the same standards. The mobile sources technologies programs, mentioned above, help to achieve these goals.

Third, partnerships that develop new low-pollution technologies and energy generation can be applied here at home. Cooperative government-academic-industry agreements to jointly research and test technologies will require equipment that U.S. companies can supply, and U.S. university researchers can lead. Such cooperative endeavors can generate jobs at home. For example, in a report in 2009, the Center for American Progress and the Asia Society found that cooperation between the U.S. and China to accelerate development and deployment of carbon capture and sequestration technology could create as many as 940,000 direct and indirect jobs in the United States by 2022, while a business-as-usual scenario would only create 122,000 jobs in the same time period.[16]

d. Global challenges require global solutions.

Global problems, from toxic pollution that causes asthma in children and premature deaths to climate change, require global solutions. As Governor Romney said one week ago today on a questionnaire, when criticizing this administration's policies on reduction of greenhouse gases, "The reality is that the problem is called Global Warming, not America Warming."[17] Governor Romney is absolutely correct. We cannot solve these environmental and public health challenges alone. We succeed only if other countries succeed. And we can't walk away from the table where those global solutions are being sought either. That's why the U.S. has consistently invested in Section 103 grants across several administrations and has been a leader in major global public health and environment efforts: these are smart investments from the perspective of our own well-being.

We have used the same reasoning, to great effect, on other global problems that require not only a global solution, but one that benefits most from American leadership. Recall President Bush's Emergency Plan for AIDS Relief, or PEPFAR, which pledged $15 billion over five years in the global fight against the spread of AIDS. This program has been instrumental in distributing affordable drugs which reduce or eliminate the death sentence associated with the disease.

Similarly, the previously mentioned, Global Methane Initiative provides a forum for international cooperation to reduce methane and harness it as a source of clean energy by enhancing cooperative efforts through the private sector. Altogether, the Global Methane Initiative has reduced over 42 million metric tons of carbon dioxide equivalent and it's estimated that continued global effort to reduce methane emissions could achieve reductions of more than 1.5 billion metric tons of carbon dioxide equivalent, about the same as the annual emissions from more than 280 million cars.[18]

Methane, along with black carbon, hydrofluorocarbons (HFCs), and topospheric ozone are so-called "short-lived" climate pollutants.[19] When compared to the primary anthropogenic greenhouse gas, carbon dioxide, these shorter lived gases are much more potent and account for around one-third of global warming. Some of them are also potentially deadly. Each year millions of people die prematurely, and more are diagnosed from a high incidence of dangerous respiratory disease, from black carbon. They also accelerate melting of the Arctic and are responsible for extensive crop losses each year.

Regardless of one's views on the reality of climate change, addressing these non-CO2 pollutants is both cost-effective and yields multiple health and economic benefits beyond potential for lowering atmospheric temperatures. This year, a study published in *Science* by an international team of 24 scientists, led by NASA's Drew Shindell, estimated the effects of initiating 14 straightforward methane and black carbon control measures (out of approximately 400 possible options). Their analysis demonstrates that, if implemented in the next few years, these measures would avoid up to 4.7 million annual premature deaths worldwide, and increase crop yields annually by 30-135 million metric tons starting in 2030 and beyond, including 6.3 million tons in the U.S. alone. The costs for this suite of programs are minimal though the payoff is huge: reducing a metric ton of methane costs around $250, while the benefit ranges from $700-$5,000.[20]

For those who are concerned with global warming, rapidly implementing something that looks like the suite of measures considered in the Shindell paper yields critically important results: reducing total projected warming by half a degree Celsius by 2050. Given that the current internationally accepted goal is to try to stabilize temperature increase caused by humans at 2 degrees Celsius over pre-industrial levels, we can't

afford not to move forward with these measures given that the world has already warmed approximately one degree Celsius due to human activity. If we add to this effort appropriate CO2 mitigation measures, greenhouse gas reductions from reducing short-lived pollutants is locked in, as we can see from the table below.[21] Just as important, if we only pursued an aggressive CO2 reduction pathway without taking on short-lived pollutants we would not see as significant a reduction in temperature this century, along with the impacts caused by that temperature increase.

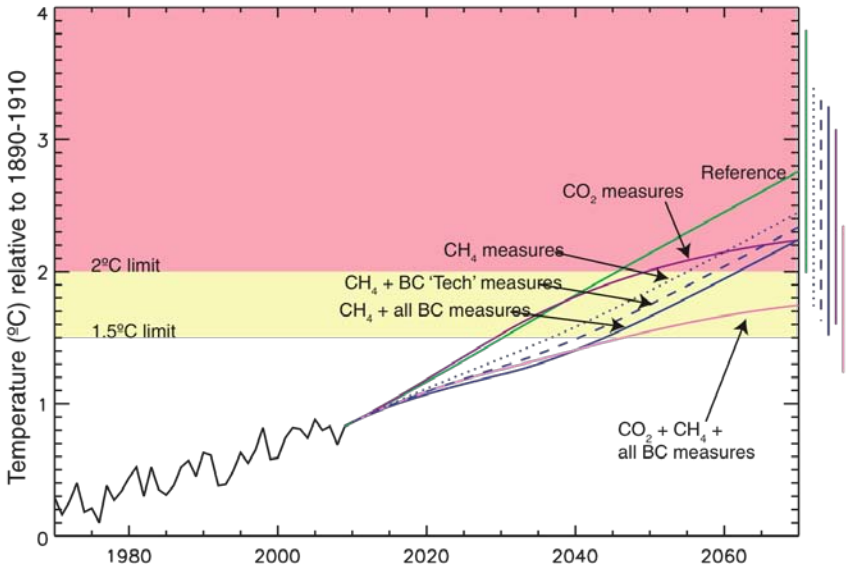


Fig. 1. Observed temperatures (*42*) through 2009 and projected temperatures thereafter under various scenarios, all relative to the 1890–1910 mean. Results for future scenarios are the central values from analytic equations estimating the response to forcings calculated from composition-climate modeling and literature assessments (*7*). The rightmost bars give 2070 ranges, including uncertainty in radiative forcing and climate sensitivity. A portion of the uncertainty is systematic, so that overlapping ranges do not mean there is no significant difference (for example, if climate sensitivity is large, it is large regardless of the scenario, so all temperatures would be toward the high end of their ranges; see www.giss.nasa.gov/staff/dshindell/Sci2012).

The measures studied in the Shindell paper include reducing methane leakage from coal mining, oil and gas production, long-distance gas transmission, municipal waste and landfills, wastewater, livestock manure, and rice paddies. The black carbon measures cover diesel vehicles, clean-burning biomass stoves, brick kilns, and coke

ovens as well providing modern cooking and heating to the world's poor. Clearly, many of the section 103 grants closely map onto these initiatives.

It will of course be difficult to globally implement something like this suite of initiatives, which makes the section 103 grants with our foreign partners all the more important. The approach of the 103 grants are appropriate to the challenge at hand. Unlike successful efforts to phase out particular pollutants – as we managed to do with CFCs using the Montreal Protocol – the sources of methane and black carbon are too numerous to effectively phase them out by targeting a more discrete number of industrial sources. What is needed is a more ambitious approach, sharing knowledge on multiple fronts, to build momentum toward a common end that will benefit everyone. This is the sort of approach that can be fomented by this grant program if it is allowed to continue under its current parameters.

This section of my testimony has presented a combined case for continuing foreign partners in the section 103 program. According to the EPA, international grants under this program only constitute one-tenth of one percent of EPA's overall annual grants budget. Nonetheless, these minimal investments yield multiple benefits and leverage additional resources towards our environmental, public health, development and national security goals.

3. Conclusion: The Moral Imperative of Smart Decision-Making

At the beginning of the last section I suggested that we have direct obligations to help those who are suffering in the world regardless of the benefits to our own citizens. At the end of the day, the success of every dollar of taxpayer money cannot be evaluated

only in a framework which reduces real needs in other countries to geopolitical chess pieces. Particularly in the case of global problems, such as health and climate change, there is a moral obligation to contribute to global solutions, especially given the contribution by the U.S. to these problems.

Successful prosecution of that argument however would take more time than I have been allotted today. For now, please allow me to invoke one final normative claim. Given the abundant benefits demonstrated here of cooperation with foreign partners in projects outside of the United States, and given the absolute necessity for international cooperation to adequately address problems that cannot effectively be stopped at anyone's borders, it would be irresponsible to pass this piece of legislation. I need not convince any of you that we have entered an era of tightened budgets across the board. This program may well have to be reduced until economic conditions change. But if this program is to be cut, this is not the way to do it. I have no doubt that the leadership team at EPA, and the experienced grants administrators of these programs, can come up with a better way of determining how to trim this budget than arbitrarily shaving off all international programs. In the interests of those the Clean Air Act was designed to protect, we need a scalpel, used with finesse, not a sledgehammer that could harm those incautious enough to use it.

Acknowledgments: I would like to thank Adam James and Rebecca Lefton for invaluable help with the preparation of this testimony.

Notes

[1] http://www.epa.gov/air/sect812/prospective2.html

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[2] Opening Statement of the Honorable Ed Whitfield, Subcommittee on Energy and Power and Subcommittee on Environment and the Economy, *Joint Hearing on The FY 2013 EPA Budget,* 112th Congress (February 28, 2012). (online at http://republicans.energycommerce.house.gov/Mediaifile/Hearings/Joint/20120228_EP_EE/HH RG-112-1F03-1Fl8-MState-W0004l3-20l20228.pdf).

[3] Letter from EPA Assistant Administrator Craig Hooks to the Honorable Fred Upton, August 3, 2011. Emphasis added.

[4]https://www.cfda.gov/?s=program&mode=form&tab=step1&id=1d601ed2ad50dabb4dd11eaa76bb7764

[5] http://www.epa.gov/oia/toxics/mercury/index.html

[7] http://www.epa.gov/oia/air/pcfv.html

[8] http://www.globalmethane.org/
[9] Letter from EPA Assistant Administrator Craig Hooks to the Honorable Fred Upton, August 3, 2011.

[10] Opening Statement of the Honorable Ed Whitfield, Subcommittee on Energy and Power and Subcommittee on Environment and the Economy, *Joint Hearing on The FY 2013 EPA Budget,* 112th Congress (February 28, 2012).

[11] S. C. Anenberg, et al., "Intercontinental Impacts of Ozone Pollution on Human Mortality," *Environmental Science & Technology*, 43(17), pp. 6482-6487.

[12] http://www.americanprogress.org/issues/green/report/2010/01/13/7200/oil-dependence-is-a-dangerous-habit/

[13] http://www.cleancookstoves.org/our-work/the-issues/health-impacts.html, http://www.cleancookstoves.org/our-work/the-issues/women-and-livelihood.html

[14] http://www.reuters.com/article/2012/07/16/us-indonesia-palm-idUSBRE86E0HV20120716

[15] K. M. Carson, et. al., "Committed carbon emissions, deforestation, and community land conversion from oil palm plantation expansion in West Kalimantan, Indonesia," *Proceedings of the National Academy of Sciences*, April 20, 2012, pp. 1073-1084.

[16] http://www.americanprogress.org/issues/green/report/2009/11/04/6926/cooperation-is-the-key/

[17] Zack Colman, "Romney: Humans contribute to climate change, more regulations not the answer," *The Hill*, September 4, 2012.

[18]http://yosemite.epa.gov/opa/admpress.nsf/e77fdd4f5afd88a3852576b3005a604f/5c929dbb962fea49852577af005cfe34!OpenDocument#area

[19] http://www.unep.org/ccac/ShortLivedClimatePollutants/tabid/101650/Default.aspx

[20] Drew Shindell, et. al., "Simultaneously Mitigating Near-Term Climate Change and Improving Human Health and Food Safety," *Science*, vol. 335, January 13, 2012, pp. 183-189.

[21] Table reprinted from Shindell, et. al., p. 184.