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THE ROLE OF OFFSETS IN CLIMATE LEGISLATION

HEARING

BEFORE THE

SUBCOMMITTEE ON ENERGY AND ENVIRONMENT

OF THE

COMMITTEE ON ENERGY AND COMMERCE
HOUSE OF REPRESENTATIVES

ONE HUNDRED ELEVENTH CONGRESS

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CONTENTS

	Page
Hon. Edward J. Markey, a Representative in Congress from the Commonwealth of Massachussetts, opening statement	1
Hon. Fred Upton, a Representative in Congress from the State of Michigan, opening statement	2
Hon. John Shimkus, a Representative in Congress from the State of Illinois, opening statement	5
Hon. John D. Dingell, a Representative in Congress from the State of Michigan, opening statement	6
Hon. Joe Barton, a Representative in Congress from the State of Texas, opening statement	7
Prepared statement	9
Hon. Gene Green, a Representative in Congress from the State of Texas, prepared statement	13
Hon. Michael C. Burgess, a Representative in Congress from the State of Texas, opening statement	14
Hon. Tammy Baldwin, a Representative in Congress from the State of Wisconsin, opening statement	14
Hon. Joseph R. Pitts, a Representative in Congress from the Commonwealth of Pennsylvania, opening statement	15
Hon. Rick Boucher, a Representative in Congress from the Commonwealth of Virginia, opening statement	16
Hon. Steve Scalise, a Representative in Congress from the State of Louisiana, opening statement	17
Hon. G.K. Butterfield, a Representative in Congress from the State of North Carolina, opening statement	17
Hon. Ralph M. Hall, a Representative in Congress from the State of Texas, opening statement	18
Hon. Jay Inslee, a Representative in Congress from the State of Washington, opening statement	18

WITNESSES

John Stephenson, Director, Natural Resources and Environment, Government Accountability Office	19
Prepared statement	22
Gary Gero, President, Climate Action Reserve	44
Prepared statement	46
Emily Figdor, Federal Global Warming Program Director, Environment America	59
Prepared statement	61
Graeme Martin, Manager of Business Development, Environmental Products, Shell Energy North America	70
Prepared statement	72
Stuart Eizenstat, on Behalf of The Forest Carbon Dialogue	81
Prepared statement	84
Michael Wara, Ph.D., Assistant Professor, Stanford Law School	95
Prepared statement	97

THE ROLE OF OFFSETS IN CLIMATE LEGISLATION

THURSDAY, MARCH 5, 2009

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON ENERGY AND ENVIRONMENT,
COMMITTEE ON ENERGY AND COMMERCE,
Washington, DC.

The subcommittee met, pursuant to call, at 9:34 a.m., in Room 2322, Rayburn House Office Building, Hon. Edward J. Markey [chairman of the subcommittee] presiding.

Present: Representatives Markey, Inslee, Butterfield, Matsui, McNerney, Dingell, Boucher, Green, Capps, Gonzalez, Baldwin, Matheson, Barrow, Upton, Hall, Whitfield, Shimkus, Pitts, Sullivan, Burgess, Scalise and Barton.

Staff Present: Matt Weiner, Legislative Clerk; Ben Hengst, Senior Policy Analyst; Melissa Bez, Professional Staff; Joel Beauvais, Counsel; Lindsay Vidal, Press Assistant; Peter Spencer, Minority Professional Staff; Andrea Spring, Minority Professional Staff; Amanda Mertens Campbell, Minority Counsel; Garrett Golding, Minority Legislative Analyst.

OPENING STATEMENT OF HON. EDWARD J. MARKEY

Mr. MARKEY. Good morning.

The basic concepts behind carbon offsets is quite simple. If you could achieve global warming pollution reductions outside of an emissions cap at a lower cost than can be achieved than under the cap, then you can get credit for doing so. The theory is that you save money, and the atmosphere doesn't know the difference.

That is the theory, but in practice offsets turn out to be one of the more challenging aspects of designing effective climate legislation. On the one hand, offsets have the potential to meaningfully reduce compliance costs. Unlike price caps they can do that while achieving needed emissions reductions. As a result, offsets can act as a bridge, allowing us to take on tougher near-term emission reduction targets than might otherwise be possible. That can give us time to develop the low-carbon technologies that we need. Offsets can also provide an opportunity for key stakeholders.

Outside the energy and industrial sectors like farmers and foresters to get in the game on climate change. They can help fund activities like tropical forest conservation that have environmental benefits going beyond climate change. And finally, a properly designed offset problem can provide a powerful lever to get major developing countries to take action on climate change.

For all these reasons offsets play a key role in the blueprint for legislative action recently put forward by the U.S. Climate Action Partnership, which, as you all know, includes a range of leading U.S. businesses and environmental organizations.

Offsets are a part of every existing cap-and-trade system. They are also a part of virtually every piece of proposed climate legislation, including my iCAP bill that I introduced last year.

Having said all that, offsets raise a number of real concerns that must be addressed. The first is the risk that some offsets could turn out to be hot air. Several of our witnesses today have testified that this has happened under the Kyoto Protocol's clean development mechanism. It surely is happening in the unregulated voluntary carbon market, as I learned last Congress when I heard the first congressional hearing on that market in the Select Committee on Energy Independence and Global Warming.

If offsets fail to deliver real reductions in global warming pollution, they will compromise the emissions cap. That is unacceptable given the urgency of the climate crisis. There should be no debate that if we are to include offsets in climate legislation, they must be subject to conservative science-based standards. Rigorous monitoring and verification requirements must also be applied.

We should be every bit as concerned with offset quality as we are with enforcement of pollution controls. For that reason I strongly support the concept of an independent science advisory committee to oversee the development, implementation and periodic updating of an offsets program.

Offset quality isn't the only thing at stake here. If we rely too heavily on offsets, we will not drive the technology transformation that we need. Necessity is the mother of invention. If we dull the incentive for innovation, we will not get the deep cuts in emissions that science tells us we need. We will also miss a crucial opportunity. If we don't spark a clean energy revolution here in America, we will be left behind in the global competition for the clean-tech market.

For all these reasons we need to strike a balance between strong targets and timetables for emission reductions and an appropriate but limited role for offsets in helping to meet them. These are complex issues, but I believe that they can be addressed in a way that strikes the right balance. We have an outstanding panel here this morning to help us to do just that. We welcome them here today.

Mr. MARKEY. And let me turn and recognize the Ranking Member of the subcommittee, the gentleman from Michigan Mr. Upton.

OPENING STATEMENT OF HON. FRED UPTON

Mr. UPTON. Well, thank you, Mr. Chairman. I, too, want to thank our witnesses for joining us this morning.

Cap-and-trade plans that we have seen so far rely to varying degrees on carbon assets, both international as well as domestic. For example, USCAP, who testified before the committee a month ago, is calling for a 1.5 billion metric ton of domestic and 1.5 billion metric tons of international offsets. The theory behind those offsets is that they decrease emissions from uncapped sectors, allowing greater emissions from capped sectors. In theory this is a zero-sum game.

In 2008, the offset market in developing countries derived from the U.N. Framework on Climate Change was over $12 billion, and these offsets have been subject to criticism on the grounds that projects have not achieved real emission reductions. The role of offsets in climate change legislation could mean a multibillion-dollar windfall for China and other countries that won't necessarily be subject themselves to a cap on carbon. In exchange for those billions, there may not be any real emission reductions.

It defies reality that we are even considering spending money on offsets to offshore countries as our own economy is certainly hemorrhaging, particularly in Michigan. We should be investing in our own infrastructure here at home.

Last year Congress got a taste of what the carbon offset market was all about. The CAO of the House cut an $89,000 check out of the taxpayers' checkbook to buy carbon credits, and some of that money went to farmers in North Dakota for tilling practices that apparently they were already using. According to the Center for American Progress, a group that strongly supports climate legislation, it didn't change much behavior that wasn't going to happen anyway. It just demonstrated why offsets are controversial and possibly pointless. That is a waste of taxpayer money.

In conclusion, there are a number of problems with carbon offset markets both in the U.S. and abroad that need to be examined and addressed. If we are relying on offsets, we must ensure that the money spent on offsets is having a real tangible and verifiable environmental benefit that would not have otherwise occurred. Seeing the issues that we have had with our voluntary domestic carbon market, I can only imagine how these issues will be compounded when the value of potential offsets increases and we are relying on verifying offsets in the developing world.

I look forward to the testimony today, and I yield back.

Mr. MARKEY. The gentleman's time has expired. The Chair recognizes the lady from California Mrs. Capps for an opening statement.

Mrs. CAPPS. Thank you, Mr. Chairman, but in the interest of more question time, I will pass.

Mr. MARKEY. The Chair recognizes the gentleman from Utah Mr. Matheson.

Mr. MATHESON. I will waive as well.

Mr. MARKEY. The Chair recognizes the gentleman from Georgia Mr. Barrow.

Mr. BARROW. I will waive.

Mr. MARKEY. The Chair recognizes the gentlelady from California Ms. Matsui.

Ms. MATSUI. Thank you, Mr. Chairman. I am very pleased to be here today, and thank you for your continued focus on climate change and your efforts to craft a comprehensive bill.

I would like to also thank today's participants and panelists. We all appreciate your time and expertise on these matters. And I will only take a minute so you can get to your important testimony.

I am glad that we are here to explore the concept of offsets. I feel that this idea has merit and could be an effective tool in order to reduce harmful greenhouse gas emissions; however, I look forward to hearing the true facts today. While offsets could be a way for our

Nation and our planet to reduce emissions, I want to make sure that any offset provisions truly work. I want to make sure that we are actually helping our planet and not simply moving the goalposts.

In California we have made it very clear that all offsets must be real, permanent, quantifiable, verifiable, enforceable and additional. These should be Federal requirements as well. I strongly believe that offset projects must have rigorous scientific backing and actually provide a quantifiable benefit to the planet. I hope our witnesses today can help us all understand how offsets can help and potentially hurt our legislative efforts.

With that, once again, Mr. Chairman, thank you for highlighting this important issue. I yield back.

Mr. MARKEY. The gentlelady's time is expired.

The Chair recognizes the gentleman from Illinois Mr. Shimkus.

Mr. SHIMKUS. Thank you, Mr. Chairman.

First, a question. Do you know when the cameras in this committee room will get fixed? I have never known you to be camera shy. This hearing and these climate change hearings are too important for the cameras in this committee room not to work so that the public in this country can see the debate on these issues on climate change. And this is not the first hearing we have had where the cameras have not worked. Can you tell us when the committee leadership might get around to fixing these cameras?

Mr. MARKEY. Well, honestly I did not know that the cameras weren't working.

Mr. SHIMKUS. I knew you didn't know. But if you look right there, they are turned facing each other.

Mr. MARKEY. I can see that right now, and it looks like they are very interested in each other. The good news is that there is an audiocast.

Mr. SHIMKUS. That is not the same.

Mr. MARKEY. I agree that is not the same. Let us just agree on this, okay. Especially in a carbon offset hearing this is very important, because the interest in this is about as high as watching grass grow. And literally that is what this is about; it is about where we can watch grass gross and trees grow.

Mr. SHIMKUS. After you hear my opening statement, you will have a different opinion.

Mr. MARKEY. Honestly, you have drawn my attention to it. After 22 years as the Ranking Member on the Telecommunications Committee, I have a high, high interest in ensuring that there is full video coverage transmitted around the world, and hopefully into the cosmos, so it can be preserved forever and circulating for eons, this hearing. And I promise you that I will do my best to find a television technician to be able to fix this camera problem which I did not know existed. And I am glad that you brought it to my attention, and we will do it as quickly as possible.

Mr. SHIMKUS. Thank you, Mr. Chairman.

This was a debate on policy. My time is out, but can I——

Mr. MARKEY. I can grant you an opening statement offset, okay, for the inquiry which you made. And the Chair is willing to recognize the gentleman for 2 minutes.

OPENING STATEMENT OF HON. JOHN SHIMKUS

Mr. SHIMKUS. Thank you, Mr. Chairman, and I appreciate that. But no one is assuring my mine workers an offset on their jobs. And we can laugh all we want, but as we have shown, 1,000 mine workers lost their job the last time this House passed an air quality bill. One thousand. Peabody number 10, Kincaid, Illinois. Just check the records.

So we can joke all we want, but a climate change cap-and-trade provision is going to be deadly to the fossil fuel industry in this country, and that needs to be exposed publicly, and it needs to use a full capacity of C–SPAN to do that. And I wouldn't want to say there was an intentional use of not having C–SPAN coverage, but I will tell you it is unique that someone who has been so versed in using new media, that this is now, I think, the second climate change hearing where we haven't had coverage.

So, I mean, all kidding aside, I am taking this debate very seriously because I have seen the job loss and job dislocation. And I want to highlight this is part of the hypocrisy index that we are seeing coming from this congressional leadership and this administration. First they want to cut the deficit in half first term, and they add $1.5 trillion to the national debt in 6 weeks. Then they don't want to accept, and the President will not sign, bills that have earmarks; however, he is probably going to sign this omnibus bill that has 9,000 earmarks. I think there is some hypocrisy.

Finally, as it relates to this provision and this bill, the President promises 95 percent tax cut for all Americans, but climate change in his budget will create a tax increase on average citizens on average of $700 a year to $1,200 a year. Now, that dwarfs to the $400 tax cut that we just have gotten in the stimulus bill. So there is a hypocrisy here.

As I said last year on this debate, the congressional Majority that attacks NYMEX, a trading floor for distortion of the cost of energy, are now going to empower a new exchange on climate and carbon to do this. So I think this is very serious. Again, I would challenge you to get your leadership to get this on C–SPAN so we can fully inform the public.

I yield back my time.

Mr. MARKEY. I thank the gentleman.

Just a little historical background on the whole issue of C–SPAN. This was an issue that was raised by Albert Gore and myself and others back in 1978 and 1979 with Speaker O'Neill, who had an initial reluctance to broadcast these hearings. But having been pressed by a small number of us that really wanted to see televised congressional deliberations, he acceded to that request. It took 3 years for the Senate to finally accept that as well, and they did so because of the amount of attention which the House received from the public coverage of the hearing. So since I was one of the initiators of the coverage, and the senior Members at that time were not interested in it, I can promise you that it is my intention, and I am sure Chairman Waxman's intention as well, that whatever technical problem exists be corrected as soon as possible. And we will do that. And I can give the gentleman my word on that.

Mr. SHIMKUS. Thank you, Mr. Chairman.

Mr. MARKEY. Let me turn then and recognize the gentleman from Texas Mr. Green.

Mr. GREEN. Mr. Dingell.

Mr. MARKEY. I am sorry, I did not see Mr. Dingell. The Chair recognizes the gentleman from Michigan Mr. Dingell.

OPENING STATEMENT OF HON. JOHN D. DINGELL

Mr. DINGELL. Well, I thank both of my colleagues, and I thank my friend from Texas, who is always a gentleman and gracious in all ways.

Mr. Chairman, thank you for holding this important hearing. I commend you for building a strong record and for making a strong case for swift and well-thought-out action on climate change.

It is crucial that we find a way to reduce greenhouse gas emissions to avoid dangerous harm to this planet. It is also crucial that we do so in a way that protects our economy, a very difficult task, but one which is doable with proper effort by this committee and by proper leadership from you and your colleagues here.

I have heard from industry that allowing some use of offsets is the best way to control the cost of a climate change program. With this statement I agree. I would note that EPA's analysis of the Lieberman-Warner bill bears this out. It projected that the use of offsets could decrease allowance prices by up to sevenfold if offsets were allowed and properly used.

Last year when my good friend Mr. Boucher and I put forward a draft comprehensive cap-and-trade bill, we included in the draft an offset program that would allow offsets to be used for up to 5 percent of each entity's compliance at the start of the program, increasing to up to 35 percent after 2025. I would note that this bill is available to this subcommittee as it goes about its business, and I would note that this bill, or the suggested draft, contains matters which are approved by both environmentalists and by industry. And indeed the draft is one which makes great good sense from the viewpoints of both sides.

Other groups, including USCAP, a coalition of industry and environmental groups have called for the greater use of offsets, particularly in the early part of the cap-and-trade program, to keep allowance prices at levels necessary to avoid economic harm to our economy and to our industries. I welcome and encourage this debate, and I urge this committee to consider the views of USCAP and others who believe that offsets are a useful and necessary tool. And in encouraging this debate, I do so because when Mr. Boucher and I introduced our draft, this is exactly the kind of feedback that we hoped to get.

It is also essential that the use of offsets maintains the integrity of emissions reductions. That is why our discussion draft would require that offsets be vigorously verified for quality and regularly assessed to ensure that they are quantifiable, permanent and enforceable. I urge the committee to keep this thought in mind, because there is a fine possibility here for rascality and misbehavior.

I will also note that in the prepared testimony today by our witness from GAO, Mr. John Stephenson, the Director of Natural Resources and Environment, the GAO encourages Congress to establish, one, clear rules for offset compliance; two, procedures to ac-

count and compensate for uncertainty; three, a standardized registry for tracking the creation and ownership of offsets; and four, procedures for amending the offset rules as new information becomes available.

The draft submitted by Mr. Boucher and I achieved all of these recommendations because we had great apprehensions about this. And I encourage members of this committee to explore the carbon offset program that we have set forward when considering cap-and-trade legislation in this Congress. I look forward to hearing from our witness today as we explore this important issue in more depth.

Thank you Mr. Chairman.

Mr. MARKEY. The gentleman's time has expired. The Chair recognizes the gentleman from Texas Mr. Barton.

OPENING STATEMENT OF HON. JOE BARTON

Mr. BARTON. Thank you, Mr. Chairman, and thank our witnesses for being here today. This is an important hearing, the role of offsets in climate change legislation. I am not sure we need climate change legislation, as you well know, Mr. Chairman, but if we do need it, offsets might be something we could do theoretically if they work, which I don't think they do in Europe. And that is what we are going to talk about.

The European Union has been trying something called the Emissions Trading Scheme and their corresponding Clean Development Mechanism, and from what I can tell it has cost them jobs, and I think it has cost them credibility. Their sale of these credits seems to be almost impossible to verify, and they don't seem to actually be resulting in reducing emissions.

Last December the Government Accountability Office released a report about their ETS and CDM, international carbon offset scheme. I also, several years ago, along with Mr. Whitfield of Kentucky, asked the GAO to examine how well the ETS and the CDM actually controlled greenhouse gases and whether available information substantiates the net benefits of the program. Our intention and request in the GAO's assessment of their lessons from the international experience is that their experiences should apply to upcoming congressional deliberation of these carbon energy-rationing schemes. That is the purpose of your hearing today, and again I commend you for that.

What the GAO found is they could not substantiate—I want to repeat, could not substantiate—either emissions reductions or clear economic benefits, and that the negative economic effects could occur if the EU further reduced emissions allowances. This GAO report, in my mind, raises serious doubts about the effectiveness of any carbon emissions reduction scheme. If nothing else, the failure of the ETS and the CDM show that the Federal Government shouldn't have spent taxpayer dollars on uncertain and unverified benefits.

The GAO found that the CDM's impact on emissions reductions and sustainable development has been limited, and that it is, and I quote, nearly impossible, end quote, to ensure that international offset projects are additional to what would happen anyway absent the offset subsidy.

The use of carbon offsets in a cap-and-trade system can undermine the system's integrity because it is simply not possible to ensure that these credits represent a real, measurable and long-term reduction in emissions.

In a companion report the GAO found that there was wide variability in the quality of the offsets. The incomplete and conflicting data on the use of the offsets and the multitude of quality assurance mechanisms severely limited the market's transparency.

Just as an aside, Mr. Chairman, I am sure you know that the congressional purchase of offsets that Speaker Pelosi initiated several years ago has been suspended for the very reason that they can't guarantee that the offsets are really what they appear to be. What the American people need to know right now is not another murky financial market to lose their hard-earned dollars. Indeed, it would be more than ironic if we in the Congress this year have a hand in creating a derivatives market for carbon offsets on the heels of what I consider to be a total meltdown that we have just seen in the world of financial derivatives.

Aside from the financial concerns, if the goal of a cap-and-trade tax plan is to reduce greenhouse gas emissions, the GAO found the use of offsets could actually undermine achievement of emission reduction goals and delay technological development. In the European Union with its costly cap-and-trade tax scheme and offsets market, it decreased the CO_2 emissions on paper by 0.3 of 1 percent. In contrast, here in the United States, where we don't do any of that, our CO_2 emissions have been reduced by double the amount of 0.6 of 1 percent.

Since the GAO report appeared on the scene, I have heard a lot of backpedaling and sugarcoating from proponents of the cap-and-trade regime, Europeans and Americans alike. All of a sudden they say this ETS/CDM scheme is just a pilot program, or it is just a dress rehearsal. Proponents claim that now that the EU countries have learned their lessons, they really will get reductions in CO_2, and they really will have something to show their citizens after they spend all their money on the past offsets and allowance program.

This PR campaign to greenwash the failure of the ETS and CDM further underscores concerns that we should have about not following Europe's course as it creates a potential economic disaster for its citizens. I guess, Mr. Chairman, you could say I am undecided about the benefits of this particular scheme, and I do really appreciate you holding a hearing on it.

Mr. MARKEY. I thank the gentleman. I thank the gentleman for keeping an open mind on this issue. Thank you.

[The information follows:]

The Honorable Joe Barton
Opening Statement
Subcommittee on Energy & Environment
"The Role of Offsets in Climate Legislation"
March 5, 2009

The European Union and the United States have the largest bilateral trade relationship in the world. The size and importance of these trade ties make the EU and the US the key players in the global trading system. Trade between the US and Europe encourages growth in our economies and offers great potential for small businesses and established corporations alike to prosper. Where this trade relationship fails is when Europe tries to export their expensive and ineffective failure to our shores. The Emissions Trading Scheme ("ETS") and corresponding Clean Development Mechanism ("CDM") cost the EU jobs and credibility. Their reliance on the sale of unverifiable and unsuccessful offsets – the topic of today's hearing – must be a lesson learned and not repeated in the United States.

Last December the Government Accountability Office released a report about the EU's ETS and the CDS, an international carbon offset scheme. In July 2007, I, along with Mr. Whitfield from Kentucky asked GAO to examine how well the ETS and the CDM actually control greenhouse gases and whether available information substantiates the net benefits of the programs. Our intention in requesting GAO's assessment of lessons from the international experience is that their experiences might apply to upcoming Congressional deliberation of carbon-energy rationing schemes. And here we are.

What the GAO found is that they could not substantiate either emissions reductions or clear economic benefits, and that negative economic effects could occur if the EU further reduced emissions allowances. The GAO report raises serious doubts about the effectiveness of any carbon emissions reduction scheme. If nothing else, the failure of the ETS and CDM shows that the federal government certainly shouldn't spend taxpayer dollars on uncertain and unverified benefits until critical questions are fully answered.

The GAO found that the CDM's impact on emissions reductions and sustainable development has been limited and that it is "nearly impossible" to ensure that international offset projects are additional to what would happen absent the offset subsidies. The use of carbon offsets in a cap-and-trade system can undermine the system's integrity, because it is not possible to ensure that every credit represents a real, measurable, and long-term reduction in emissions.

In a companion report, the GAO found that there was wide variability in quality of the offsets sold in the U.S. voluntary market. The incomplete and conflicting data on use of the varied offsets and the multitude of quality assurance mechanisms severely limited the market's transparency. What the American people need right now is not another murky financial market to lose their hard-earned dollars. Indeed it would be more than ironic if we in Congress—this year—have a hand in creating a derivatives market for carbon offsets on the heels of the total meltdown we have just seen in the world of financial derivatives.

Aside from the financial concerns, if the goal of a cap-and-tax plan is to reduce greenhouse gases, the GAO found that the use of offsets could actually undermine achievement of emissions reduction goals and delay technological development. In 2007, the EU, with its costly cap-and-tax scheme and offsets market decreased its CO2 emissions by 0.3%. In contrast, the United States, with no formal cap-and-tax scheme, and no costly and unverifiable offsets to push, reduced its CO2 emissions by 0.6%.

Now, ever since the GAO report appeared on the scene I have heard a lot of backpedaling and sugarcoating from proponents of a cap-and-tax regime, Europeans and Americans alike. All of a sudden this ETS/CDM scheme is spun as just a pilot program or a mere dress rehearsal. Proponents claim that now that the EU countries have learned their lessons they really will get reductions of CO2 and they really will have something to show their citizens after they spend all of their money on offsets and allowances. This PR campaign to greenwash the failure of the ETS and CDM further underscores my concerns that we should not follow Europe's course as it creates potential economic disaster for its citizens. I yield back.

Mr. MARKEY. The Chair recognizes the gentleman from Texas Mr. Green.

OPENING STATEMENT OF HON. GENE GREEN

Mr. GREEN. Thank you, Mr. Chairman. And I appreciate you not only having this hearing, but our series of hearings on climate change and the solutions we have.

Today's hearing reflects on the critical role that cost containment mechanisms must play in any congressional efforts to reduce greenhouse gas emissions. Many governmental and private-sector studies have concluded that efforts to reduce carbon emissions will have substantial costs to our economy. President Obama's 2009 budget, for example, assumes a cap-and-trade program that reduces greenhouse gases 83 percent below 2005 levels will generate $645 billion to the Treasury over 10 years. Any cap-and-trade program must include an honest discussion on how to reduce the regulatory cost of compliance for both businesses and consumers while protecting the environmental integrity of the program.

Most legislative proposals permit regulated entities to purchase carbon offsets or greenhouse gas emission reductions in one place to make up for the emissions elsewhere in lieu of reducing on-site emissions or purchasing additional emission allowances. Carbon offsets are currently utilized under the European Union's trading scheme, ETS, through the Clean Development Mechanism, CDM, and Kyoto program, permitting nations with binding emission limits and active emission reduction projects in developing countries without emission limits. The use experience of CDM provides a valuable insight into potential benefits and limits of carbon offsets with any U.S. climate program.

Most experts agree that carbon offsets to be effective must be additional, quantifiable, real and permanent. Disagreement lies in what defines these key terms and ensure that offsets aren't simply phantom reductions that can be gained by savvy entities or carbon market players. Congress must also pay careful attention on how to best structure the carbon offset approval and management process, establish offset limits and price volatility mechanisms, and encourage developing countries to transition from offsets to binding emission targets.

I look forward to our testimony today. I guess my concern is, coming from Houston, Texas, and the home of what used to be Enron, we watched a transmission and energy company turn into a trading company. And as my colleague from Texas mentioned, we are seeing the trading in financial services, actually the tail wagging your dog, in the same thing we could see this. And we have to get it right. I don't want 5 or 10 years from now a committee in Congress sitting there and saying, Okay, who voted for the 2009 bill, similar to what we did to the 1999 bill, to free up the flexibility that we are seeing in the financial industry and see all the problems it is wreaking havoc on.

So, Mr. Chairman, I appreciate it. We need to learn from the misexperience of the European example and see if we can make it work. And I yield back my time.

Mr. MARKEY. The gentleman's time is expired. The Chair recognizes the gentleman from Texas Mr. Burgess.

OPENING STATEMENT OF HON. MICHAEL C. BURGESS

Mr. BURGESS. I thank the Chairman.

You know, a simple trip to the search engine of choice on the Internet and typing in the phrase "carbon offset fraud" will give you tens of thousands of Web sites, news stories, YouTube clips, all discussing the idea that carbon offset programs are indeed, as Chairman Dingell alluded to, a fertile field for dishonest minds. So I am interested to hear from our witnesses today and hear what they have to say about including the carbon offset programs in the committee's cap-and-trade legislation.

Now, according to the August 2008 report from the General Accountability Office, which has been referenced several times this morning, over 600 organizations develop, market or sell offsets in the United States with a wide range of prices, transaction types and projects. One thing that remains constant among the 600 organizations is the lack of the ability to verify the validity and effectiveness of these offset plans. In fact, we are still trying to verify the validity of the carbon indulgences purchased by the House of Representatives in November of 2007.

I understand that the offsets have to be, as has been earlier pointed out, real surplus, quantifiable, verifiable and enforceable to be credible, but I frankly cannot understand why they also need to be international. How are international carbon offsets useful when the carbon producing sources are local? In my area, the Dallas-Fort Worth area of Texas, we have some of the most significant traffic congestion in the world, and as a consequence are brushing up against nonattainment for air quality standards several days a year. We work on these issues locally in order to improve air quality for the people who live and work in the area, but we certainly don't throw a tarp over grass clippings in a Third World country to excuse the emissions that we create from sitting in traffic on Interstate Highway 35 through the center of my district. I am going to maintain a healthy skepticism of any legislation or company that advocates for an international carbon offset program.

Mr. Chairman, in just the brief time I have remaining, I would just like to add my concern to that of Mr. Shimkus. We are fixing to pass one of the largest tax increases on the middle class and lower levels of earning in this country, and I think it is only appropriate the American people be able to see what we are doing under the cover of darkness.

I yield back.

Mr. MARKEY. The gentleman's time is expired. The Chair recognizes the gentleman from Texas Mr. Gonzalez.

Mr. GONZALEZ. Waive opening.

Mr. MARKEY. The Chair recognizes the gentlelady from Wisconsin Ms. Baldwin.

OPENING STATEMENT OF HON. TAMMY BALDWIN

Ms. BALDWIN. Thank you, Mr. Chairman.

Today's hearing brings us to the core of one of the issues we will be tackling in a cap-and-trade bill. Offsets are important to a greenhouse gas reduction program, both because of the cost-containment benefits and the environmental benefits that occur even beyond those of emissions reductions. Given my State's significant

industrial base, along with our wealth of forested and agricultural lands, Wisconsin has a substantial interest in a successful offset program.

Offsets have the ability to lower our compliance costs, provide investments in the resources of our State and region, and ensure that we meet greenhouse gas emissions targets. Specifically we must give serious consideration to investments and offsets projects such as those that capture methane from landfills, invest in agricultural conservation, implement energy-efficiency technologies, and protect or plant trees through various forestry projects.

With regard to the potential for increasing carbon sequestration through forestry and agricultural practices, earlier indications suggest that by extending rotations in Wisconsin's forests and continuous no-till of cultivated cropland, Wisconsin could provide about 16 million metric tons of additional carbon sequestration with a price of carbon at $20 per ton of CO_2. This amount would account for approximately 13 percent of Wisconsin's total emissions and could vary depending on many factors. Plus there are additional benefits that can be achieved through use of offsets: clean water, air quality improvement, watershed stabilization, biodiversity and wildlife habitat protection, and preservation of agricultural land and farming, to name just a few.

Let me conclude by saying that while an offset program is important, it can only be truly successful if emissions reductions are real, verifiable, additional, permanent and enforceable. I look forward to hearing how we can design a system that meets all of these criteria.

Thank you, Mr. Chairman. I yield back the balance of my time.

Mr. MARKEY. The gentlelady's time is expired. The Chair recognizes the gentleman from Pennsylvania Mr. Pitts.

OPENING STATEMENT OF HON. JOSEPH R. PITTS

Mr. PITTS. Thank you, Mr. Chairman. I would like to thank you for convening this hearing today on such an important issue.

Like all of us, I believe we should work to decrease the amount of greenhouse gas emissions into our atmosphere. Many of us are concerned, however, about the economic impact of legislation that could be passed to curb emissions, like a cap-and-trade bill. We are also concerned about the role of offsets that may be included in a possible cap-and-trade bill.

On September 18, 2008, Mr. Orszag, the present President Obama's OMB Director, testified that, quote, decreasing emissions would also impose cost on the economy. Much of those costs will be passed along to consumers in the form of higher prices for energy and energy-intensive goods, end quote.

I do not believe that we should pass a cap-and-trade bill that will harm our already damaged economy and those least able to withstand more economic pressure, regular Americans who are struggling to make ends meet during this recession.

In regard to offsets, there have been widespread reports that organizations are paying for reductions that do not actually take place. In addition, some offsets result in a reduction in emissions that would have taken place regardless of someone paying vast sums of money for the offset to occur. Former director of global

warming for the Sierra Club, Dan Becker, has been quoted saying, quote, on the one hand, there is potential benefit of educating people through offsets. On the other hand, if people view offsets like papal indulgences that allow you to continue to pollute, then it is probably not a good idea, end quote.

Therefore, as this committee considers climate change legislation, I believe it would be prudent for us to not only consider the economic impact of climate change legislation, but also each component's effectiveness.

I look forward to hearing our witnesses today, and I thank you, and yield back.

Mr. MARKEY. The gentleman's time has expired. The Chair recognizes the gentleman from Virginia Mr. Boucher.

OPENING STATEMENT OF HON. RICK BOUCHER

Mr. BOUCHER. Thank you very much, Mr. Chairman. And I want to thank our witnesses for taking part in our conversation today.

It is possible to create a program that reduces greenhouse gas emissions substantially and at the same time is not economically disruptive, but those two goals can only simultaneously be met if there is a sufficient availability of offsets operating outside the cap. Nowhere is that reality better illustrated than in the context of utilities that consume fossil fuels.

Fifty-one percent of electricity in the United States is coal-fired, and the technology to enable coal to be combusted without emitting carbon dioxide is still under development. And even if we accelerate the funding for the development of that technology, which I will be urging that we do as part of our cap-and-trade measure, it is estimated that the technology will not be fully deployed until about 2025.

If we require large reductions in emissions in the time between the effective date of the measure and that 2025 date, the utilities that are consuming coal, about half of all utilities today, would default to the next least expensive fuel, and that fuel is natural gas, a fuel that is already in short supply in this country. And if we had half of electric utilities defaulting to natural gas, there would be a tremendous spike to natural gas prices, and that would cause deep economic pain across the entire economy. At the present time 58 percent of American homes are heated with natural gas, and the range of industries from chemicals to agriculture and others are heavily natural-gas-dependent. True economic dislocation would occur.

The answer is to have a generous availability of offsets. And the legislation, which I joined with Chairman Dingell last fall in publishing on our committee's Web site, contains that reasonable offset availability.

I was pleased to note that the blueprint put forward by the USCAP group, and I know we will be hearing about that from our witnesses today, also contains an appropriate availability of offsets. As I recall their numbers, it is 1.5 billion tons both domestically and internationally on an annual basis. That would make sure that we can take carbon dioxide reductions in the near time, and that in doing so, we do not have national economic disruption.

Thank you, Mr. Chairman. I yield back my time.

Mr. MARKEY. The gentleman's time has expired. The Chair recognizes the gentleman from Louisiana Mr. Scalise.

OPENING STATEMENT OF HON. STEVE SCALISE

Mr. SCALISE. Thank you, Mr. Chairman.

I look forward to hearing from our panel as we discuss the role of climate change and offsets. I think the GAO report raises some serious concerns. Other reports have raised serious concerns about questions about cost-effectiveness and integrity of the European Union's Emissions Trading Scheme, as well as international carbon offset schemes. I am sure to those who stand to profit from the trading of offsets and the lucrative fees that would go along with it, the idea of some of these emissions trading exchanges might sound very interesting to them, but I think we also have to look at the other side and the cost that goes along with it.

To many of us the term "cap and trade" is nothing more than a code word for a tax increase on energy use. And I think if you look in the President's executive budget that was submitted last week, over $640 billion in new taxes are expected to be created from a cap-and-trade scheme. And what does this mean to our economy? What does this mean to our job market at a time when we surely don't want to be hurting our economy and sending more jobs overseas?

I think all of these issues need to be considered in the broader context of, number one, the effectiveness of studying the European model, and I am sure we are going to be hearing a lot about that, but also the adverse effects on our economy, as well as to every consumer in this country that may think they are not going to be paying higher taxes when they realize that that $640 billion in new taxes is going to be hitting those very middle-class people and lower-middle-class people, people at the bottom of the rung, who can least afford to pay it. So I think we need to consider all of these in the broader context as we are discussing this issue, and look forward to hearing the rest of the panel discuss those as well.

Yield back.

Mr. MARKEY. The gentleman's time has expired. The Chair recognizes the gentleman from North Carolina Mr. Butterfield.

OPENING STATEMENT OF HON. G.K. BUTTERFIELD

Mr. BUTTERFIELD. Thank you very much, Mr. Chairman, for convening this important hearing today, and I certainly thank the six witnesses for their anticipated testimony.

Mr. Chairman, I agree with my colleagues that it is appropriate for us to begin to have this conversation and to develop a generous system of offsets that would be real, that would be verifiable, permanent, efficient and effectively monitored. My desire to support this concept stems not only from a desire to provide cost-containment measures in the bill, but also to provide an economic opportunity for districts like mine, which I refer to as an offset-rich district, in northeastern North Carolina.

Methane digestion on large livestock operations could be a credible and useful offset in not only removing a harmful gas from the air, but also using methane for electricity on the farm and eventually on the grid. There are nearly 350,000 hogs and pigs being

raised in my district, and this represents a clear, clear opportunity for these farmers to become part of the green solution.

North Carolina has extensive forestry resources with nearly 60 percent of our State's 33 million acres considered to be forestland. Including foresting provisions into an offset regime will be duly beneficial. It will have two benefits, because the potential includes not only reducing deforestation emissions, but also the potential for increased sequestration through aforestation, reforestation and forest management. And so this is an important conversation, and I thank you, Mr. Chairman, for your leadership on this incredibly important issue.

I yield back.

Mr. MARKEY. I thank the gentleman.

The Chair recognizes the gentleman from Texas Mr. Hall.

OPENING STATEMENT OF HON. RALPH M. HALL

Mr. HALL. I thank you, Mr. Chairman. And as we listen to these six folks here to give us their opinion and suggestions, I won't waste a lot of their time, because I will get right to the point on the role of offsets as a cost-control mechanism under the cap-and-trade regulatory scheme. I won't go into what it does to our economy; the energy needs, accumulation of debt, or, as the gentleman just spoke there, of new taxes. But Chairman Barton, former Chairman Barton, pretty well spoke my feelings on it. He said he had a questionable—at best he was questionable. Dr. Burgess said he had a lack of optimism.

I will just be plain about it. As I listen to this and how offsets is going to be sold on emissions trading exchanges and all that, I say, Mr. Chairman, to you, my friend, and a guy I admire and respect and differ with, I say the same thing that a loan officer from Prudential told me one time when I asked for a loan from one of my companies: I listen to your outrageous proposals with an open mind. That gets about as plain as I can say it, and I yield back my time.

Mr. MARKEY. I thank the gentleman very much. My goal is for us to make that loan possible, though. Just so you know, I am going to be working on that.

And the Chair recognizes the gentleman from Washington State Mr. Inslee.

OPENING STATEMENT OF HON. JAY INSLEE

Mr. INSLEE. Just two points. First, we are now starting a serious discussion of a cap-and-trade bill, and I think we will hear a lot of my friends across the aisle simultaneously talking about their desire to cut CO_2 emissions and their abject refusal to embrace a cap-and-trade bill. And I just hope that during this debate, those who do express a desire to deal with this issue will come forward with ideas about how to deal with it. You can't be something with nothing. We are putting forth a cap-and-trade bill which is an honest attempt to deal with this issue, and I hope that we can welcome positive ideas from the other side of the aisle.

The second point I would hope that our panelists could answer today is a fundamental question I have about offsets. If a polluting industry in the United States buys an offset to engage in a contract

an owner in a Brazilian forest not to cut down 100 acres of trees, to use the sequestration asset of those trees, how can we be assured that his neighbor or his other 100 acres just don't get cut down so we get no additional benefit? The only way I could see that this would actually be credible is if, in fact, we buy down the quota, if you will, of Brazil, where we essentially reduced the otherwise allowed CO_2 emissions, or a total deforestation acreage provision wherein we, in fact, get additional protection. I don't see any other way to do it, and I hope the panelists will address that issue. Thank you.

Mr. MARKEY. The gentleman's time has expired. The Chair recognizes the gentleman from Kentucky Mr. Whitfield.

Mr. WHITFIELD. Mr. Chairman, I will waive opening statement.

Mr. MARKEY. The Chair recognizes the gentleman from Oklahoma Mr. Sullivan.

Mr. SULLIVAN. I waive opening statement.

Mr. MARKEY. The Chair does not observe any other Members seeking recognition for the purpose of making an opening statement. We will turn to our witnesses.

Our first witness this morning is Mr. John Stephenson. He is the Director of Natural Resources and Environment at the United States Government Accountability Office. He has assisted Congress immensely over the years in various GAO investigations, including his recent reports on the voluntary carbon offset market and the Kyoto Protocol's Clean Development Mechanism. Thank you for joining us.

Mr. Stephenson, whenever you are ready, please begin.

STATEMENTS OF JOHN STEPHENSON, DIRECTOR, NATURAL RESOURCES AND ENVIRONMENT, GOVERNMENT ACCOUNTABILITY OFFICE; GARY GERO, PRESIDENT, CLIMATE ACTION RESERVE; EMILY FIGDOR, FEDERAL GLOBAL WARMING PROGRAM DIRECTOR, ENVIRONMENT AMERICA; GRAEME MARTIN, MANAGER OF BUSINESS DEVELOPMENT, ENVIRONMENTAL PRODUCTS, SHELL ENERGY NORTH AMERICA; STUART EIZENSTAT, ON BEHALF OF THE FOREST CARBON DIALOGUE; AND MICHAEL WARA, Ph.D., ASSISTANT PROFESSOR, STANFORD LAW SCHOOL

STATEMENT OF JOHN STEPHENSON

Mr. STEPHENSON. Thank you, Mr. Chairman, and Mr. Upton and other members of the subcommittee. I am here today to talk about the potential role of carbon offsets in climate change legislation. My testimony is drawn from two of our recently issued reports: one, Lessons Learned from Voluntary Carbon Offset Markets in the U.S.; and the other, The European Union's Mandatory Market Implemented under Kyoto Protocol's Clean Development Mechanism.

Mr. Dingell and Mr. Barton have already done a good job of summarizing those two reports, but I am going to do my take on it anyway. The existing U.S. market is considered voluntary because we do not yet have national limits or a cap on greenhouse gas emissions. The CDM, on the other hand, is a program that allows EU countries under the Kyoto Protocol to partially meet their emis-

sions targets by investing in offset projects in developing countries like China.

Our reports identify challenges with ensuring the credibility of offsets in both markets and matters for the Congress to consider as it moves forward in developing climate change legislation.

Carbon offsets are reductions of a greenhouse gas from an activity in one place to compensate for emissions occurring elsewhere. Because the cost of creating an offset can be less than that of requiring regulated industries to make reductions themselves, carbon offset can be a useful cost-containment mechanism in a mandatory emissions-reduction program. For example, a regulated coal-burning power plant might choose to invest in projects to reduce carbon emissions off site rather than make reductions itself or trade with another entity. However, the use of offsets, whether for voluntary or compliance purposes, presents numerous challenges.

First, carbon assets are difficult to characterize and evaluate since they can involve different activities, definitions, greenhouse gases, quality assurance practices and time frames. We found that this is particularly true in the voluntary offset market in the U.S., which is not regulated, lacks transparency and provides offset purchasers with limited evidence of a project's quality and integrity.

Second, ensuring the credibility of offsets is challenging because there is no reliable way to determine whether the underlying project is additional to a business-as-usual scenario. In other words, it is difficult, if not impossible, to know whether a project might have gone forward anyway. Because all offset projects involve estimating reductions in the future relative to projections of a business-as-usual condition, all estimates and projections are inherently uncertain.

Third, offsets involve environmental and economic tradeoffs. For example, offsets could lower the cost of the future U.S. cap-and-trade program, but could also undermine its effectiveness if the offsets do not represent real reductions. Our work has raised questions about the credibility of offsets in the voluntary market and identified cases where CDM offsets lack credibility. In the case of the CDM, offsets have provided cost containment for entities regulated by the EU cap-and-trade program by enabling them to use offsets for partial compliance with the program. However, the CDM's effects on emissions are uncertain because of challenges in ensuring the credibility of offsets. In addition, the project approval processes are lengthy and resource-intensive, which significantly limits the program scale and cost-effectiveness.

Nonetheless, an international offset program like the CDM can provide incentives for developing countries to participate in global efforts to reduce emissions. In fact, developing countries may not have signed Kyoto without the CDM. This is important because any meaningful effort to limit the harmful effects of climate change will require substantial international cooperation.

To the extent that the Congress chooses to develop a program that limits greenhouse gas emissions, allowing the use of carbon assets for compliance, it may wish to establish, one, clear rules about the types of offset projects that regulated entities can use for compliance, as well as standardized quality-assurance mechanisms for these allowable project types; two, procedures to account and

compensate for the inherent uncertainty associated with offset projects such as discounting or overall limits to the use of carbon for compliance. A standardized registry for tracking the creation and ownership of offsets will also be needed; and lastly, procedures for amending the offset rules, quality-assurance mechanisms and registry based on experience and the availability of new information over time.

The fact that the EU, even with extensive quality-assurance procedures, had credibility problems with some CDM offsets illustrates the potential for offsets to undermine the integrity of a cap-and-trade system. Given these challenges, it may be useful to consider the merits of offsets relative to other cost-containment mechanisms as we go forward.

Mr. Chairman, that concludes my statement. I will be happy to answer questions at the appropriate time.

Mr. MARKEY. Thank you, Mr. Stephenson, very much.

[The prepared statement of Mr. Stephenson follows:]

United States Government Accountability Office

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Testimony

Before the Subcommittee on Energy and Environment, Committee on Energy and Commerce, House of Representatives

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CLIMATE CHANGE

Observations on the Potential Role of Carbon Offsets in Climate Change Legislation

Statement of John Stephenson, Director
Natural Resources & Environment

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GAO-09-456T

March 5, 2009

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Highlights

Highlights of GAO-09-456T, a testimony before the Subcommittee on Energy and Environment, Committee on Energy and Commerce, House of Representatives

CLIMATE CHANGE

Observations on the Potential Role of Carbon Offsets in Climate Change Legislation

Why GAO Did This Study

Carbon offsets—reductions of greenhouse gas emissions from an activity in one place to compensate for emissions elsewhere—can reduce the cost of regulatory programs to limit emissions because the cost of creating an offset may be less than the cost of requiring entities to make the reductions themselves. To be credible, however, an offset must be additional—it must reduce emissions below the quantity emitted in a business-as-usual scenario—among other criteria.

In the U.S., there are no federal requirements to limit emissions and offsets may be purchased in a voluntary market. Outside the U.S., offsets may be purchased on compliance markets to meet requirements to reduce emissions. The Congress is considering adopting a market-based cap-and-trade program to limit greenhouse gas emissions. Such a program would create a price on emissions based on the supply and demand for allowances to emit. Under such a program, regulated entities could potentially substitute offsets for on-site emissions reductions, thereby lowering their compliance costs.

Today's testimony summarizes GAO's prior work examining (1) the challenges in ensuring the quality of carbon offsets in the voluntary market, (2) the effects of and lessons learned from the Clean Development Mechanism (CDM), an international offset program, and (3) matters that the Congress may wish to consider when developing regulatory programs to limit emissions.

View GAO-09-456T or key components. For more information, contact John Stephenson, (202) 512-3841, stephensonj@gao.gov.

What GAO Found

In an August 2008 report, GAO identified four primary challenges related to the United States voluntary carbon offset market. First, the concept of a carbon offset is complicated because offsets can involve different activities, definitions, greenhouse gases, and timeframes for measurement. Second, ensuring the credibility of offsets is challenging because there are many ways to determine whether a project is additional to a business-as-usual baseline, and inherent uncertainty exists in measuring emissions reductions relative to such a baseline. Related to this, the use of multiple quality assurance mechanisms with varying requirements may raise questions about whether offsets are fully fungible—interchangeable and of comparable quality. Third, including offsets in regulatory programs to limit greenhouse gas emissions could result in environmental and economic tradeoffs. For example offsets could lower the cost of complying with an emissions reduction policy, but this may delay on-site reductions by regulated entities. Fourth, offsets could compromise the environmental certainty of a regulatory program if offsets used for compliance lack credibility.

In a November 2008 report, GAO examined the environmental and economic effects of the CDM—an international program allowing certain industrialized nations to pay for offset projects in developing countries—and identified lessons learned about the role of carbon offsets in programs to limit emissions. While the CDM has provided cost containment in a mandatory emissions reduction program, its effects on emissions are uncertain, largely because it is nearly impossible to determine the level of emissions that would have occurred in the absence of each project. Although a rigorous review process seeks to ensure the credibility of projects, available evidence from those with experience in the program suggests that some offset projects were not additional. In addition, the project approval process is lengthy and resource intensive, which significantly limits the scale and cost-effectiveness of emissions reductions.

The findings from these two reports illustrate how challenges in the voluntary offset market and the use of offsets for compliance—even in a rigorous, standardized process like the CDM—may compromise the environmental integrity of mandatory programs to limit emissions and should be carefully evaluated. As a result of these challenges, GAO suggested that, as it considers legislation that allows the use of offsets for compliance, the Congress may wish to consider, among other things, directing the establishment of clear rules about the types of projects that regulated entities can use as offsets, as well as procedures to account and compensate for the inherent uncertainty associated with offset projects. Further, GAO suggested that the Congress consider key lessons from the CDM, including the possibility that, (1) due to the tradeoffs involving cost savings and the credibility of offsets, their use in mandatory programs may be, at best, a temporary solution to achieving emissions reductions, and (2) the program's approval process may not be a cost-effective model for achieving emission reductions.

Mr. Chairman and Members of the Subcommittee:

I am pleased to be here today to provide observations and matters for congressional consideration on the potential role of carbon offsets in climate change legislation drawn from two of our previously issued reports.[1] As the Congress and this Subcommittee consider legislation to limit greenhouse gas emissions, the potential role of carbon offsets—reductions or avoidances of greenhouse gas emissions from an activity in one place to compensate for emissions occurring elsewhere—is a critical issue that could influence the economic and environmental outcomes achieved through climate change legislation. Carbon offsets can be an important cost-containment mechanism in policies to limit greenhouse gas emissions because the cost of creating an offset may be less than the cost of requiring regulated entities to make the reductions themselves. However, ensuring the credibility of carbon offsets poses challenges because of the inherent uncertainty in measuring emissions reductions relative to a projected business-as-usual scenario.

In recent years, major scientific bodies such as the Intergovernmental Panel on Climate Change and the National Academy of Sciences have concluded that human activities, including the combustion of fossil fuels, industrial and agriculture processes, landfills, and some land use changes, are significantly increasing the concentrations of greenhouse gases in the atmosphere and, in turn, global temperatures. Specifically, these activities have increased the amount of carbon dioxide and other greenhouse gases—including methane, nitrous oxide, and several synthetic gases—in the atmosphere. This warming will cause significant changes in sea level, ecosystems, and ice cover, among other impacts. In recent years, key scientific assessments have underscored the importance of reducing or stabilizing emissions of greenhouse gases to mitigate the adverse effects of climate change.

Most of the efforts to limit greenhouse gas emissions under consideration in the United States generally focus on market-based programs—such as a cap-and-trade system or a tax—that would create a price on greenhouse gas emissions. In general, under a cap-and-trade program, the government

[1]GAO, *Carbon Offsets: The U.S. Voluntary Market is Growing, but Quality Assurance Poses Challenges for Market Participants*, GAO-08-1048 (Washington, D.C.: Aug. 29, 2008), and GAO, International Climate Change Programs: *Lessons Learned from the European Union's Emissions Trading Scheme and the Kyoto Protocol's Clean Development Mechanism*, GAO-09-151 (Washington, D.C.: Nov. 18, 2008).

would limit the overall amount of greenhouse gas emissions from regulated entities. These entities would need to hold allowances for their emissions, and each allowance would entitle them to emit a specific amount of a greenhouse gas. Under such a program, the government could sell the allowances, give them away, or some combination of the two. Regulated entities that find ways to reduce their emissions to below their allowed limit could sell their excess allowances to regulated entities that emit more than their limits, effectively creating a market for allowance trading and establishing a price for a ton of emissions based on supply and demand. A cap-and-trade system could allow regulated entities to purchase offsets in lieu of purchasing additional allowance or reducing emissions themselves.

Currently, carbon offsets are generated, bought, and sold in two types of markets. In markets such as the United States, which does not have binding limits on emissions, the market is referred to as a voluntary market. Conversely, in the European Union's Emissions Trading Scheme (EU ETS), a program to limit emissions of carbon dioxide from certain industry sectors, the market is referred to as a compliance market because regulated entities can use a limited number of carbon offsets to meet their regulatory limits on emissions. Under the EU ETS, regulated entities use offsets generated through the Clean Development Mechanism (CDM), a program under the Kyoto Protocol that allows countries with binding limits on emissions to implement projects that reduce or avoid emissions in a developing country that does not have a binding target under the Protocol. CDM projects earn credits, each equivalent to 1 metric ton of carbon dioxide that an industrialized country sponsoring the project can sell or use for compliance with targets under the Protocol. These credits are known as Certified Emissions Reductions (CERs). The United States has not ratified the Kyoto Protocol and is therefore not a source or purchaser of CERs.

My testimony today draws observations from two previously issued GAO reports that characterized the U.S. voluntary carbon offset market and identified lessons learned from international climate change programs, including the CDM. Specifically, this testimony summarizes our prior work related to (1) challenges in ensuring the quality of offsets in the voluntary market, (2) the effects of and lessons learned from the Kyoto Protocol's CDM, and (3) matters for congressional consideration included in those reports that may merit consideration in the development of climate change policy.

Our work related to voluntary offset market is based on analysis of literature and data and interviews with stakeholders, including offset providers, third party verifiers, and other participants in the voluntary market. To identify the lessons learned from the CDM, we worked with the National Academy of Sciences to recruit 26 experts based on their experience and expertise with international climate change programs and their knowledge of the U.S. policy development process. We gathered the experts' opinions through a questionnaire, interviewed stakeholders, and reviewed available information. We conducted our work in accordance with GAO's Quality Assurance Framework, which requires that we plan and perform each engagement to obtain sufficient and appropriate evidence to meet our stated objectives and to discuss any limitations in our work. We believe that the information and data obtained, and the analyses conducted, provided a reasonable basis for the findings and conclusions in these reports.

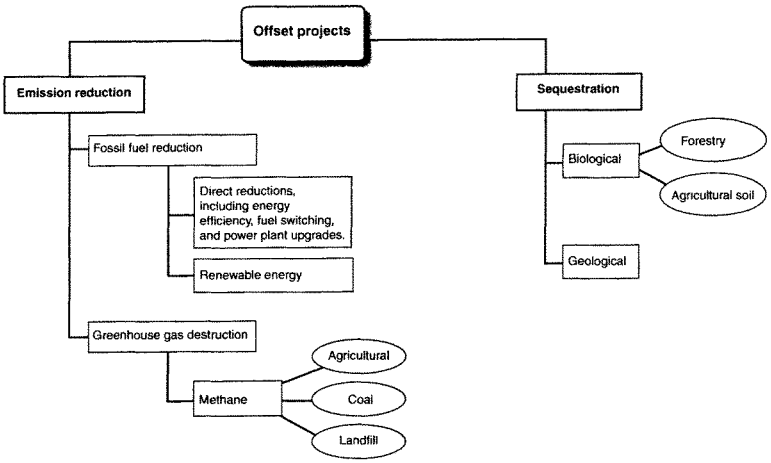
Ensuring the Credibility of Carbon Offsets Poses Challenges in the U.S. Voluntary Market

Our August 2008 report identified four primary challenges with the U.S. voluntary market.[2] First, the concept of a carbon offset is complicated because offsets can involve different activities, definitions, greenhouse gases, and timeframes for measurement. While most markets involve tangible goods or services, the carbon offset market involves a product that represents the absence of something—in this case, an offset equals the absence of one ton of carbon dioxide emissions or the equivalent quantity of another greenhouse gas.

Project developers produce offsets from a variety of activities such as sequestration in agricultural soil and forestry projects, and methane capture. Specifically, carbon offsets can result from three broad types of activities: (1) reductions of greenhouse gases, which may include activities such as the capture of methane from landfills or coalmines, (2) avoidance of greenhouse gases, which may include activities such as the development of renewable energy infrastructure, and (3) sequestration, which may involve storing carbon dioxide in geologic formations or planting trees that take carbon dioxide out of the atmosphere. See figure 1 for a diagram of common types of carbon offset projects.

[2]GAO, *Carbon Offsets: The U.S. Voluntary Market is Growing, but Quality Assurance Poses Challenges for Market Participants*, GAO-08-1048 (Washington, D.C.: Aug. 29, 2008).

Figure 1: Common Offset Project Types



Source: GAO based on Ricardo Bayon, Amanda Hawn, and Katherine Hamilton, *Voluntary Carbon Markets*, (Sterling, Virginia, Earthscan)

An additional complication is that the parties involved in generating, buying, and selling offsets may also use different definitions of a carbon offset. The term is often used generically to describe reductions or avoidances of emissions of any or all of the six primary greenhouse gases. Furthermore, these six gases vary in their potency or climate forcing effect, referred to as global warming potential. See table 1 for a description of U.S. greenhouse gas emissions and global warming potential. Scientists have developed a concept known as carbon equivalence that takes these variations into account and provides a way to describe emissions of different gases in comparable terms. For example, methane is roughly equivalent in global warming potential to about twenty one tons of carbon dioxide, the most common greenhouse gas.

Table 1: Shares and Global Warming Potentials of Greenhouse Gas Emissions from U.S. Sources, 2006

Greenhouse gas	Major sources	Percentage of total U.S. greenhouse gas emissions	Global warming potential
Carbon dioxide	Fossil fuel combustion, nonenergy use of fuels, and iron and steel production	85%	1
Methane	Landfills, natural gas and petroleum systems, agriculture, and coal mining	8	21
Nitrous oxide	Agricultural soil management, transportation, and manure management	5	310
Synthetic gases (HFCs, PFCs, and SF6)[a]	Substitution of ozone-depleting substances, electric power transmission and distribution, and aluminum production	2	140 to 23,900

Source: Environmental Protection Agency

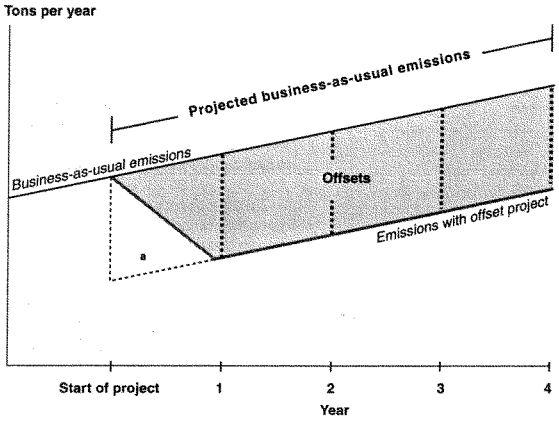
[a]HFCs (hydrofluorocarbons), PFCs (perfluorocarbons), SF6 (sulfur hexafluoride)

Finally, the timing of an offset's creation is complicated. In cases where offsets are sold before they are produced, the quantity of offsets generated from projects can be calculated using what is known as ex-ante (or future value) accounting. On the other hand, when offsets are sold after they are produced, the quantity of offsets can be calculated using ex-post accounting. Using future value accounting, consumers may purchase an offset today, but it may take several years before the offset is generated. Ensuring the credibility of offsets purchased before they are produced inherently involves a higher degree of uncertainty than purchasing an offset that has already been generated.

The second challenge is ensuring the credibility of offsets. Our prior work identified four general criteria for credible carbon offsets—they must be additional, quantifiable, real, and permanent. A carbon offset project is generally considered "additional" if it decreases emissions of greenhouse gases below the quantity that would have been emitted in a projected business-as-usual scenario. "Quantifiable" means the reductions can be measured, and "real" means the reductions can be verified. "Permanent" means the emissions reduced, avoided, or sequestered by a project will not be released into the atmosphere in the future.

Providing assurance that offsets are credible is inherently challenging because it involves measuring the reductions achieved through an offset project against a projected baseline of what would have occurred in its absence. For example, if a facility that emitted 200 tons of carbon dioxide per year implemented a project that reduced its emissions by 100 tons, it may have created 100 tons of offsets. See figure 2 for a hypothetical depiction of an offset project measured against a projected business-as-usual scenario.

Figure 2: Hypothetical Depiction of Offset Project Measured against Business-as-Usual Scenario



Source: GAO.

Our prior work found that additionality is fundamental to the credibility of offsets because only offsets that are additional to business-as-usual activities result in new environmental benefits. Several stakeholders we interviewed as part of our study said that there is no correct technique for determining additionality because it requires comparison of expected reductions against a projected business-as-usual emissions baseline. Determining additionality is inherently uncertain because, it may not be possible to know what would have happened in the future had the projects

not been undertaken. There are many ways to estimate whether projects are additional, and many stakeholders said that applying a single test is too simplistic because every project is different from others and operates under different circumstances.

There are many quality assurance mechanisms, commonly described collectively as "standards," for assuring the credibility of carbon offsets in the U.S. voluntary market, but few standards, if any, that cover the entire supply chain. The proliferation of standards has caused confusion in the market, and the existence of multiple quality assurance mechanisms with different requirements raises questions about the quality of offsets available on the voluntary market, according to many stakeholders. The lack of standardization in the U.S. market may also make it difficult for consumers to determine whether offsets are fully fungible—interchangeable and of comparable quality—a characteristic of an efficient commodity market. The term "carbon offset" implies a uniform commodity, but offsets may originate from a wide variety of project types based on different quantification and quality assurance mechanisms. Because offsets are not all the same, it may be difficult for consumers to understand what they purchase.

While the concept of carbon offsets rests on the notion that a ton of carbon reduced, avoided, or sequestered is the same regardless of the activity that generated the offset, some stakeholders believe that certain types of projects are more credible than others. Specifically, the stakeholders identified methane capture and fuel-switching projects as the most credible, and renewable energy certificates (REC) and agricultural and rangeland soil carbon sequestration as less credible.[3] The stakeholders' views on the credibility of different project types may stem from the fact that methane and fuel-switching projects are relatively simple to measure and verify, while other projects such as RECs, forestry, and agricultural and rangeland soil carbon projects face challenges related to additionality, measurement, and permanence. With respect to agricultural and rangeland sequestration and forestry, certain stakeholders said it is difficult to accurately measure emissions reductions from these types of projects. In addition, forestry offset projects may not be permanent because disturbances such as insect outbreaks and fire can return stored carbon to the atmosphere.

[3]Renewable energy certificates certify that a certain quantity of electricity has been generated from a qualifying type of renewable generation technology.

Third, there are economic and environmental tradeoffs associated with using offsets in a regulatory program to limit greenhouse gas emissions. In many cases, regulated entities may find it economically advantageous to buy offsets instead of reducing emissions themselves. The Environmental Protection Agency (EPA) has stated that the cost of compliance with mitigation policies under consideration by the Congress decreases substantially as the use of offsets increases. Specifically, EPA's analysis of the Climate Security Act of 2008 (S. 2191), introduced in the last Congress, reported that if the use of domestic and international offsets is unlimited, then compliance costs fall by an estimated 71 percent compared to the bill as written. Alternatively, the price increases by an estimated 93 percent compared to the bill as written if no offsets are allowed. Other studies show similar results. In general, the carbon price is lower in quantitative models of a U.S. compliance system when domestic and international offsets are widely available and their use is unrestricted. In the short term, lower prices make compliance with a policy to reduce emissions less expensive.

Multiple stakeholders we interviewed as part of our study said that including offsets in a compliance scheme could slow investment in certain emissions reduction technologies in regulated sectors and lessen the motivation of market participants to reduce their own emissions. According to some stakeholders, if more cost-effective offsets are available as compliance tools, regulated sources may delay making investments to reduce emissions internally, an outcome that could ultimately slow the development of, and transition to, a less carbon-intensive economy.

Fourth, allowing the use of offsets could compromise the environmental certainty of a regulatory program to limit emissions of greenhouse gases if the offsets do not meet requirements that underpin their integrity. If a significant number of nonadditional offsets enter the market, emissions may rise beyond levels intended by the scheme, according to some stakeholders. Nonadditional offsets could thus increase uncertainty about achieving emissions reduction goals. This concern underscores the importance of using quality assurance mechanisms to ensure the credibility of any offsets allowed into a compliance scheme. Using offsets in a compliance scheme could also increase administrative costs because of increased government oversight of quality assurance mechanisms used to ensure the credibility of offsets.

Concerns associated with using offsets for compliance in a regulatory system to limit emissions could be minimized by restricting the use of

offsets or including policy options for enhancing oversight of the market such as applying discounts or imposing insurance requirements on offsets with greater uncertainty or potential for failure. Certain stakeholders suggested imposing limits on the use of offsets in a compliance scheme to address some of these challenges, but stakeholders held different opinions about the potential effectiveness of this approach. Some said it may be necessary to place restrictions on the use of offsets in order to achieve internal emissions reductions from regulated sources. If all the effort to reduce emissions is in the form of offsets, then the compliance system may not provide the price signals necessary for long-term investment in technology at domestic industrial facilities and power plants, according to multiple stakeholders. They said that domestic abatement is central to achieving the long-term goal of any emissions reduction system. However, other stakeholders said that incorporating offsets into a compliance scheme will enable greater overall climate benefits to be achieved at a lower cost, as long as offsets are additional and are not double-counted.

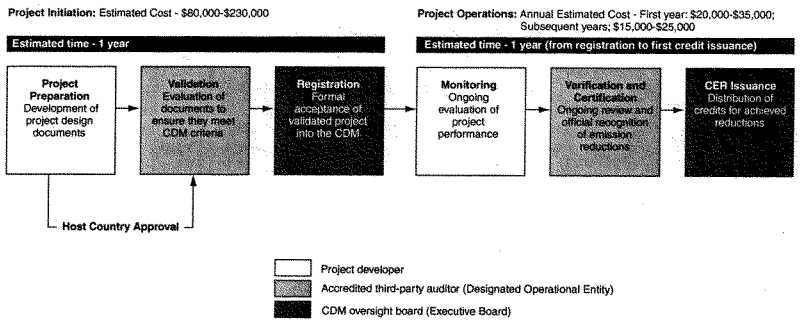
The CDM's Environmental and Economic Effects Provide Important Lessons About the Role of Carbon Offsets in Mandatory Programs to Limit Emissions

Our November 2008 report discussed the environmental and economic effects of the CDM and identified lessons learned about the role of carbon offsets in mandatory programs to limit emissions.[4] First, with respect to environmental effects, the overall effect of the CDM on international emissions is uncertain, largely because it is nearly impossible to determine the level of emissions that would have occurred in the absence of each offset project. The CDM imposes a rigorous set of review requirements for applicants to complete before obtaining project credits, known as Certified Emissions Reductions (CERs), which can be sold or used for compliance with targets under the Kyoto Protocol. Applicants must demonstrate, among other things, that the project would not have occurred without the CDM and to obtain approval of the Executive Board,

[4]See GAO, *International Climate Change Programs: Lessons Learned from the European Union's Emissions Trading Scheme and the Kyoto Protocol's Clean Development Mechanism*, GAO-09-151 (Washington, D.C.: Nov. 18, 2008).

a regulatory body established by the Kyoto Protocol.[5] See figure 3 for the resources and time associated with each step in the review process.

Figure 3: CDM Project Cycle



Source: GAO analysis of UNFCCC documents and UNDP data.

This resource- and time-intensive process, however, has involved challenges. While the CDM project review process may provide greater assurance of credible projects, available evidence suggests that some credits have been issued for emission reduction projects that were not additional. Because additionality is based on projections of what would have occurred in the absence of the CDM, which are necessarily hypothetical, it is impossible to know with certainty whether any given project is additional. Researchers have reported that some portion of projects registered under the CDM have not been additional, and although

[5]Applicants seeking CDM credits must demonstrate the proposed projects are additional—i.e., that the project would not have occurred without the CDM due to technological, economic, or other barriers. As part of this demonstration, applicants estimate the reductions achieved by the project using a projected business-as-usual baseline. An external party must validate documentation and verify emission reductions. In addition to Executive Board approval, projects must undergo review by national officials of the country where the project occurs before credits are issued. Once approved, emissions from each project are monitored periodically in accordance with procedures outlined in the initial project proposal. Credits are issued only for emission reductions that have been verified by a separate, independent auditing firm.

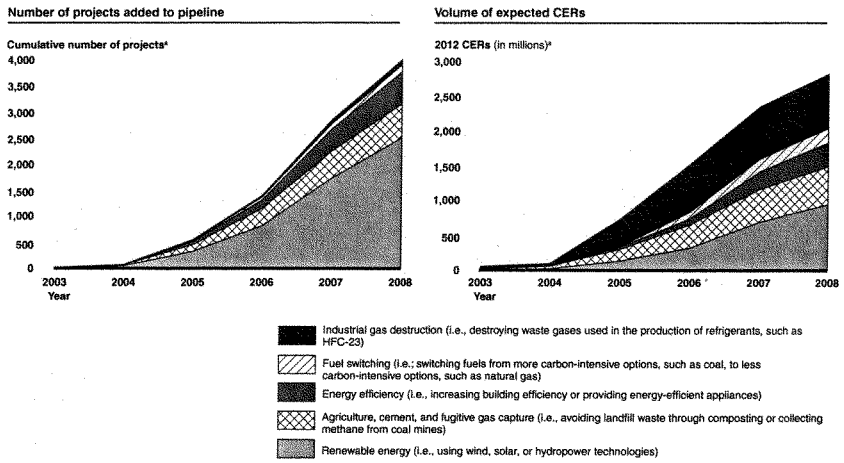
there is little empirical evidence to support a precise figure, some studies have concluded that a substantial number of nonadditional projects have received credits.[6]

Second, with respect to economic effects, specifically opportunities for cost-effective reductions, available information and experts indicate that the CDM has enabled industrialized countries to make progress toward achieving their emissions targets at less cost and has involved developing countries in these efforts. For example, facilities covered under the European Union's Emissions Trading Scheme (ETS) may invest in CERs as a lower-cost alternative to reducing emissions on-site or purchasing allowances under the ETS.[7] Further, the availability of CERs may produce lower allowance prices than would be observed under a no-offset scenario. As a result, the CDM can potentially reduce firms' compliance costs regardless of whether these firms choose to purchase CERs. See figure 4 for information about the number and types of offset projects in CDM pipeline. The first chart in figure 4 shows the most common types of projects and their growth over time while the second chart shows the volume of credits expected to be produced through 2012.

[6]See, for example, Schneider, Lambert, *Is the CDM fulfilling it environmental and sustainable development objectives? An evaluation of the CDM and options for improvement* (Berlin, Germany, 2007).

[7]Covered entities in the ETS need to hold allowances for their emissions, and each allowance entitles them to emit a specific amount of carbon dioxide. Under the ETS, covered entities have been able to use certain CDM credits in addition to ETS allowances to cover their emissions.

Figure 4: CDM Pipeline



Source: GAO analysis of UNEP Risoe Center data (2008).

The demand for CERs has also provided developing countries that do not have emissions targets under the Kyoto Protocol with an economic incentive to pursue emission reduction activities. However, while CDM projects have been established in over 70 developing countries, most benefits have thus far accrued to fast-growing nations such as China and India. In fact, these two countries host over half of all registered projects. Conversely, countries in Africa and the Middle East have seen little CDM-related investment.

We also reported that investors in the CDM market face higher risks, depending on, for example, whether the rights to the CDM credits are

purchased prior to actual issuance of the credits.[8] Because the credits in this case are not issued until the project is completed and emissions are verified, there is some risk that the project will not produce the expected number of credits. For example, the CDM's Executive Board may delay or reject a project and even approved projects might not be built on schedule or within budget. Further, the amount of actual reductions may differ from what was planned—for example, wind energy projects may generate more or less electricity depending on weather conditions. One study shows that projects reaching the registration phase tended to yield only about 76 percent of their forecasted CDM credits.

Our review of the CDM experience, in particular using offsets in a compliance program, revealed that reducing compliance costs while maintaining overall environmental integrity can prove difficult. Using available information, stakeholder interviews, and our experts' responses to a questionnaire, we identified three key lessons learned about the use of offsets in programs to limit emissions.

First, the use of offsets can compromise the integrity of programs designed to reduce greenhouse gas emissions. In theory, if all offsets were real and additional, their use in a mandatory program to limit emissions shifts the location of the emission reductions and would not negatively affect the scheme's integrity. However, as many experts mentioned, it is nearly impossible to demonstrate project additionality with certainty. Because the CDM is primarily used by countries to comply with the Kyoto Protocol's binding targets and the ETS emissions caps, credits that do not represent real and additional emission reductions do not represent progress toward these targets or caps. If a significant number of nonadditional credits are allowed into the program, for instance, these credits may allow covered entities to increase their emissions without a corresponding reduction in a developing country. This can cause emissions levels to rise above the targets set by the program, introducing uncertainty as to the actual level of reductions, if any, achieved by the program. As a result, this use of nonadditional offsets negates one of the advantages—greater certainty about the level of emissions—of a cap-and-trade program compared to other market-based programs.

[8]Known as "primary CERs," these credits involve a higher level of uncertainty because most purchases involve forward contracts—the buyer purchases the rights to future credits instead of the credits themselves. See GAO-09-151 for more detailed discussion.

Some research has advocated limiting the use of offsets in compliance schemes as a way to reduce the environmental risk of nonadditional projects; however, our research shows that even restricted offset use can have broad environmental implications. In particular, the experience of the European Union's ETS illustrates the importance of considering offset limits in the context of a country's overall reduction effort, in addition to its overall emissions target. As noted previously, limiting offsets based on the overall emissions cap—for example, allowing countries to meet 12 percent of their emissions cap with offsets—may mean in practice that most or all reductions occur outside of that country's borders. If most reductions occur elsewhere, there may be little incentive for entities under the compliance program to make infrastructure changes or other technological investments. Furthermore, the negative environmental effects of nonadditional offsets increase as the number of imported credits rises. On the other hand, stringent limits can ensure that a certain portion of abatement activity occurs at home and help secure a carbon price that is high enough to spur investment in low-carbon technologies; limits also can lessen the impact of nonadditional credits. If limits are imposed, therefore, it is important that such limits are sufficiently stringent and are based on actual expected emission reductions, not the overall emissions cap.

Second, carbon offset programs involve important tradeoffs and the use of such programs may be, at best, a temporary solution to addressing climate change. While the CDM may encourage developing countries to participate in emission reduction activities, it also may increase their reliance on external funding for such activities. According to several experts, the CDM effectively deters efforts that fall outside the scope of creditable activities. Moreover, as many of our experts pointed out, the concept of additionality presents a difficult regulatory problem. Rigorous project reviews may help ensure some degree of credit quality, but also can increase the overall cost of the program. Overall, many experts suggested that the CDM has not yet achieved an effective balance of these priorities.

There is general consensus among climate change experts that both industrialized and developing countries must be engaged in emission reduction efforts to meet international emission reduction goals. In light of these circumstances, several experts we consulted noted that international offset programs such as the CDM can help to engage developing nations and encourage emission reductions in areas that may not otherwise have incentives to do so. Several experts also said that the CDM helps stimulate interest in international climate change dialogue and may help facilitate progress toward future emission reduction commitments.

Given these tradeoffs, some observers have said the best approach may be to gradually incorporate developing nations under a global emission reduction plan or move toward full-fledged, worldwide emission trading. However, political and institutional capacity may make worldwide emission trading an unlikely possibility. As a result, the CDM may be best used as a transition tool to help developing nations move toward a more comprehensive climate change strategy.

Third, the CDM's approval process may not be a cost-effective model for achieving emission reductions. Most experts expressed dissatisfaction with this approach, which requires individual review and additionality assessments for each project. Observers also have described the project-by-project approach as inefficient, noting that the long, uncertain process can create risks and costs for investors. Host country stakeholders we spoke with generally agreed with this assessment, saying that the process was bureaucratic and overly burdensome. Indeed, the length and administrative complexity of the process, as well as the shortage of available emission verifiers, has resulted in bottlenecks and delays as the CDM's administrative structure has struggled to keep up with the number of projects. Moreover, the transaction costs and investment risks associated with CDM projects can reduce their effectiveness as a cost-containment mechanism when linked to compliance schemes. While the CDM's intensive review process may help ensure some degree of environmental integrity, it also can limit the number of potential projects in the system. For example, the cost to initiate a CDM project and usher it through the approval process may be too high for certain projects, rendering them unviable.

The CDM's oversight board has taken a number of actions to help improve the process over time, but many experts said that the program does not yet provide a sufficient level of quality assurance. Also, it is unlikely under the current approach that the CDM will achieve large-scale reductions or significantly impact global emissions in the future. The scale of the CDM is limited not only by the extensive set of requirements; it also is constrained by the fundamental time and resource limitations of the 10-member Executive Board and its subsidiary panels, and the shortage of accredited auditing firms to validate projects and verify emissions. Even assuming all projects are real and additional, it is likely that reductions from these projects will only represent about 2 percent to 3 percent of annual energy-related carbon dioxide emissions in China and India, and less than 1

percent in Africa.[9] Finally, the design features of an offset program such as the CDM can be fine-tuned to help maximize their effectiveness, but the underlying challenges of determining additionality, for example, may not be eliminated completely.

While some of the experts who participated on our panel said that offset programs on their own are unlikely to be sufficient to help curb developing country emissions, others stated that reforming or supplementing the CDM could make a broader impact worldwide. Experts provided a number of potential improvements to the CDM, many of which would represent fundamental changes to the current mechanism's structure and procedures. For example, moving toward a sectoral approach under the CDM would involve crediting emission reductions in relation to baselines set for different economic sectors, such as a benchmark based on the best available technology for the industry, rather than making a project-specific determination of additionality. A sectoral approach would eliminate the need for project-specific determination of additionality, because credits are awarded based on performance in relation to a predetermined baseline. However, this approach requires reliable historic emissions data to set baselines and the technical capacity to monitor emissions, requirements which may prove problematic for some developing countries.

In addition, a few experts recommended discounting CDM credits. For example, with a discount rate of 30 percent, a project that is expected to reduce carbon dioxide by 100 metric tons would only receive 70 credits. While discounting may not help screen out nonadditional projects, it can help mitigate the environmental consequences of nonadditional credits. Our November 2008 report discusses these and other alternatives to the CDM in greater detail.[10]

[9]Analysis uses country-specific emissions data from IEA, Key World Energy Statistics (2008) as well as data on expected CERs from the UNEP Risoe CDM/JI Pipeline Analysis and Database, Oct. 1, 2008. IEA data for each region are based on 2006 indicators and include emissions from fuel combustion only.

[10]See GAO-09-151.

GAO's Reviews of Carbon Offset Markets Have Identified Matters for Congressional Consideration in Developing Climate Change Legislation

Our reports on two different markets for carbon offsets—the U.S. voluntary market and the CDM under the Kyoto protocol—have identified matters for the Congress to consider as it deliberates legislation to limit greenhouse gas emissions. While carbon offsets have the potential to lower compliance costs for entities that could be affected by regulatory limits on emissions, their use for compliance in a mandatory emissions reduction scheme could undermine the program's integrity if the offsets lack credibility.

Our report on the voluntary market for offsets in the United States highlights the complexity and challenges with a largely unregulated market that lacks transparency and provides market participants with limited information on the credibility of offsets. Alternatively, our work on CDM identifies challenges with using carbon offsets in a mandatory emissions reduction program despite the use of rigorous quality assurance procedures. The experience with both markets demonstrates the importance of ensuring the credibility of offsets, but this remains a challenge for both markets because of the inherent uncertainty associated with estimating emissions reductions relative to projected business-as-usual baselines. Using offsets in a mandatory emissions reduction program would involve fundamental trade-offs between offset credibility and compliance costs.

As we have reported, to the extent that the Congress chooses to develop a program that limits greenhouse gas emissions while allowing the use of carbon offsets for compliance, it may wish to establish (1) clear rules about the types of offset projects that regulated entities can use for compliance, as well as standardized quality assurance mechanisms for these allowable project types; (2) procedures to account and compensate for the inherent uncertainty associated with offset projects, such as discounting or overall limits on the use of offsets for compliance; (3) a standardized registry for tracking the creation and ownership of offsets; and (4) procedures for amending the offset rules, quality assurance mechanisms, and registry, as necessary, based on experience and the availability of new information over time.

In addition, our report on international carbon offset programs generated matters for consideration that may prove useful if the Congress looks to the CDM as a model for an offset program. Specifically, Congress may wish to consider that (1) the existing program may not be the most direct or cost-effective means of achieving reductions in emissions, (2) the use of carbon offsets in a cap-and-trade system can undermine the system's integrity, given that it is not possible to ensure that every credit represents

a real, measurable, and long-term reduction in emissions; and (3) while proposed reforms may significantly improve the CDM's effectiveness, carbon offsets involve fundamental tradeoffs and may not be a reliable long-term approach to climate change mitigation.

Contact and Staff Acknowledgments

Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this statement. For further information about this testimony, please contact John Stephenson, Director, Natural Resources and Environment at (202) 512-3941 or stephensonj@gao.gov. Key contributors to this statement were Michael Hix (Assistant Director), Kate Cardamone, Janice Ceperich, Jessica Lemke, Alison O'Neill, and Joe Thompson. Cindy Gilbert, Anne Johnson, Richard P. Johnson, Ardith A. Spence, and Lisa Vojta also made important contributions.

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Mr. MARKEY. Our next witness is Gary Gero. He is the president of the Climate Action Reserve. His organization is a recognized leader in the development of offset protocols and standards, and he is an expert in this field.

So we welcome you, sir. Whenever you are ready, please begin.

STATEMENT OF GARY GERO

Mr. GERO. Thank you. And good morning, Chairman Markey, honorable members of the committee. I thank you for the opportunity to be here today, and I thank you for your attention to this important topic.

My name is Gary Gero. I am the president of the California Climate Action Registry, a 501(c)(3) nonprofit organization. The California Registry was created in 2001 by the State of California to provide regulatory quality greenhouse gas accounting standards and public registration of greenhouse gas emissions data. We were established specifically for the purpose of recognizing and encouraging early voluntary actions to address the serious threat of climate change. We are today a fully independent, national environmental nonprofit organization that is guided by a board of directors comprised of leaders from government, business and the environmental community.

Since our beginning we have developed and become widely recognized for our expertise in rigorous and accurate greenhouse gas accounting. More recently we have applied this expertise to create and operate a greenhouse gas emission reduction credit or offsets registry. This offsets registry is known as the Climate Action Reserve, and to date more than 40 emission-reduction projects from 18 U.S. States have been submitted to it. Additionally, the States of California and Pennsylvania have formally recognized our standards for quantifying early voluntary actions.

The Climate Action Reserve provides several tests to ensure the environmental integrity of the offsets that we register. First, we develop and implement standardized, performance-based protocols to quantify a project's greenhouse gas emission reductions. These protocols are the accounting standards that we use to ensure that the emission reductions are real. And that they are accurate. Included in these are methods for demonstrating that a project would not have happened anyway; that is, that the project is surplus or additional. Our protocols also specify mechanisms for ensuring the permanence of sequestration offsets.

Second, we actively manage an independent third-party verification program to ensure that our standards are being met. As you well know, strong rules are meaningless without strong enforcement. As part of this we work with the American National Standards Institute to train, accredit and assiduously oversee verifiers.

Third, we will oversee a robust offset registration, serialization and tracking system to ensure ownership and prevent double counting. Indeed. We create a unique serial number for every ton of emission reduction so that ownership can be clearly established. These are elements of our program's contractual standards which are necessary to ensure that the offsets are enforceable.

So I have described what we do, but let me take a second to say what we do not do, because I think that, too, can inform good program design.

To avoid real or even perceived conflicts of interest, we do not fund or otherwise develop emission-reduction projects, nor do we serve as an exchange for offset credits or otherwise engage in financial transactions concerning such credits. Further, we are not an advocacy organization. As an environmental nonprofit organization, our public benefit mission is to ensure that when an emission reduction is reported, there is certainty that is has truly resulted in a benefit to the environment.

Let me briefly describe the four guiding principles that are the core to our efforts and that are vital to ensuring the integrity of any offsets program. The first, clearly, is accuracy, which is to ensure that measurement estimation techniques and emission factors reflect best-available science.

The second is conservativeness. Despite best efforts, or sometimes for reasons of practicality, there are times when there is some uncertainty with regard to the quantification of emission reductions. In such cases, the guiding principle that we rely on is conservativeness so that emission reductions are not overestimated.

The third is transparency. Transparency ensures that outside observers have unhindered access to all aspects of our work so that they may gauge for themselves its accuracy and its credibility.

And, finally, practicality. Notwithstanding our other guiding principles, the Reserve recognizes that, for a program to function effectively, it must not simply be an academic exercise. Instead, it must incorporate a commonsense approach and be practical. It is important that any offsets program only be as complex as is necessary to retain its rigor and its credibility, but no more so.

So let me conclude with this. I believe that the experience of the Climate Action Reserve has clearly demonstrated that it is possible to design and implement an effective, credible, and practical offsets program.

I thank you for the opportunity to be here today, and I am happy to answer any questions you may have.

[The prepared statement of Mr. Gero follows:]

TESTIMONY OF GARY GERO, PRESIDENT OF THE CALIFORNIA CLIMATE ACTION REGISTRY

BEFORE THE HOUSE ENERGY AND COMMERCE COMMITTEE SUBCOMMITTEE ON ENERGY AND ENVIRONMENT UNITED STATES HOUSE OF REPRESENTATIVES

MAKING OFFSETS WORK: ENSURING THE ENVIRONMENTAL INTEGRITY OF GREENHOUSE GAS EMISSION REDUCTIONS IN A FUNCTIONING OFFSETS PROGRAM

MARCH 5, 2009

Executive Summary

The California Climate Action Registry has applied its recognized expertise in rigorous and accurate greenhouse gas (GHG) accounting to the quantification of GHG emission reductions through its national Climate Action Reserve™ ("Reserve") program. The Reserve develops and implements standardized, performance-based project protocols, actively manages an independent, third-party verification program, and oversees a robust registration, serialization, and tracking system to ensure ownership and prevent double counting of emission reductions. The Reserve provides stringent criteria and sound mechanisms to ensure that GHG emission reduction projects meet the key tests of being real, permanent, additional, verifiable, and enforceable, and its activities are guided by the key principles of accuracy, conservativeness, transparency, and practicality. As a result of the credibility of its efforts, the states of California and Pennsylvania have recognized the Reserve for the purposes of quantifying early voluntary actions within those states, and several environmental organizations have expressed their support for the Reserve's activities. The Climate Action Reserve provides real-world experience that demonstrates how a regulatory quality GHG emission offsets program can be designed and implemented.

The California Climate Action Registry

The California Climate Action Registry (CCAR) is an independent 501(c)(3) nonprofit organization headquartered in Los Angeles, California that is dedicated to addressing the serious challenge of climate change through the accurate quantification and public reporting of GHG emission inventories and emission reduction projects, and by promoting activities to reduce such emissions. Originally created by state legislation in California in 2001[1] to focus on creating standards for the calculation of baseline emission inventories, CCAR is a widely recognized expert in the development and implementation of GHG quantification standards and protocols.

Over the past two years, CCAR has applied this expertise across the United States to ensure the environmental integrity of GHG emission offsets through its Climate Action Reserve program. It has done this by working with a broad range of stakeholder interests to set strong and credible standards for quantifying emission reductions, creating a strong program to accredit and oversee verifiers, and establishing a public registry to serialize, track, and retire emission reductions. The Climate Action Reserve's emission reduction credits are known as Climate Reserve Tonnes™ (CRTs or "carrots") and are widely regarded as among the highest quality in the voluntary carbon market today. Each CRT represents one metric ton of CO_2-equivalent (CO_2-e) emission reductions or removals from the atmosphere. To avoid the potential for conflicts of interest, CCAR does not fund or otherwise develop emission reduction projects, nor does it serve as an exchange for offset credits or otherwise engage in financial transactions concerning such credits.

In recognition of the credibility of its efforts, the State of California Air Resources Board has adopted five of the Reserve's protocols for the quantification of early voluntary actions under AB32[2] and the State of Pennsylvania has stated that it will recognize early voluntary actions taken pursuant to the Reserve's protocols[3]. Further, in keeping with its goal of engaging all stakeholders, the Board of Directors of the California Climate Action Registry is comprised of representatives from government agencies, businesses, and environmental organizations.

Role of Offsets in Cap and Trade Programs

The California Climate Action Registry is not an advocacy organization and, as such, does not take policy positions. Nevertheless, CCAR recognizes that offsets have a role in both the voluntary and regulatory arenas and believes that to the extent that offsets are part of such systems, the associated emission reductions must be credible. CCAR also recognizes that the fundamental role of offsets is to provide economic efficiency and cost containment within regulatory cap and trade programs by obtaining emission reductions at a lower cost than would be possible within the capped system. Offsets can also serve to obtain emission reductions in sectors not well suited to regulation or capped, promote the use of new technologies, and provide co-benefits not related to the reduction of GHG emissions. Finally, offsets can serve as a means of allowing entities that are covered under a cap sufficient time to plan and implement onsite emission reductions.

Today, the only operating cap and trade program in the U.S. is the Regional Greenhouse Gas Initiative (RGGI) that covers electric utility emissions in the Northeast U.S.[4] Additionally, the framework details for broader California and Western Climate Initiative[5] (WCI) programs have been released and are under consideration, and the initial framework for the Midwestern Greenhouse Gas Reduction Accord (MGGA) has been announced. In each of these instances, a standardized, performance-based approach to crediting offset reductions is being implemented or recommended.

In line with this approach, both RGGI and the WCI have developed a list of priority offset project types for inclusion in their programs. Project types identified by both programs include afforestation; methane capture and destruction from livestock operations; and methane capture and destruction from landfills. RGGI has also developed protocols for projects that reduce the leakage of SF_6 from electric utility applications and for projects that improve end-use thermal

energy efficiency. The WCI has identified other kinds of forestry and sequestration projects as a priority, along with wastewater management projects.

The Climate Action Reserve has developed and implemented performance-based protocols for most of these sectors and is actively assessing the others. To date, the Reserve has adopted performance-based protocols for reforestation, conservation-based forest management, avoided forest conversion, urban forestry, and methane capture and combustion for livestock operations and for landfills.

Ensuring Environmental Integrity – Setting Standards

An offset represents the reduction, removal, or avoidance of GHG emissions from a specific project that is used to compensate for GHG emissions occurring elsewhere.[6] Because offsets represent something that does not exist (the reduction or removal of emissions from the atmosphere), they are intangible. Therefore, to ensure their integrity it is necessary to determine their ability to meet a set of prescribed criteria which have been largely defined in the field as follows[7]:

Real – Quantified GHG reductions must represent actual emission reductions that have occurred (not merely be projected to occur) and not be the artifacts of incomplete or inaccurate accounting.

Permanent – GHG reductions (or removals, in the case of sequestration) should be permanently removed from the atmosphere, and/or be backed by replacement mechanisms if they are re-emitted to the atmosphere (i.e., are "reversed").

Surplus – GHG reductions should be the result of a response to the existence of a market for such reductions; that is, they should not be reductions that would have happened anyway (i.e., they are "additional").

Verifiable – GHG reductions should result from projects that can be accurately monitored and verified.

Enforceable – GHG reductions should be supported by legal instruments that define their creation, provide for transparency, and ensure exclusive ownership.

The key challenge to ensuring the integrity of GHG offsets is to establish and administer tests to determine the ability of an emissions reduction project to satisfy the above criteria. Such tests, or standards, can be distinguished into three categories as follows[8]:

Accounting Standards – These are standards related to the actual quantification of GHG reductions. Accounting standards specify methods for defining quantification boundaries, estimating baseline emissions, and correcting for unintended changes in emissions (i.e., "leakage"). Accounting standards also encompass methods for demonstrating that a project would not have happened anyway (i.e., "additionality"). Finally, they may specify methods for treating non-permanent GHG removals on equal footing with permanent GHG reductions.

Accounting standards are a first-order requirement for ensuring that "a ton is a ton" and ensure that offsets are ***real, surplus, and permanent.*** Prescriptive requirements for these are incorporated into the Project Reporting Protocols adopted by the Climate Action Reserve for each project type.

Procedural and Technical Standards – These are standards related to the validation, monitoring, and verification of offset projects, as well as the certification and crediting of GHG reductions. Procedural and technical standards ensure that offsets are ***verifiable***. Prescriptive requirements for these are incorporated into the Reserve's Project Verification Protocols that serve as accompanying documents for each Project Reporting Protocol, and are also described in the Climate Action Reserve Program Manual[9].

Contractual Standards – These are standards for the establishment and transfer of property rights related to GHG reductions, and for information disclosure, and can include terms for compensation where GHG removals are reversed. Contractual standards are necessary to avoid double-issuance and double-counting of GHG reductions, and ensure that offsets are ***enforceable***. The Climate Action Reserve incorporates such contractual standards into its project protocols, as well as in its Program Manual, Terms of Use, and Operating Procedures[10]. It also creates a unique serial number for every ton of emission reductions, or CRT, so that ownership can be clearly established and reductions cannot be double counted or sold.

Guiding Principles for the Climate Action Reserve

The Climate Action Reserve provides each of the accounting, technical, and contractual standards described above to ensure that its program is comprehensive. In administering these key elements, we are guided by several key principles. Indeed, since our inception in 2001, CCAR has developed and implemented its programs with the recognition that the emission inventory and emission reductions data that it registers must meet rigorous regulatory-grade standards to ensure that such data are recognized by the State of California. This goal has been met with the adoption of the California Global Warming Solutions Act that specifically requires the Air Resources Board to incorporate the standards and protocols adopted by CCAR into the state's regulatory program "to the maximum extent feasible."[11] Therefore, in crafting its quantification, verification, and reporting protocols, several key principles have consistently guided its decision making. These are as follows:

Accuracy – Ensuring that baseline conditions and emission reductions are accurately estimated and quantified is at the core of providing credible GHG offsets. The Climate Action Reserve strives for a high degree of accuracy in the measurements, calculations, and estimates of project activities to reduce uncertainty as much as is practical. This accuracy is achieved by considering a variety of factors, including setting appropriate accounting boundaries to ensure all relevant sources (and sinks) of emissions are included, relying on best available science for quantifying or modeling emissions, and prescribing the use of high-quality monitoring equipment.

Conservativeness – Despite best efforts, or for reasons of practicality, there are instances in which there is a degree of uncertainty with regard to the quantification of emission reductions. In such cases, the guiding principle for the Reserve is to rely on conservativeness to ensure that

the GHG emission reductions are not overestimated. By avoiding overestimation, the Reserve ensures that offset credits ("Climate Reserve Tonnes or CRTs") are only issued for real reductions.

Transparency – A hallmark of the work of CCAR has been and continues to be the open and transparent manner in which it conducts all of its activities to ensure that outside observers can themselves gauge the accuracy and credibility of our efforts. This principle guides the development and implementation of our protocols and associated processes, and continues through project verification and registration. From the unique serial number assigned to every ton of emission reductions, or CRT, any member of the public can trace the project documents, verification reports, underlying protocols, and protocol source documents that led to the registration of that emission reduction.

Practicality – Notwithstanding our other guiding principles, the Reserve recognizes that for a program to function, it must not simply be an academic exercise, but must instead incorporate real common-sense and practicality. Therefore, where further increasing accuracy, reducing uncertainty, or enhancing transparency is not practical or necessary to ensure a high degree of program credibility and rigor, it is not automatically pursued. Similarly, we seek to prevent or remove potential programmatic barriers to the implementation of emission reduction projects when doing so can be achieved without compromising program credibility.

How the Climate Action Reserve Addresses Key Accounting Criteria

Additionality

The concept of a project being "additional," that is that it would not have occurred otherwise except for the incentive provided by the existence of a GHG offset credit market, is central to ensuring the credibility of an offsets program, though it is fraught with potential complexities and challenges. CCAR began writing its first project protocol in 2004 and, in so doing, directly faced this challenge by evaluating the range of potential approaches. Two distinct approaches were available for consideration: namely, the project-specific assessments conducted under the Clean Development Mechanism (CDM)[12] program enabled by the Kyoto Protocol and a broader, standardized, performance-based approach to whole project categories that has been promoted by the U.S. Environmental Protection Agency, most recently under its Climate Leaders program[13].

In evaluating these approaches, CCAR recognized that project-specific assessments had the potential to introduce a high degree of subjectivity into determining the eligibility and quantification of each project, as well as create uncertainty for investors and a significant administrative burden. In particular, the CDM program relies in part on project-specific financial additionality tests that are meant to determine whether it is the value of offset credits that makes a project financially viable. Doing so requires an evaluation of the financial circumstances of the project proponent, their cost of funds (including opportunity costs), their internal rate of return, and other non-environmental considerations which vary from project to project and which are potentially malleable.

As an alternative to this approach, the concept of a performance-based standard was developed in which an assessment of a category of projects is conducted to determine what degree of

emission reduction performance can be reasonably assumed to be additional. Such performance-based standards may specify an emissions rate or a particular technology that serves as a threshold for eligibility and that on its own is indicative of better than "business as usual" circumstances. In this way, the performance standard uses proxy tests for determining additionality, rather than project-specific financial and other assessments. The performance-based approach results in clear and consistent rules, thereby significantly reducing subjectivity in determining project additionality and eligibility.

Baseline Determination
Once a project is determined to be eligible and additional, it is necessary to make a determination about the baseline from which the project reductions will be quantified. To do this, the Reserve also prescribes a standardized approach rather than a project-specific analysis. Similar to the performance-based approach to additionality, the evaluation of baseline conditions is conducted on a project-type basis using standardized assumptions and emission factors to calculate a default baseline.

This standardized approach differs from project-specific assessments, which attempt to demonstrate for each individual project what would have occurred in the absence of that project. The standardized approach considers the sector as a whole and makes a determination as to what are future "business as usual" circumstances. In setting such baselines, the Reserve recognizes the inherent uncertainty of predicting a future "business as usual" counterfactual scenario, and so fully applies the guiding principle of conservativeness here to ensure projects are not over credited.

Standardized approaches reduce uncertainty about how many emission reductions to expect, and increase transparency for both project developers and outside observers. Furthermore, by incorporating some project-specific information and data, it is possible to increase accuracy without sacrificing the certainty and objectivity of the performance-based approach. In practice, the Reserve has employed performance-based approaches that do, in fact, consider some project-specific variables, but only to the extent that doing so sufficiently increases accuracy without introducing ambiguity or undue administrative complexity. Indeed, as a nonprofit organization, it is important that the program we administer in this regard only be as complex as is necessary to retain rigor and credibility, but no more so.

Permanence
To be effective in offsetting the actual emissions of greenhouse gases into the atmosphere, a GHG emission reduction (or removal in the case of a sequestration activity) must permanently remain out of the atmosphere, otherwise the benefit to the atmosphere and the environment is lost. In general, this is not a concern for direct emission reduction activities like methane destruction, since once destroyed the process is irreversible.

Sequestration activities, however, are the removal of carbon dioxide from the atmosphere and fixing the carbon through a biological process, such as in the generation of tree fiber. While sequestration processes are well understood and the associated carbon storage can be quantified with certainty, these processes have the potential to be reversed, such as when a tree is lost to fire or disease. In such cases, the stored carbon in the tree is returned to the atmosphere and its offset

value is nullified. Recognizing this potential does not preclude sequestration activities from participating in an offsets program if adequate mechanisms are instituted to guarantee or insure the permanence of the removal.

Currently, forest-based offset credits in the Climate Action Reserve are guaranteed through the imposition of replacement requirements between the private owner and purchaser of such offsets. However, we re-formed a workgroup to update our Forest Project Protocols in November 2007 to address this and other issues on a system-wide basis. As a result of this effort, the next iteration of our forest protocols (which are scheduled for adoption in May 2009) will include the creation of a three-stop process to guarantee the permanence of these offset credits.

The first step in this process is the imposition of an annual reporting requirement that will ensure that any reversals that do occur are quickly identified and managed. Second, project proponents will be required to enter into an enforceable recorded agreement with the Reserve that will obligate them and any subsequent landowners to compensate the Reserve for any intentional reversals (such as from harvesting or land conversion) that occur. Finally and most significantly, we will create an insurance pool from which unintentional reversals (such as those due to fire, disease, pests, or storm damage) will be automatically compensated from within our Reserve program. To populate the insurance pool, the Reserve will require that a risk assessment for the potential of reversals be conducted and that projects contribute credits to the pool based on their levels of risk. Functioning very much as like traditional insurance, the Reserve will administer the pool and use it to compensate for any reversals that occur and will itself be re-insured to ensure overall system integrity.

Leakage
Accounting for "leakage" is important for accurately estimating net emission reductions and ensuring that credited reductions are real. Leakage is the idea that the reduction of emissions from a project activity may result in an increase in emissions elsewhere (thus the emission reductions are "leaked" back into the atmosphere). A prime example of this concept is in the area of forestry where the reduction in harvesting of a forest project does not diminish the overall demand for wood products and to meet that demand another forest owner increases his or her harvest rates to meet that demand. The Reserve accounts for the potential for leakage to occur in all of its protocols by conducting a leakage assessment and, where such potential exists, requiring that the quantification of emission reductions or removals reflect and account for this potential.

Transparency in the Climate Action Reserve

Perhaps the most integral element of ensuring the credibility of any program is to make sure that its standards, processes, and operations are as open and transparent as possible to allow the public to assess for themselves its integrity. The CCAR has deeply and fundamentally incorporated transparency into every element of the Climate Action Reserve program, starting with how protocols are developed through how projects are verified and registered, and how CRTs are issued, tracked, and retired within the system.

The Reserve's protocol development process is based on and largely mirrors the processes used by state and federal regulatory agencies in rulemaking. Most protocols start with the preparation of an Issues Paper that evaluates the feasibility and desirability of developing a protocol (or set of protocols) for a particular project type. It assesses possible issues with developing a standardized protocol for the project type, including an evaluation of potential approaches to GHG emissions quantification; exploration of options for defining eligible project activities; evaluation of approaches to setting project boundaries; and assessment of the availability of datasets and other pertinent information. Issues papers are prepared by researching existing sector methodologies and datasets and consulting sector experts.

Upon their completion, these papers are posted to the Reserve's website and made available to the public for review. Project types that appear to hold promise as GHG emission reduction activities and that lend themselves to the use of performance-based standards are then moved forward for broader stakeholder engagement and possible protocol development.

The first step in this process is to convene a public stakeholder workshop at which the project type and the key challenges to protocol development are raised. These workshops are free, open to the public, and widely announced. For those project types that the Reserve intends to craft a protocol, a voluntary multi-stakeholder workgroup is established. It is comprised of representatives of industry, government agencies, environmental organizations, and academia. Such workgroups are large enough to ensure broad representation but small enough to allow for dialogue and consensus-building. The Reserve staff manage these workgroups in the development of a draft project protocol.

Once a draft protocol is completed, the Reserve engages expert stakeholders and the public starting with a public workshop at which the draft protocol is described in detail and ideas and comments are solicited. Targeted questions may be asked and guidance or recommendations on specific topics within the protocol may be solicited. Such workshops initiate a formal public review and comment period of at least thirty days that is very similar to a regulatory notice and comment process. At the conclusion of the comment period, all comments received are posted to the Reserve website and are compiled into a single document. The Reserve staff, together with the workgroup members, review these comments and modify the draft protocol as appropriate and prepare written responses.

A final draft protocol that incorporates expert and public comments and that includes all comments and responses is then scheduled for public adoption by the governing board of the California Climate Action Registry which, unlike most nonprofit boards, meets in open, public sessions and provides opportunity for public comment. Finally, once adopted, all protocols are publicly available and the Reserve continues to solicit public comment and feedback as they are put into actual use. As practical experience is gained and as the state of science progresses, the protocols are revised from time to time using this same multi-stakeholder process.

How the Reserve Ensures Verifiability and Enforceability

Verification

Standards or protocols, no matter how rigorous and transparent they may be, are only effective if they are strenuously and consistently enforced. To ensure that the Reserve's protocols are actually being followed in the development and implementation of emission reduction projects, the Reserve provides a Project Verification Protocol for each of its protocol types that lays out our prescriptive requirements for how verification activities are to be conducted.

To verify project activities, the Reserve relies on independent, third-party verification bodies that it trains, accredits, and assiduously oversees. The Reserve is now working with the American National Standards Institute (ANSI) to assist with its verification program and to ensure that Reserve-accredited verification bodies (and their individual verifiers) are International Standards Organization (ISO) compliant. ANSI ensures that verification bodies are approved per ISO and the Reserve ensures that each demonstrates competency in each project type.

In order to verify projects listed or registered with the Reserve, an individual verifier must be employed by or subcontracted to an accredited verification body and be properly trained to verify projects of the appropriate type. The Reserve has developed and implemented a training curriculum for GHG emission reduction project accounting and for each of its project protocols. Verifiers must demonstrate competency by successfully passing an examination in order to be accredited by the Reserve and not all verifiers are approved to verify all project types. Similarly, the verification body itself must be accredited and eligible to conduct verifications for specific project types.

Once trained and accredited, verifiers and verification bodies receive direct oversight by the Reserve and ANSI in three distinct ways: reviewing conflict of interest, conducting random field and desk audits of their verification activities, and reviewing and assessing verification opinions to ensure accuracy.

For every project that it seeks to verify, the verification body is first required to submit a Conflict of Interest disclosure document to the Reserve that details any pre-existing contractual relationships between the verification body and the project developer. The Reserve carefully assesses these relationships and rates their potential to create a conflict of interest. Low risk conflicts are required to be disclosed and medium risk conflicts must be mitigated. Verification bodies with a high risk of conflict of interest for a project are precluded from conducting verification of such projects.

Additionally, to ensure that verification activities are being properly undertaken in conformance with the Reserve's Project Verification Protocols, the Reserve and ANSI conduct regular random inspections and audits of verification activities. The Reserve also carefully reviews every verification opinion submitted to ensure its conformity with the Verification Protocol and its completeness and accuracy in the quantification of the project's emission reductions. Only once the Reserve is satisfied that a project has been properly verified does it register the project and issue CRTs.

Enforceability
The Reserve imposes a number of contractual and other obligations on program participants to ensure that its system retains integrity and that ownership of emission reductions is transparent.

The Reserve's approach to compensating for reversals of reductions from sequestration projects is discussed above. Enforceability also relates, however, to the legal enforceability of claimed emission reductions.

As part of submittal of a project to the Reserve, project developers must submit a legally-enforceable Attestation of Title form[14] indicating that they have exclusive rights to the GHG reductions or removals associated with the project and for which the Reserve will issue CRTs. The Attestation of Title stipulates that GHG reductions or removals for which CRTs are issued will not be registered on another system or claimed as an offset outside of the Reserve. These documents are part of the public record for each project and are used to prevent the double counting or double registration of any project. Additionally, participants in the Reserve program are required to sign and submit a legally-enforceable Terms of Use document that details the warranties, representations, and covenants of the program.

A key element to ensuring that ownership of CRTs is clear and enforceable is through the robust registration and tracking system that the Reserve has implemented. For verified and registered projects, this system issues a unique serial number for each CRT that provides clear information about the emission reduction type, location, and vintage. The Reserve system then allows owners to transfer specific serial numbered CRTs to purchasers or to retire them. This web-based system includes advanced security features such as encryption and electronic auditing to prevent fraud or abuse, and is built on a robust platform that has handled more than a billion similar transactions in other environmental commodity markets without error.

Finally, the Reserve system is open and transparent, allowing free public access to view all account holders, projects and project documentation; research serialized CRTs; and generate system reports. This openness provides a public check on the activities within the system to further prevent fraudulent claims or other system abuses.

Two Examples of How the Climate Action Reserve Operates

As described, the Reserve has adopted 6 project protocols and is currently working on several other project types and on extending the use of our protocols into Mexico. We continue to train, accredit and oversee verification bodies, and we operate a robust project offset registration and tracking system. To date, we have registered 6 projects representing the issuance of over 600,000 metric tons of CO_2-e emission reductions as CRTs. We have 36 additional projects that have been submitted to us from 18 U.S. states, and we expect to have registered more than 1.5 million CRTs by the end of 2009 and nearly 4 million by the end of 2010. To better understand how the system operates, two examples are provided below that describe the establishment of a performance-based threshold and how we ensure broad stakeholder engagement.

Determining a Performance-Based Threshold
In the development of a protocol for the capture and combustion of methane from livestock waste management operations, the Reserve evaluated the establishment of a performance-based threshold for determining the additionality for this project type. The analysis to establish a Performance Standard for the Manure Management Project Protocol was undertaken by expert

technical consultants at the end of 2006. The analysis culminated in a paper that provided a Performance Standard recommendation to support the Reserve's protocol development process.

The purpose of a Performance Standard is to establish a threshold that is significantly better than average GHG production for a specified service, which, if met or exceeded by a project developer, satisfies the criterion of "additionality." The California Registry's project protocol focuses on the following direct emission reduction activity: capturing and combusting methane from managing livestock manure. Therefore, in this case the methane emissions correspond to GHG production, and manure treatment/storage correspond to the specified service.

The analysis to establish the Performance Standard evaluated U.S. and California-specific data on dairy and swine manure management systems. Based on this analysis, it was determined that such systems are not required by regulation and that, in fact, are used in fewer than 0.10% of swine and dairy operations in the U.S.[15] The overwhelming absence of such systems suggests that very significant financial and technical barriers exist to their implementation, and thus can be inferred that the implementation of such technology, if it is to occur at all, is attributable to the financial incentives provided by a GHG market. That is, implementation of this high-performing technology is in it itself deemed to be additional to "business as usual" circumstances and, therefore, qualifies under the Climate Action Reserve program as an eligible project activity.

Engaging Stakeholders in the Protocol Development Process
In October 2007, California Air Resources Board adopted the Reserve's Forest Protocol for the purposes of recognizing early voluntary actions under AB32[16]. In taking this action, the Board requested that CCAR reconvene a forest protocol workgroup to expand the types of forest ownership lands on which the protocol could be applied. At the same time, the Reserve sought to expand the protocol for use throughout the U.S. and to update the science and related components of the protocol. Thus, a Forest Project Protocol Workgroup was convened in November 2007 to guide this update process. The workgroup was comprised representatives of state and federal government representatives, including both forestry and environmental agencies, small and large private forest landowners including land trusts and timber companies, environmental organizations, academics with expertise in forestry, and other experts.[17]

At the outset of this effort, the Reserve held a public workshop to solicit stakeholder input on potential updates needed for the Forest Protocol and to focus the efforts of the workgroup. Subsequent to this workshop, the workgroup established a work program and committed to meeting every three weeks in day-long sessions to discuss and seek consensus on both technical and policy issues. These workgroup meetings were open to the public.

The workgroup also established committees to cover specific topic areas and these committees met separately between workgroup sessions. Over the course of their 15-month process, the workgroup held three public workshops to update the public on the progress of drafting the protocol and to solicit additional comment on the direction that the workgroup was taking. This process resulted in a draft protocol document that was released in December 2008 for public review and comment.

The Reserve received 40 sets of public comments demonstrating broad public engagement in this effort, and these are posted on the Reserve website. These comments have been categorized and compiled into a single document and every comment will receive a written response that will be part of the public record for the protocol. The Reserve now expects to release its final draft to the public by April 2009 for additional review and comment, and to adopt the protocol by the end of May 2009.

This time- and resource-intensive process is vital to building consensus, ensuring transparency, and establishing a credible protocol that is broadly accepted as best practice for quantifying the GHG benefits of forest project activities.

Conclusion

As the United States contemplates legislation to address the serious threat of climate change, one of the approaches being given serious consideration is a cap and trade program in which offsets are included. The experience of the Climate Action Reserve has shown that it is possible to design and implement a credible offsets program, but doing so requires that careful attention be paid to the program's structure and individual program elements to establish and maintain program integrity. These elements include setting rigorous program standards, creating and overseeing a strong verification and verifier oversight program, and implementing a transparent yet secure registry system.

The Climate Action Reserve believes that existing credible, compliance-grade efforts can inform and be part of a regulatory program by providing the infrastructure necessary for a regulatory program to be quickly implemented. Indeed, rather than expend significant time and resources to reinvent existing infrastructure, it may be more effective, efficient, and appropriate for regulatory agencies to instead provide an accreditation and oversight role for credible programs and provide a mechanism for those programs to support the regulatory system.

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[1] California Senate Bill 1771 (Sher, Chapter 1018, Statutes of 2000) as modified and implemented by California Senate Bill 571 (Sher, Chapter 769, Statutes of 2001). These can be found here: http://www.climateregistry.org/resources/docs/legislation/SB1771.pdf and here: http://www.climateregistry.org/resources/docs/legislation/SB527.pdf.

[2] For adoption of the Forest Protocol, see agenda item 07-10-03 on ARB agenda for October 25, 2007 here: http://www.arb.ca.gov/board/ma/2007/ma102507.htm. For Livestock Waste Management and Urban Forestry, see agenda item 08-8-5 on ARB agenda for August 8, 2008 here: http://www.arb.ca.gov/board/ma/2008/ma092508.htm. The forest protocol comprises three distinct project types (reforestation, improved forest management, and avoided forest conversion) and is considered to be three separate protocols in this context.

[3] See October 2008 statement of the State of Pennsylvania Department of Environmental Protection concurring with recommendations of the Climate Change Advisory Committee to recognize the Climate Action Reserve here: http://www.depweb.state.pa.us/energy/cwp/view.asp?a=1532&q=542258

[4] For information see: http://www.rggi.org/home

[5] For information on the California Scoping Plan see: http://www.arb.ca.gov/cc/scopingplan/document/psp.pdf and for the Western Climate Initiative, see: http://www.westernclimateinitiative.org/

[6] "Ensuring Offset Quality: Integrating High Quality Greenhouse Gas Offsets Into North American Cap-and-Trade Policy," July 2008, Offset Quality Initiative, at http://www.offsetqualityinitiative.org/pdfs/OQI_Ensuring_Offset_Quality_7_08.pdf.

[7] The following discussion and footnote are adapted from "Linking Markets for GHG Reductions: Can it be Done?", March 2007, Derik Broekhoff, Senior Associate, World Resources Institute. The concept of emission offsets originated under the "New Source Review" program established by the United States Clean Air Act of 1977. Under this program, offsets are required to be "real, creditable, quantifiable, permanent, and federally enforceable." These basic criteria have been modified and adopted in general form under a variety of other offset programs, including programs for carbon offsets. The "surplus" criterion is generally added to distinguish offset reductions from reductions that would occur for other reasons and in the GHG context is usually termed as "additional". The criteria cited in this testimony are the most frequently cited and are, for example, included in the California Climate Change Scoping Plan as adopted by the State of California Air Resources Board on December 11, 2008 which is here http://www.arb.ca.gov/cc/scopingplan/document/psp.pdf.

[8] Adapted from "Testimony of Derik Broekhoff, Senior Associate, World Resources Institute, Testimony to the House Select Committee on Energy Independence and Global Warming, U.S. House of Representatives, July 18, 2007"

[9] The Program Manual is located here http://www.climateregistry.org/resources/docs/reserve/Climate_Action_Reserve_Program_Manual_Feb_23_2009.pdf

[10] The Terms of Use are located here: http://www.climateregistry.org/resources/docs/offsets/car-terms-of-use-07.14.08.pdf and the Operating Procedures may be found here: http://www.climateregistry.org/resources/docs/offsets/operatingprocedures.pdf

[11] Assembly Bill 32, the Global Warming Solutions Act of 2006 (Núñez, Chapter 488, Statutes of 2006) which is found here: http://www.leginfo.ca.gov/pub/05-06/bill/asm/ab_0001-0050/ab_32_bill_20060927_chaptered.pdf.

[12] For information on CDM see http://cdm.unfccc.int/index.html and for a discussion on performance-based approaches, see "Expanding Global Emissions Trading: Prospects for Standardized Carbon Offset Crediting," International Emissions Trading Association, prepared by Derik Broekhoff, World Resources Institute, November 15, 2007

[13] For information on the U.S. EPA Climate Leaders program see http://www.epa.gov/climateleaders/index.html

[14] Form is located here http://www.climateregistry.org/resources/docs/offsets/Project-registration-attestation-of-title.pdf and completed forms are made public through the Reserve

[15] Summary information from the study can be found in Appendix C of the Protocol here: http://www.climateregistry.org/resources/docs/protocols/project/livestock/CCARLivestockProjectReportingProtocol2.1.pdf

[16] See agenda item 07-10-03 on ARB agenda for October 25, 2007 here http://www.arb.ca.gov/board/ma/2007/ma102507.htm

[17] The workgroup is comprised of representatives from: U.S. Forest Service, U.S. EPA, California Air Resources Board, California Department of Forestry and Fire, California State Parks, California Forestry Association, Sierra Pacific Industries, Green Diamond Resources, Beaty & Associates, Pacific Forest Trust, Scientific Certification Systems, Winrock International, World Resources Institute, Environmental Defense Fund, The Nature Conservancy, and the University of California.

Mr. MARKEY. Thank you, Mr. Gero, very much.

Our next witness is Ms. Emily Figdor, who is the director of the Federal Global Warming Program at Environmental America.

We welcome you, Ms. Figdor. And whenever you are ready, please begin.

STATEMENT OF EMILY FIGDOR

Ms. FIGDOR. Thanks so much for the opportunity to share my views regarding the role of carbon offsets in climate legislation.

My name is Emily Figdor, and I am the director of the Federal Global Warming Program at Environment America. Environment America is a federation of State-based, citizen-funded, environmental advocacy organizations with more than 750,000 members and activists in all 50 States.

Last week, President Obama issued a historic call for Congress to send him legislation that, quote, "places a market-based cap on carbon pollution and drives the production of more renewable energy in America." The central objective of such legislation must be to reduce global warming emissions fast enough to avoid dangerous impacts, such as a massive rise in sea levels that would inundate coastal areas.

To avoid what some climate scientists call "the tipping point," our view is that the United States must cut its global warming emissions by at least 25 percent below 1990 levels by 2020 and by at least 80 percent below 1990 levels by 2050.

The number-one imperative of U.S. climate policy must be to achieve science-based cuts in pollution. Offsets, however, provide less certain reductions in emissions, thus jeopardizing our ability to achieve pollution reduction targets. This is because emission allowances and offsets are fundamentally different. An allowance represents a unit of emission. If a facility decides to emit carbon dioxide, it must hold an allowance. An offset, on the other hand, represents a unit of pollution not emitted. It is of equal value to an allowance only if it can be judged with certainty that the pollution would have been emitted but was not and that the emission reduction resulted from the incentive provided by the offset.

To illustrate the difference, consider two people trying to lose weight. One person decides to meticulously count the calories of the foods he eats, with the goal of reducing his intake each day. The second person, however, counts the calories of the foods he thinks he would have eaten but did not because he was on a diet. You can imagine which of these two will be more likely to actually shed a few pounds.

Or consider a situation in which rising natural resource prices bring an industrial facility abroad to the verge of shutdown, a step that would reduce emissions. A U.S. utility might agree to pay the factory owner if she shuts down the facility, thus generating offsets that the utility can use to expand its operations. The key question is, would the factory have shut down anyway? If the answer is yes, no additional emission reductions have been gained. Indeed, the offset program would result in an increase in overall emissions versus business as usual.

Determining additionality requires crystal-ball gazing, and so is impossible to know with certainty. At the same time, the worth-

while goals promoted by many offset proponents—to protect tropical forests and sequester more carbon in plants and soils in the United States—can be achieved without jeopardizing the environmental integrity of the overall program.

Specifically, Congress could set aside a small portion of auction revenue for these two purposes. Emission reductions from these set-aside programs would be in addition to those required by capped sectors under the cap-and-trade program. As a result, problems such as leakage and additionality would not jeopardize our pollution reduction goals.

Because offsets deliver a less certain emission reduction, they should not be included in climate legislation. Nonetheless, if offsets are, in fact, considered, the levels of the caps on pollution must be stringent enough and the offsets limited enough to minimize the impact that lower-certainty emission reductions have on our ability to achieve pollution reduction targets.

Offsets should be strictly limited to no more than 5 percent of the allowances, as proposed by Representatives Dingell and Boucher in the early years of the offset program in their draft climate bill. Unlike in their bill, however, this percentage should not increase over time unless and until offsets can be proven to deliver equivalent emission reductions to actions taken within the bounds of a cap-and-trade program.

To provide the highest-quality offsets possible, Congress should require EPA to consult an independent science advisory board in establishing and periodically reviewing domestic and international offset programs. In addition, due to the inherent problems in determining additionality, Congress should discount offset credits.

Finally, if international offsets are permitted, national-level accounting and administrative methods should be required. And there should be some conditionality on their use to enable the program to serve as a lever to encourage developing countries to substantially reduce their emissions below business as usual.

In conclusion, the central objective of U.S. climate policy must be to reduce global warming emissions fast enough to avoid dangerous impacts. Because offsets provide less-certain reductions in emissions, they would jeopardize our ability to achieve pollution reduction targets and should not be included in climate legislation.

Thank you.

[The prepared statement of Ms. Figdor follows:]

Testimony of Emily Figdor
Federal Global Warming Program Director
Environment America
Before the Subcommittee on Energy and the Environment
House Energy and Commerce Committee
The Role of Offsets in Climate Legislation
March 5, 2009

Introduction
Thank you for the opportunity to share my views regarding the role of carbon offsets in climate legislation. My name is Emily Figdor, and I am the director of the Federal Global Warming Program at Environment America. Environment America is a federation of state-based, citizen-funded environmental advocacy organizations, with 750,000 members and activists in all 50 states. My testimony today draws on our experience with offsets in the design of climate policies at the state, regional, and federal levels.

Last week, President Obama issued a historic call for Congress to send him legislation that "places a market-based cap on carbon pollution and drives the production of more renewable energy in America." The President explained that such legislation is needed to "truly transform our economy, protect our security, and save our planet from the ravages of climate change."[1]

I commend Chairmen Waxman and Markey for their years of leadership on global warming, renewable energy, energy efficiency, and energy security and for their expeditious work so far this year to craft and lay the groundwork to advance comprehensive global warming and energy legislation this spring. The job of responding to the President's call could not be in more able hands.

However, the challenges before us – global warming, energy security, the flagging economy – are of historic scale, and the response by Congress must be swift, bold, and well-designed to result in the transformational changes that the President envisions.

My testimony today will focus on the urgent need to achieve real and sustained cuts in emissions of the pollutants that are fueling global warming; the risks that carbon offsets, if included in a climate bill, would pose to achieving such cuts; and alternative policy mechanisms that could incentivize activities promoted by proponents of offsets, such as increasing carbon storage in trees and soils, without jeopardizing the environmental integrity of the overall program.

Science Demands Deep Cuts in Pollution
The impacts of global warming on human and natural systems are now being observed nearly everywhere. In 2007, the Nobel Prize-winning U.N. Intergovernmental Panel on Climate Change (IPCC) predicted serious risks and damage to livelihoods, societies, infrastructure, species, and ecosystems unless future warming is reduced.[2] So far this decade, emissions, warming, and impacts, such as ice melt and sea level rise, have all been at the upper end of IPCC projections.[3]

Last year, for example, the U.S. National Snow and Ice Data Center announced that summer Arctic sea ice reached the second-lowest level ever recorded, following the record-breaking

2007 summer.[4] This observed rapid Arctic melting has already far outpaced IPCC worst-case scenario projections that summer Arctic sea ice could disappear almost entirely by the latter part of this century.[5] Now, scientists from NASA and other agencies warn that Arctic summers could be nearly ice-free within the next five years.[6]

Urgent action is needed to reduce the emissions that are causing global warming.

The United States has committed, as a signatory to the 1992 United Nations Framework Convention on Climate Change, to the goal of preventing "dangerous" global warming.[7] While what constitutes "dangerous" remains undefined in the law and a matter of subjective judgment, warming of more than 2 degrees Celsius over the pre-industrial level[i] is considered by many scientists and policymakers as a rough threshold between damaging and catastrophic global warming.[8] Other scientists warn that even this level of warming would be too much and could pose great risks to humans and natural systems.[9]

To have a reasonable chance (50-50) of keeping temperatures from increasing by more than 2 degrees Celsius, current science indicates that the world must stabilize the atmospheric concentration of global warming pollutants (in carbon dioxide equivalent) near 450 parts per million (ppm).[10] According to the IPCC, to stabilize global warming pollutants at this level (and allowing for a temporary 50 ppm overshoot), developed countries as a whole must cut their emissions by 25-40 percent below 1990 levels by 2020 and by 80-95 percent below 1990 levels by 2050,[ii] and major developing countries also must act within this timeframe.[11]

Role of Offsets

The central objective of climate legislation must be to reduce global warming emissions fast enough to avoid dangerous impacts. Of primary importance are the levels of the caps on global warming pollution. The caps should be based on the most recent science and force the development and deployment of clean technologies.

Offsets allow emitters covered by the caps to comply by paying for emission reductions at facilities or for activities not covered by the program. Offsets could be issued for actions taken to reduce emissions domestically in areas of the economy not covered under the cap or for projects undertaken overseas. For example, the owner of a U.S. power plant might receive an offset by paying a farmer to set aside croplands from agricultural production to rebuild carbon in the soil and vegetation, thereby enabling the power plant to emit more carbon dioxide pollution.

Proponents of offsets argue that including offsets in a cap-and-trade program could reduce the cost of the program by allowing some compliance to take place through lower cost means, such as through overseas programs. Proponents also argue that offsets are needed to drive emission reductions in areas of the economy where the implementation of a cap will be difficult, and that the availability of offsets will drive innovation in the development of new emission-reducing technologies.

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[i] This temperature increase is equivalent to 3.6 degrees Fahrenheit over the pre-industrial level or about 2 degrees Fahrenheit over the amount of warming that has already occurred.

[ii] The low-end of these ranges are equivalent to a 35 percent reduction from today's (2006) levels by 2020 and an 83 percent reduction from today's levels by 2050.

However, offsets are highly problematic when it comes to achieving what must be the number one imperative of U.S. climate policy: achieving the deep and verifiable reductions in domestic emissions that are necessary to prevent the worst impacts of global warming.

Offsets are problematic because they (1) provide less-certain reductions in emissions, thus eroding the environmental integrity of the program; (2) delay the transition to clean technologies in capped sectors; and (3) reduce the potential for the American people to receive the "co-benefits" of domestic emission reductions, such as cleaner air and improved energy security. Moreover, many of the worthwhile goals that proponents of offsets promote – such as increasing carbon storage in trees and soil – can be achieved without jeopardizing the environmental effectiveness of the cap, such as through allowance set-aside programs.

Offsets Undermine Pollution Targets

Exchanging offsets for emission allowances within a cap-and-trade program is akin to trading apples for oranges. An allowance represents a unit of emissions. If a facility decides to emit carbon dioxide, it must hold an allowance. An offset, on the other hand, represents a unit of pollution *not emitted*. It is of equal value to an allowance only if it can be judged with certainty that the pollution would have been emitted, but was not, and that the emission reduction resulted from the incentive provided through the offset program.

To illustrate the difference, consider two people trying to lose weight. One person decides to meticulously count the calories of the foods he eats, with the goal of reducing his intake each day. The second person, however, counts the calories of the foods he thinks he *would have* eaten that day but did not because he was on a diet. You can imagine which of the two will be more likely to actually shed a few pounds.

In practice, offset programs have a terrible track record in delivering real, verifiable reductions in global warming pollution. A recent report by Stanford University estimates that "between a third and two-thirds" of offsets under the Kyoto Protocol's Clean Development Mechanism (CDM) do not represent real emission cuts.[12] This analysis of the international experience with offsets concludes that "any [domestic or international] offset market of sufficient scale to provide substantial cost-control for a cap-and-trade program **will involve substantial issuance of credits that do not represent real emissions reductions**" (emphasis added).[13]

Similarly, a 2008 Government Accountability Office (GAO) report on offsets concludes that "the use of carbon offsets in a cap-and-trade system can undermine the system's integrity, given that it is not possible to ensure that every credit represents a real, measurable, and long-term reduction in emissions....[C]arbon offsets involve fundamental trade offs and may not be a reliable long-term approach to climate change mitigation."[14]

The bottom line is that ensuring offsets deliver emission reductions that are of the same quality as those achieved within the bounds of a cap-and-trade program is extremely difficult, if not impossible. Offsets that fail to meet key criteria – that they are real, additional, permanent, quantifiable, and enforceable – provide no environmental benefit, thus undermining the emissions cap. To fully understand the challenge posed by offsets, I will briefly review these criteria.

Real
A "real" emission reduction reduces emissions *in the aggregate* globally – that is, a program does not merely shift emissions from one facility, jurisdiction, or country to another. Consider a decision to reduce production at an industrial facility abroad or to protect a forest from development – both valid ways to reduce or sequester carbon dioxide. However, if the owner of the factory merely shifts production to another facility elsewhere, or if the developer merely levels a different forest, nothing has been gained. Such "leakage" of emissions benefits is a major problem because carbon dioxide is a global pollutant.

Additional
Additional emission reductions represent those that go beyond business as usual. They are reductions that would not have occurred but for the presence of offsets.

Determining additionality requires the development of accurate forecasts that predict what would have happened under business-as-usual conditions and then comparing them with the actual emission reductions achieved. The reality is that this process requires crystal ball-gazing. Consider a situation in which rising natural resource prices bring an industrial facility abroad to the verge of shutdown – a step that would reduce carbon dioxide emissions. A U.S. utility might agree to pay the factory owner if she shuts down the facility, thus generating credits that the utility can use to expand its own operations.

The key question in the above scenario becomes: Would the factory have shut down anyway in the absence of the compensation from the utility? If the answer is yes, no surplus emission reductions have been gained. Indeed, by allowing credits generated from an illusory emission reduction to be used to increase emissions from the power plant, the offsets program results in an *increase in overall emissions versus business as usual.*

Unfortunately, determining with certainty what emissions would have occurred in the absence of compensation is difficult, if not impossible. For this reason, additionality has been a major problem in the CDM, the world's largest carbon offset program. In its recent review of the program, the GAO commented, "This concept of additionality is fundamental to the credibility of the CDM because only projects that are additional will lower emissions beyond what would have occurred without the program. Accordingly, the parties to the protocol have implemented a rigorous project approval process with an extensive set of requirements to ensure that credits received through the CDM represent real and additional emission reductions. However, because additionality is based on projections of what would have occurred in the absence of the CDM, which are necessarily hypothetical, it is impossible to know with certainty whether any given project is additional."[15]

Permanent
Many efforts to reduce or sequester global warming emissions are, by their very nature, temporary. For instance, planting a forest absorbs carbon dioxide from the atmosphere, but it will eventually be released again when the trees die due to forest fire, pest infestation, or some other cause. Such temporary programs should only receive credit as offsets for the period in which they function to reduce net global warming emissions.

Quantifiable
The emission reductions delivered by an offset measure must be measurable using generally accepted and replicable techniques. Biological sequestration offset projects present particular challenges to quantify, since variations exist across tree species, ages, soil

conditions, geographic locations, and management practices.[16] Developing and implementing accounting standards would be time- and resource-intensive, with no foolproof guarantee of accuracy. In addition, quantification methods must identify and discount any emissions reductions that are shifted to other locations (leakage), that would have occurred anyway (non-additional), or that are temporary (non-permanent).

Enforceable
The Environmental Protection Agency (EPA) or another federal agency must be able to take enforcement action against entities that deliver fraudulent or illusory offsets, including actions affecting a project located in another nation. Third-party verification might play a role, but even then the government would need to create systems to watchdog the third parties, who are not elected or appointed officials and not directly accountable to the public.

Each of the above problems with offsets can be resolved or mitigated – but only at a price. The price is administrative complexity, bureaucracy, and high transaction costs that reduce the economic benefits of offsets.

Offsets Delay America's Transition to Clean Energy
Even if offsets were to deliver equivalent results in terms of reducing net global warming emissions, they would delay America's transition to a clean energy economy.

President Obama has explained that clean energy technologies are the wave of the future and that if we want America to be a leader in this emerging global market, we need to take action now. Last week, in his Address to the Joint Session of Congress, he stated, "We know the country that harnesses the power of clean, renewable energy will lead the 21st century. And yet, it is China that has launched the largest effort in history to make their economy energy efficient. We invented solar technology, but we've fallen behind countries like Germany and Japan in producing it. New plug-in hybrids roll off our assembly lines, but they will run on batteries made in Korea. Well I do not accept a future where the jobs and industries of tomorrow take root beyond our borders – and I know you don't either. It is time for America to lead again."[17]

A strong cap on global warming pollution provides an enormous opportunity for American businesses and industries to adjust to the true costs of goods and services, making our economy more efficient and spurring innovation and new technology. But to the extent that offsets are used to make reductions elsewhere instead, the opportunity to transform our industries at home is diminished.

Job Creation
A variety of studies have pointed to the job creation benefits of renewable energy, which could play a significant role in reducing global warming emissions. A study by the Renewable Energy Policy Project estimated that wind and solar power offer 40 percent more jobs per dollar spent than coal.[18] A 2008 study by the American Solar Energy Society estimated that America could create 21 million additional jobs in renewable energy and energy efficiency by 2030 through aggressive public policies to promote clean energy.[19] Investing in the technologies needed to reduce emissions domestically will create jobs here at home.

Technology Development
In addition to shifting job creation benefits elsewhere, the technological advancement that would result from the drive to reduce global warming emissions and move to a clean energy economy here at home also would be diminished with an offset program.

America has lost its role leading the development and deployment of clean energy technologies. For instance, solar electricity generation and water heating were invented in the United States but have been used to a much greater extent in Germany and China, respectively.

America should take full advantage of the opportunity to renew America's technological leadership and keep our energy industries at the forefront of global competitiveness.

Innovation
In addition to jobs and technology advancement, general innovation in the United States will be aided by avoiding the use of an offset program. Innovation is the discovery of new processes that increase the efficiency of economic production and has a similar effect to invention. A classic example of innovation is Henry Ford's mass production line, which enabled low-cost production at large scales. Innovation will help the American economy recover and remain at the forefront of global efficiency, but the effort could be stymied by an offset program that pushes innovation opportunities elsewhere.

Offsets Reduce Co-Benefits of Cutting Fossil Fuel Use
Offset programs can redirect the ancillary benefits that go along with reducing global warming pollution to other countries. These benefits include improved air quality, reduced health-damaging pollution, and improved energy security.

For example, a strategy to meet a carbon cap could involve improving the efficiency or decommissioning some carbon-intensive coal-fired power plants. Since coal combustion is a major source of other harmful pollutants, including mercury and particulate matter ("soot"), improving the efficiency or decommissioning the plant would yield important public health benefits.

A study by Resources for the Future estimated that a $25 per ton price on carbon dioxide from electricity generation (not allowing for offsets) would generate approximately $12-14 per ton of ancillary economic benefits through reduced public health expenditures and reduced need for utilities to invest in emission control equipment. The ancillary benefits were estimated to be about equal to the anticipated marginal cost of reducing carbon dioxide emissions.[20]

Other Policies to Sequester Carbon in Forests and Soils
At the same time, the worthwhile goals promoted by offset proponents can be achieved through other policy avenues without jeopardizing the ability to achieve the caps on pollution. First and foremost is the need to halt tropical deforestation, which contributes about 20 percent of worldwide global warming emissions.[21] Reducing emissions from deforestation and forest degradation in developing countries (REDD) must be a major component of the global effort to prevent warming from exceeding 2 degrees Celsius and thereby reducing the risks of dangerous global warming. Incentivizing farmers and land managers in the United States to sequester carbon dioxide in soils and forests also will be a critical part of the solution.

A set-aside of auction revenue is the best way to support these goals. The reductions would be *in addition* to the reductions required by capped sectors under the cap-and-trade program. Therefore, problems such as leakage and additionality would not risk jeopardizing our pollution-reduction goals and increasing net global emissions. These problems will be especially significant in the next 10 years, before many countries establish national programs with national emission baselines and before we have more experience with international carbon markets.

In the case of tropical deforestation, auction revenue would enable tropical countries to immediately reduce their carbon emissions from forest clearing. A fund to reduce tropical deforestation could be a very effective way to make large reductions in global warming emissions with relatively modest funding. According to the Union of Concerned Scientists, a few percent of total allowance value would generate an estimated $5 billion annually in 2020, and that amount would pay for reductions equivalent to 10 percent of U.S. 1990 emissions. If other countries contributed similar proportions of their allowance value (e.g., the European Commissions is recommending 5 percent), we could raise $20 billion annually in 2020, which could cut deforestation in half.[22]

Parameters for Offset Programs if Included

Because of their inherent risks and trade-offs, offsets should not be included in a federal climate program – at least not until the program has matured and proven effective.

Strict Quantity Limits

Nonetheless, if offsets are considered, the levels of the caps on pollution must be stringent enough – and the offsets limited enough – to minimize the impact that lower certainty emissions reductions have on our ability to achieve science-based pollution-reduction targets. Offsets should be strictly limited to no more than 5 percent of the allowances, as proposed by Representatives Dingell and Boucher in the early years of the offset program in their draft climate bill. Unlike in their bill, however, this percentage should not increase over time unless and until offsets can be proven to deliver equivalent results to actions taken within the bounds of a cap-and-trade program at least in terms of reducing net global warming emissions.

Even with rigorous safeguards to help ensure the quality of offsets, allowing large amounts of offsets in the program will create pressure on regulators over time to approve low integrity offset measures if higher quality offsets prove inadequate to meet demand.

Strict Quality Limits

An independent Federal Advisory Committee Act-charted Science Advisory Board should advise EPA in establishing and periodically reviewing the offset program, including both domestic and international offsets, to provide the highest quality offsets possible. This model has worked well in ensuring that EPA is using the best scientific and technical information to develop and review other Clean Air Act programs, such as the National Ambient Air Quality Standards, and should be a model for developing and maintaining a high quality offset program.

Congress must ensure that EPA requires any domestic and international offsets to meet conservative and rigorous criteria, including *financial additionally* – an independent audit to ensure that an offset program is breaking down a genuine market barrier preventing a

pollution reduction from occurring and giving credit only for the contribution of offset funding to the overall pollution reduction.

In addition, due to the inherent problems in determining additionality, Congress should discount offset credits. For example, with a discount rate of 30 percent, a project that is expected to reduce carbon dioxide by 100 metric tons would only receive 70 credits. While discounting cannot help screen out non-additional projects, it can help mitigate the environmental consequences of non-additional offsets.

Finally, if international offsets are permitted, there should be some conditionality on their use – such as gradually requiring more stringent baselines for project host countries or requiring countries to take "comparable action" by a date certain – that would enable the program to serve as a lever to encourage developing countries to substantially reduce their global warming emissions below business as usual.

Conclusion

The science is clear that deep cuts in global warming pollution are urgently needed if we hope to stave off dangerous global warming.

Offsets provide less-certain reductions in emissions, thus eroding the environmental integrity of the program and potentially jeopardizing our ability to achieve science-based reductions in emissions.

Offsets also delay the transition to clean technologies in capped sectors – at a time when President Obama is calling for transformational changes in our energy future.

Finally, offsets reduce the co-benefits of a carbon cap, including improved air quality, better energy efficiency, and increased economic output.

Because of their inherent risks and these trade-offs, offsets should not be included in a federal climate program – at least not until the program has matured and proven effective. If, however, offsets are included, the levels of the caps on pollution must be stringent enough – and the offsets limited enough – to minimize the impact that lower certainty emissions reductions have on our ability to achieve needed pollution cuts. The program also must be designed with great care, including establishing an independent Science Advisory Board to assist EPA in developing and periodically reviewing both domestic and international offsets and discounting offset credits to help mitigate the environmental consequences of non-additional offsets.

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[2] Intergovernmental Panel on Climate Change (IPCC), *Climate Change 2007: Synthesis Report*, 2007.
[3] W. L. Hare, "A Safe Landing for the Climate," *2009 State of the World: Into a Warming World*, 2009.
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[10] IPCC, "Summary for Policymakers," *Climate Change 2007: Mitigation of Climate Change*, 2007, 22.

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[14] U.S. Government Accountability Office, *International Climate Change Programs: Lessons Learned from the European Union's Emissions Trading Scheme and the Kyoto Protocol's Clean Development Mechanism*, November 2008, 8.

[15] Ibid., 41.

[16] Ross W. Gorte and Jonathan L. Ramseur, Congressional Research Service, *Forest Carbon Markets: Potential and Drawbacks*, RL345603, July 2008.

[17] Remarks of President Barack Obama – As Prepared for Delivery, Address to Joint Session of Congress, 24 February 2009.

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[20] Dallas Burtraw et al, Resources for the Future, *Ancillary Benefits of Reduced Air Pollution in the United States from Moderate Greenhouse Gas Mitigation Policies in the Electricity Sector*, December 2001.

[21] Doug Boucher, Union of Concerned Scientists, *Out of the Woods: A Realistic Role for Tropical Forests in Curbing Global Warming*, December 2008.

[22] Ibid.

Mr. MARKEY. Thank you, Ms. Figdor, very much.

Our next witness is Mr. Graeme Martin. He is the manager of business development of environmental products for Shell Energy North America.

We welcome you, sir. Whenever you are ready, please begin.

STATEMENT OF GRAEME MARTIN

Mr. MARTIN. Well, good morning, Chairman Markey and members of subcommittee. Thank you for the opportunity to be here today. It is a real honor.

Mr. MARKEY. Could you move the microphone over just a little bit? Thank you.

Mr. MARTIN. Shell was one of the first integrated oil companies to acknowledge the impacts of human activity on the climate, and we believe now is the time to act. The longer we delay, the more stringent the needed measures and the more expensive the compliance. And, in particular, Shell supports cap-and-trade as the surest way to reduce CO_2.

We are members of U.S. Climate Action Partnership, and we helped write the blueprint for legislative action. Shell and USCAP believe offsets are critical to managing the cost of a cap-and-trade program, especially in its early years. In Shell's trading experience, the more offsets you have, the lower the average cost of compliance. So, for this reason, USCAP's offset recommendations are integral to USCAP's support for the aggressive environmental targets referenced in the blueprint.

The USCAP and Shell recommend a limit of 1.5 billion tons of domestic and 1.5 billion tons of international offsets, as we have already heard. We have an initial annual limit set at 2 billion tons combined.

We call for a carbon market board to set the annual limits on offsets. This board will use that authority to avoid economic harm from excessively high allowance prices or increases in the price of natural gas due to fuel-switching.

In addition to cost containment, there are other compelling reasons to use offsets. First, offsets actually reduce emissions. The climate doesn't care where the CO_2 is reduced; reductions from anywhere in the world have the same impact. And some other cost-containment measures may not actually deliver that environmental result.

Second, offsets deliver an environmental value in addition to the CO_2 reduction, including improving habitat water quality and biodiversity at the site where the offsets are created.

Third, offsets drive the deployment of technology at its most reasonable cost. Affordable offsets help companies like ours in the early years invest in the climate technologies that they know they will need in the later years when the targets are much steeper. Shell believes that several key technologies at commercial scale are going to be needed to address climate change, including carbon capture and sequestration and cellulosic ethanol. And we have been working hard to develop these technologies.

Fourth, offsets help prevent the so-called "dash to gas." Without offsets, companies may be forced to switch from CO_2-intensive fuels like coal to cleaner fuels like natural gas. And a move like this

could sharply drive up the cost of natural gas, harming the economy, businesses, and consumers.

Fifth, and finally, international offsets are an excellent tool to encourage developing countries to reduce their own CO_2 emissions. We know it will be a long time before cap-and-trade covers all of the economy in all parts of the world, but we still need to introduce the emissions reduction into the developing world if we really want to tackle climate change. And quality offsets are a good way to encourage this.

USCAP and Shell call for quality offsets developed to strict standards. When we recognize problems with the current international offset system, and we fully support reform of the clean development mechanism. We strongly believe the offsets should be environmentally additional, permanent, measurable, verifiable, and enforceable, as we have heard. Shell is working closely with organizations like the California Climate Action Registry to craft these world-class offset protocols.

We support USCAP's call for the EPA to set a transparent process for crafting offset standards. We believe the EPA should certify these offsets. And we would like to see the U.S. engage assertively in international climate dialogues and lead the effort to reform the international offset program to U.S. standards. We strongly prefer to see one common, internationally accepted standard for all offsets.

So, in summary, abundant quality offsets are key to achieving these stringent targets at the lowest possible cost of the economy. I thank you for your time and am happy to answer any questions.

[The prepared statement of Mr. Martin follows:]

WRITTEN STATEMENT OF

GRAEME MARTIN

Manager of Business Development, Environmental Products
Shell Energy North America

Before the

HOUSE COMMITTEE ON ENERGY AND COMMERCE

SUBCOMMITTEE ON ENERGY AND THE ENVIRONMENT

Hearing on "The Role of Offsets in a Cap and Trade Program"

March 5, 2009
9:30 a.m.
2322 Rayburn House Office Building

Good morning Chairman Markey, Representative Upton and members of the subcommittee. Thank you for holding this hearing and for giving Shell the opportunity to testify on the vital role of offsets in a cap and trade program.

The subcommittee's biweekly hearings are very timely as a new Congress and Administration work to create an economy-wide cap and trade system that achieves aggressive emission reduction targets. During these difficult times, it is particularly important to achieve environmental targets while minimizing the impact on our economy and consumers. Quality offsets that are permanent and can be measured, verified and reported can play a key role in managing the cost of a climate program while helping to achieve environmental goals.

During my testimony today, I will focus on the following points:

1) The role domestic and international offset credits can play in reducing the cost of compliance with a U.S. cap-and-trade program to reduce greenhouse gas emissions.

2) How the availability of offset credits figures into Shell's business planning and compliance strategy.

3) The relationship between the stringency of the targets and timetables for greenhouse gas emission reductions and the nature and scope of any offsets program.

4) The specific recommendations of the U.S. Climate Action Partnership with regard to the use of offset credits under U.S. climate legislation.

5) How can we ensure the integrity and effectiveness of any offset program included in U.S. climate legislation.

About Shell

Before I begin, I would like to provide a little background about the Royal Dutch Shell companies ("Shell"). We are an integrated oil and gas group of companies dedicated to meeting ever-growing energy demand efficiently and responsibly. We put safety, sustainability, the global search for viable new energy sources and innovative technologies at the heart of how we do business.

In addition to the oil and gas business, we are a world leader in the hydrogen fuel market. Shell companies have 832 megawatts of wind capacity worldwide and are committed to

be leader in the commercialization of second-generation cellulosic ethanol. Shell is helping to lead developments in carbon capture and storage through a variety of research and demonstration projects in North America and around the world.

Shell's environmental products trading business manages Shell's own compliance and services customer requirements in over 10 environmental markets around the world. The markets in which Shell trades include: the EU greenhouse gas Emissions Trading Scheme (ETS); the Kyoto Protocol's Clean Development Mechanism; the UK Emissions Trading Scheme; the Dutch NOx ETS; the Swedish Elcerts System; the US EPA Acid Rain Program (Title IV of the 1990 Clean Air) SO2 Emission Allowance market; the US EPA expansion of the Eastern States Ozone Transport Commission NOx trading program under State Implementation Plans (SIPs); the Houston/Galveston Area (HGA) NOx Emission Allowance Program; the California South Coast Air Quality Management District (SCAQMD) Regional Clean Air Incentives Market (RECLAIM) for NOx; the Alberta Specified Gas Emitters Regulation greenhouse gas program; the Regional Greenhouse Gas Initiative; and many of the renewable energy and Renewable Energy Certificate (REC) markets created by state Renewable Portfolio Standards.

Shell was the first company to transact EU allowances under the EU ETS, and the first company to trade a futures contract on a US federal compliance instrument on the Chicago Climate Futures Exchange. We are also currently preparing to participate in the forthcoming Australian Carbon Pollution Reduction Scheme and the New Zealand ETS.

Shell is also a member of the U.S. Climate Action Partnership, a coalition of corporations and environmental NGOs formed three years ago to work with Congress and the President to enact a climate policy centered around a cap and trade program. We believe such a policy must be environmentally effective at the lowest possible cost to the economy. It must be fair, market-based and encourage the development of key technologies.

Shell is proud to be a member of USCAP. We worked hard alongside its 30 other members to craft the Blueprint for Legislative Action. We are proud of the result.

USCAP was pleased to testify before the full Energy and Commerce Committee the day we rolled out our Blueprint for Legislative Action. The organization has worked tirelessly in the six weeks since the roll out to meet with Members of Congress, leadership, committees and staff on both sides of the Hill and familiarize you with the Blueprint.

I am particularly pleased to have this opportunity today on behalf of Shell to discuss USCAP's specific recommendations regarding offsets.

The Role of Offsets in Reducing Cost Compliance

Given today's economic challenges, it is critical that we ensure a smooth transition to a low-carbon economy at the lowest possible cost. Shell and USCAP support a cap and

trade program that covers large sources, transportation and natural gas used by consumers. This represents about 80% of emissions. The use of offsets from non-covered domestic and international sources is critical to making that transition at lowest cost.

A cap and trade program moves to reduce emissions by limiting the number of available allowances year after year. We believe that a range of approaches for managing supply and demand within a cap and trade system is essential to contain price volatility and ensure a deep and liquid market. Access to a quality offset market, along with banking and limited short-term borrowing of allowances, is an integral part of a cap-and-trade system.

Quality offsets from reforestation, recovery of landfill gas, advanced farming techniques and other areas are available both domestically and internationally at reasonable prices. The use of them will allow aggressive environmental targets to be met at a more reasonable cost while allowing time for the complementary measures proposed by USCAP to drive the development and implementation of the new technologies the world will need.

The key concern should not be the use of offsets, but, rather, ensuring that the offsets are quality offsets. They must be measurable, verifiable, permanent and enforceable. Such quality offsets help drive any climate program to its environmental goals. Since the total accumulation of GHGs determines the climate impact, reducing a ton of emissions from one source has the same climate impact as reducing a ton of emissions from any other source. The interchangeability of emission reductions in a cap-and-trade system helps manage costs since the cheapest reductions are likely to be made first.

Carbon Reductions in Developing Countries

Quality offsets are an excellent tool for CO2 reductions in developing countries. We know it could be many years (if ever) before cap-and-trade covers all of the economy in all parts of the world, yet we still need to introduce emissions reduction into those sectors and countries not immediately covered. Quality offsets are a way to do this.

It s also important to focus on the type of offsets we want. To do this it is necessary to think about a tool used in emissions management called an "abatement curve". This is a graph that plots the cost of emissions reduction on one axis versus the potential quantity of reduction at a particular cost on the other axis. An abatement curve will cover all options from home insulation (on the very low-cost end of the curve) right through to carbon capture and storage (at the high-cost end of the curve). The point of the cap-and-trade system is to deliver a carbon price that activates the projects along the curve.
The point of the offset market is to broaden the volume and range of projects available at some point on the curve, both to offer compliance flexibility within the cap but also to introduce the notion of a carbon cost to those outside the cap, both domestically and internationally.

Certain offsets can actually be the start of a decarbonization trend in countries not immediately covered by a cap of their own. This allows such countries the opportunity to begin to manage emissions in their own economy, eventually bringing them forward the point at which they too can adopt targets.

In addition to reducing CO2 in the atmosphere, quality offsets can bring a range of other environmental benefits including improving habitat, water quality and biodiversity at the site where the offsets are created.

Offset Credits and Shell's Compliance Strategy

Shell's compliance strategy on a U.S. cap and trade program will likely consist of the following:

- A program within our facilities to determine the range of abatement opportunities available and their cost.
- Our trading business will work with project developers to establish a flow of offsets into the market.
- A development program that will allow Shell to implement technologies such as carbon capture and storage as the technology matures and the market dictates its need.

These three components are necessary to manage emissions, manage cost, provide opportunity and ensure compliance, not just today but over the years to come. Removing any one of them limits the flexibility that a large entity such as Shell has at its disposal and ultimately drives up our long-term cost of compliance.

Targets/Timetables and Scope of the Offset Program

To the issue of targets/timetables and the availability of offsets, USCAP noted in its Blueprint for Legislative Action that economic modeling and experience in other markets suggest that the more rapid the decrease in allowed emissions the higher the cost of compliance.

A simple example of the role offsets can play in reducing costs is as follows: Let's say the marginal reduction cost without offsets in an aggressive schedule could require a company to replace its diesel engines with natural gas driven engines at a cost of $50/ton, potentially impacting the cost of its products. If 20% of the reduction target is met using offsets, however, that company might reach the other 80 % of the target by upgrading the diesel engine to improve its efficiency at a cost of $20/ton.

The use of offsets can allow a company to phase-in capital stock turn-over in a more cost efficient way. For example, companies could use offsets to achieve environmental goals until costly new technologies mature and become more affordable.

USCAP recommends generous limits on the use of offsets to help moderate the compliance costs as the economy drives to the more stringent emission targets many, including Shell and USCAP, now believe are necessary to address climate change.

The scope of the offset program must be broad in order to reach as many sources of emissions not captured by a cap and trade program as possible.

An offset program with the appropriate scope can also encourage commercialization and international deployment of advanced technologies necessary to achieving needed GHG reductions in future years. There is considerable discussion in the international community right now regarding whether carbon capture and storage should be a recognized offset.

It is Shell's view that a ton of CO2 permanently stored at a CCS site is the equivalent of a ton of CO2 avoided and should get a full offset credit in any national and international scheme. Including technologies like CCS in an offset program incentivizes this vital technology. Including CCS in an international offset program helps encourage the deployment of CCS in developing countries like China, where the commercial deployment of this technology when it has matured can make a dramatic difference in this country's emissions.

USCAP Proposal

USCAP recommends that Congress set an upper limit on the use of offsets for compliance in any year at 1.5 billion tons of domestic and 1.5 billion tons of international offsets. Congress should specify that the initial annual limit on offsets be 2 billion tons.

USCAP's offset recommendations are integral to our support for the aggressive environmental targets referenced in the Blueprint. USCAP and Shell believe the targets are achievable at manageable costs to the economy provided that the offsets and other cost containment measures we recommend at enacted.

Congress should establish a Carbon Market Board and give it authority to set annual limits on the level of domestic and international offsets within the 2-3 billion ton range. The CMB should have the authority to increase the annual limit to avoid undue economic harm from excessively high allowance prices and/or increases in the price of natural gas due to fuel switching, and encourage technology transformation, including the development of carbon capture and storage.

In exercising this authority, CMB should take into account the number of banked offsets in the private sector, the degree to which the criteria for offset quality described have been effectively implemented by EPA, and the size of the strategic reserve pool.

The annual limits on offsets should be implemented in a manner that ensures easy and efficient access to offsets by all covered firms while providing flexibility and limiting the potential for speculation.

Even with ample offsets, there will still be the potential for extreme volatility and spikes in allowances prices. To limit such price spikes and volatility, especially in the early years of the program, USCAP recommends the establishment of a strategic reserve pool that includes: a) program-based and other governmentally certified offsets, including but not limited to forest carbon tons derived from offsets due to avoided tropical deforestation; and b) allowances borrowed from future compliance periods.

Offsets and/or allowances in the strategic reserve pool would be released into the market when allowance prices reach a specific threshold price. The reserve pool auction threshold price should be set at a level that prevents undue economic harm from excessively high allowance prices and/or increases in the price of natural gas due to fuel switching, and encourages technology transformation, including the development of carbon capture and storage.

Offsets released into the market from the reserve pool may be used without limitation and shall be in addition to the offset limit use recommended above. In order to achieve these objectives, the strategic reserve pool will need to contain a very large number of offsets and the CMB would need to have the authority to release them into the market on an as-needed basis. Thus, it is crucial that the reserve pool be very large and that the U.S. Government be empowered to fill it and replenish it as needed. We further recommend

- ✓ Congress should direct EPA to establish a program to certify forest carbon tons, using the criteria described above. These certified forest carbon tons may be held or traded by private entities at any time, and may be used for compliance purposes, without limitation, whenever the CMB-established threshold price for offset release from the strategic reserve has been reached.

- ✓ The allowance component of the reserve pool would utilize a limited number of allowances borrowed from future compliance periods but the CMB would only be authorized to use this mechanism as a measure of last resort if the reserve pool temporarily does not contain sufficient offsets to meet the cost containment need.

- ✓ Congress should charge the CMB with the responsibility to establish and update the reserve pool auction threshold price, determine the number of offsets to include in the reserve pool, and determine how many offsets and allowances need to be sold at or above the threshold price.

- ✓ To limit speculative purchases from the reserve pool and allow an increasingly strong price signal, the CMB should increase the threshold price at a rate that moderately exceeds the time value of money. .

- ✓ Finally, the system used to release offsets and allowance reserves into the market should be transparent and predictable, and designed in a manner that minimizes interference with normal market processes and prevents manipulation of the allowance price.

Quality of Offsets

Let me say at the outset, Shell recognizes the problems with the Clean Development Mechanism. We support reforming the current system. Shell strongly advocates rigorous standards for any national or international offset. We believe offsets must be of the highest quality. We advocate the use of third-party verification to assure the validity and quality of any offset.

One of Shell's leaders sits on the board of the Climate Action Reserve. We have worked closely with this organization in crafting its protocols for certifying offsets. We fully support CAR's protocols as an outstanding example of what a quality offset protocol looks like.

Additionally, the USCAP Blueprint provides rigorous guidelines for ensuring the quality of offsets. We believe criteria must be established to ensure all offsets are environmentally additional, verifiable, permanent, measurable, and enforceable.

USCAP recommends that EPA be directed to establish through a transparent process an offset program using a standards-based approach within 18 months of the enactment of climate legislation.

Under a standards-based approach, an EPA rule should identify specific categories of offsets that are eligible to qualify, along with clear procedures to achieve certification, and clear guidance to offset providers about how they can meet the standards.

The eligible categories of offsets should be added to or modified over time based on experience, and standards should be periodically updated to ensure environmental additionality.

In the case of international offsets, in addition to meeting the criteria described above, USCAP asks that EPA should be directed to establish a transparent process for evaluating and approving international offsets. EPA should enable international offsets that meet the quality criteria be approved during the early years of the program, with a schedule to assure that over time international offsets result in incremental reductions beyond a nationally appropriate country or sector-specific emission reduction commitment that covers a suitable share of a countries' emissions, consistent with the global goal of avoiding dangerous climate change.

Additionally, Shell would like to see the United States assertively involved in international climate negotiations. A strong presence in the international community

creates an opportunity for the United States to make the EPA standards the international standards for everyone, ensuring one international mechanism and addressing concerns with the current CDM. A single tradable international offset mechanism is an important precursor to a global carbon market, which will then deliver a lowest cost pathway to the needed global emission reductions. Thank you.

Mr. MARKEY. Great. Thank you, Mr. Martin, very much.

Our next witness is Ambassador Stuart Eizenstat. He is a partner at the law firm of Covington & Burling and focuses on international trade and dispute resolution.

He was the lead U.S. climate negotiator during the Clinton administration and has served in several roles in the Federal Government, including Ambassador to the European Union and Deputy Secretary of the Treasury. He is here today on behalf of the Forest Carbon Dialogue.

We welcome you, Ambassador Eizenstat.

STATEMENT OF STUART EIZENSTAT

Mr. EIZENSTAT. Thank you, Mr. Chairman, Mr. Upton. I am here today on behalf of the Forest Carbon Dialogue, which is a unique environmental corporate coalition dedicated to provide domestic and international forest carbon provisions in any U.S. climate legislation.

We cannot solve climate change without forests. Deforestation contributes some——

Mr. MARKEY. Mr. Ambassador, could you move the microphone in just a little bit closer?

Mr. EIZENSTAT. Deforestation contributes some 20 percent of all greenhouse emissions, more than all the transportation modes in the world: more than cars, trucks, trains, and planes together. Deforestation accounts for the fact that Brazil and Indonesia are the fourth- and fifth-largest carbon dioxide emitters. Forests also have the potential to address cost-effectively up to half of all human-caused emissions.

The use of forest credits in climate change legislation would accomplish two goals at the same time. First, they would provide American-regulated corporations and entities a cost-effective way to meet emission targets. The greatest threat to passage of cap-and-trade legislation, as shown by the Senate debate last year, is concern about cost, particularly now in a time of economic weakness. Offsets addresses that.

The second benefit, one I saw clearly at Kyoto, is it can tangibly encourage developing countries to take actions to deal with climate change and break the China-led phalanx of united opposition to action on climate change by getting the developing world engaged in this process and creating, at the same time, a more level playing field for U.S. industry.

There are also multiple co-benefits to a robust forest provision in legislation. Biodiversity and environmental protection is one. Tropical forests are home to half of the world's species, who will be protected. They help restore degraded lands and watersheds. They reduce soil erosion and provide clean water and avert draughts and crop failures.

Second, they contribute to sustainable development. Eighty percent of the world's rural poor in developing countries depend for their livelihood on forests. Cutting them down at the rate we are doing, which is one football field per second, means that the rural poor will be deprived of a place to live.

And that is why the third benefit is a security benefit. U.S. military experts, in a recent report, indicated that fragile societies will

become even more unstable, and a new mass movement of "eco-migrants" will occur, bringing vast human and economic cost to our doorstep. Forests can help avoid that.

There have been path-breaking economic analyses recently by Sir Nicholas Stern and by the Eliasch report for the U.K. Government, by McKinsey, and by the Lawrence Berkeley Laboratory, all setting forth in detail the critical role forests and land use can play in cost-effective ways to deal with climate change.

They also document that the incentives to cut forests are so great, they are so tremendous—cut them, plant soybeans, and export them—that you have to create robust incentives to avoid that incentive to cut. Once they are gone, they are gone forever. This is not like Weyerhaeuser replacing its forests on a regular basis with seedlings.

The costs are anywhere from $5 billion to 10 billion, according to the Stern report, to the 2008 Eliasch report, which says $20 billion to $30 billion. You cannot create those kinds of incentives by foreign assistance alone. You need market mechanisms to mobilize the power and discipline of markets to offset the tremendous pressures to cut.

Now, there is a new world out there. Developing countries who were not, at Kyoto, willing to play are willing to do so. For example, the Common Market for Eastern and Southern Africa, COMESA, with some 17 countries, the Coalition for Rain Forest Nations—all are saying their contribution to dealing with climate change will be to avoid deforestation if they are provided incentives to doing so. And they must have, because the incentives to cut are absolutely so enormous. This is not a way of avoiding action. And, indeed, it will encourage more aggressive action.

Brazil announced just a few months ago, Mr. Chairman and members of the committee, its first-ever target to cut the massive rate of deforestation of the Amazon by 70 percent over the next decade. The reason why, if you look at the top five countries in emissions, Indonesia and Brazil are in the top five isn't because of their industrialization, it is not because of their cars, it is because they are cutting their forests down.

Just this week, this very week, Indonesia applied for a World Bank program supporting developing-nation efforts to fight deforestation and earn money through the sale of tradable forest credits.

Now, I would like to deal very quickly with the questions that have just been asked. They are obvious questions. President Reagan said, when he was dealing with the Soviets on arms control, "Trust but verify." There is verification here, and let me go into it very quickly.

Credits generated from national and subnational reductions in deforestation can be, and are being as we speak, verified on the basis of objective, transparent, open-access remote sensing data. What that means is satellite telemetry has improved so substantially, Google can look into neighborhoods and into forests. A partnership announced this very week between Cisco and NASA and Brazil's INEP are making available free on the Internet a national baseline that can be created for forests with on-the-ground monitoring and scientific evaluation to provide certainty about the level and change of the forest carbon content in our forests.

The Eliasch report, just a few months ago, for the U.K. stated that monitoring emissions from forests based on satellite telemetry is more reliable than monitoring emissions from any other sector.

In addition, national forest baselines and national accounting frameworks can be developed that are critical to make these forests' carbon markets integral. Any reductions below that national baseline are real reductions, not false reductions.

There are also a variety of insurance mechanisms, Mr. Chairman and members of the committee, that can be put in place, buffer funds and buffer zones in which a percentage of carbon credits and/or forests themselves can be held in reserve in case there is any change in policy or forest fires.

In addition, actual insurance products are being developed now by the insurance industry and the World Bank. Liability clauses can provide additional insurance. And leakage can be dealt with through the market price of the credit, discounted if the credit is less valuable. Offset credits would be available only if an entire country's rate of emissions from a protected sector falls below a particular established baseline.

Mr. MARKEY. If you could summarize, Mr. Eizenstat.

Mr. EIZENSTAT. Therefore, there are ways to deal with these questions, but there is no time for delay. If we dilly-dally on this, these forests will be gone by the time we implement this, and we will not be able to deal with 20 percent of the problem that is existing now in CO_2 incentives. It is urgent to act now. We can solve this problem. This is a cost-effective way, both for U.S. companies and to incentivize developing countries that haven't been willing to play before.

[The prepared statement of Mr. Eizenstat follows:]

Testimony of Stuart E. Eizenstat
Covington & Burling LLP
"Forest Credits in U.S. Climate Legislation: A High-return Investment in U.S. Environmental Goals and Security"
Before the House Committee on Energy and Commerce
Thursday, March 5, 2009, 9:30 am
Rayburn 2322

Good morning, Mr. Chairman and members of the Committee. Thank you very much for holding this hearing and for taking such a strong interest in the critical role that sustainable forest management can play in delivering results on climate change. I am here today on behalf of the Forest Carbon Dialogue members to detail for you our perspective on these issues and to share our thoughts on the way forward. The FCD is a unique environmental-corporate coalition that includes SFM, Environmental Defense Fund, American Electric Power, Shell, The Nature Conservancy, Wildlife Conservation Society, PG&E, The Woods Hole Research Center, John Deere, Conservation International, Duke Energy, and Defenders of Wildlife. We are consulting with other stakeholders, members of Congress and the Administration to urge that robust domestic and international forest carbon provisions be included in U.S. climate legislation.

I was the lead U.S. climate change negotiator during President Clinton's administration, and I am a vocal proponent for U.S. leadership to include forests in U.S. domestic climate change legislation. The forest sector is key to climate change. We cannot solve climate change without forests. Deforestation now contributes some twenty percent of all greenhouse gas emissions, more than all the transportation modes in the world--cars, trucks, trains, airplanes. It is deforestation that accounts for the fact that Brazil and Indonesia are the fourth and fifth largest CO2 emitters. Forests also have the potential to address cost-effectively up to half of all human carbon emissions (IPCC Fourth Report, 2007). Let me be even more emphatic. Today, in the midst of a global economic crisis, we have the opportunity by appropriate use of forest credits in climate change legislation to accomplish two goals in one. First, we can provide a way for American regulated entities to find cost-effective approaches to meet these emission targets. One need only to look at the debate last year in the Senate on the Boxer-Lieberman-Waxman bill to recognize that the greatest threat to passage of the kind of ambitious cap-and-trade legislation President Obama, Chairman Waxman, and Chairman Markey champion is concern about cost, even more so now at a time of economic weakness. And there is a second benefit. We have the imperative and the opportunity to tangibly reward developing countries for taking action that not only will enable us to act faster and more vigorously on climate change, but will make the world a far safer and more hospitable place for us all. Avoided deforestation can be the contribution that many in the developing world make to addressing climate change. This, in turn, can allow many developing countries to break from the phalanx of united opposition to action on climate change I confronted at Kyoto. Though we face technical requirements and challenges, they are already being met with resolve and creativity.

Current efforts have absorbed, reflected and addressed the serious mistakes of the flawed model of the Clean Development Mechanism, or CDM, which has done almost nothing to incentivize forest-related efforts. U.S. domestic legislation can provide strong incentives for the success of far more market-oriented and tested approaches. In this case, the stakes are simply too high, and the downside of inaction far too great, to let the perfect be the enemy of the good.

Forests, Climate Change and Global Security: If Congress includes robust forest provisions in U.S. climate change legislation, you will be leading the way towards a global partnership to fight climate change cost-effectively and cooperatively. In addition, you will help to generate multiple co-benefits, to biodiversity, to global security and to sustainable development around the world. This will be an historic contribution to preserving global biodiversity and the fragile ecosystems and watersheds upon which people, especially some eighty percent of the rural poor, depend for their livelihoods and well-being. You will help to avert specific devastating climate change impacts -- including deadly crop failures and drought conditions -- likely to leave half of the world's population to face acute food shortages by 2100. Please bear in mind as well that two-thirds of the world's population live near vulnerable coastlines. Senior U.S. military experts have stressed that as resources collapse and vulnerable areas are affected, fragile societies will become far more unstable and, along with mass movement of "eco-migrants," will bring instability -- and its economic and human costs -- to our doorstep.

Contrast that apocalyptic vision with a very different and yet feasible path on which the world's forests would be managed so as to counterbalance as much as forty or fifty percent of the world's human carbon emissions, and to provide development resources, environmental services and livelihoods for a wide swath of humanity. The Fourth report of the Nobel-winning Intergovermental Panel on Climate Change (IPCC) makes clear that action to promote sustainable forestry is critical and that forests have this enormous natural potential as a carbon sink. The contrast is real, the stakes are incredibly high, and choices must be made now.

An Economic Green Revolution, Sustainable Development and Low-Carbon Growth: Path breaking economic analyses by Sir Nicholas Stern for the UK government; by the McKinsey Global Institute, in the Eliasch report; and by U.S. research institutes such as EPA-funded Lawrence Berkeley Laboratory, sets forth in detail the critical role forests and land use can play in fighting climate change cost-effectively while generating enormous resources and flexibility for needed change. The McKinsey study stresses that to achieve needed emissions reductions will require hundreds of billions of dollars in new global investments for decades, and involve economic change equivalent to another industrial revolution, but ten times faster than the original. The Stern report suggests $5 to $10 billion annually will be necessary to provide incentives against cutting down tropical and sub-tropical forests. The recent Eliasch report estimates that just to cut in half current deforestation through 2030 will take $20 to $30 billion per year. Change and investment on this scale cannot be accomplished with small, aid-based efforts. They require the power and discipline of markets.

Meanwhile, the UN Food and Agriculture Organization, the International Food Policy Research Institute, World Bank and other development experts urge us to recognize that billions of people worldwide currently rely upon forests for income and basic needs. Forests provide cocoa, coffee, fruits, nuts, medicinal plants, fuel for heating and cooking, as well as habitat for insects,

birds and animals which pollinate crops and provide food to local people. Forests also generate billions of dollars in raw materials for timber, paper, building supplies and furniture as well as pharmaceuticals. Forests help to regulate water quality, prevent soil erosion and currently are home to perhaps 90 percent of the world's terrestrial biodiversity though they now cover just six percent of our planet.

It is extremely important to recognize that many developing countries, including some of the poorest in Africa and elsewhere, want to take action today on climate change and sustainable development. This was not the case at Kyoto. African countries in the Common Market for Eastern and Southern Africa (COMESA) want to protect their forests and have incentives for good land use and agricultural practices. The Coalition for Rainforest Nations wants incentives to avoid the pressures of deforestation, and pressed this issue vigorously at the 2007 negotiations in Bali. And, those pressures are enormous.

There are strong commercial incentives to cut down trees--which will never come back--to make way for the production of agricultural products for exports--like soybeans. Rewarding sustainable forest and land use management realistically offers developing countries the only way to fight these pressures. Inefficient energy and agriculture, poor land tenure and enforcement, and a lack of clear and widely-recognized economic incentives to value forests are major drivers of deforestation and poor forest management. By including robust credits for international action on forests in U.S. domestic climate change legislation, we can generate concrete incentives for developing countries to improve land tenure, and to provide access to extension and financial services, education and training, and rural infrastructure, among other things.

If the United States will lead by bringing sustainable forestry and land use together with strong domestic climate action, the potential direct human impact alone is enormous. Millions of women may not have to walk miles alone and vulnerable to find and haul water and firewood, but instead find food, hospitable environments and income-producing work closer to their homes and families. Pro-active U.S. steps to credit and support action on tropical and sub-tropical forests will also bolster myriad efforts underway to ensure that the emissions reduction results of forest efforts are real, that the rural poor and indigenous people benefit both directly and indirectly, and that those efforts drive a faster transition to low carbon growth.

Incentivizing and supporting investment in forests that recognizes their value in place, far exceeds most alternatives and makes sense environmentally, politically and economically. It also generates shared development resources for innovation, green jobs and more productive and sustainable agriculture and land use. Action on forests can be a major source of incentives and funding for investments in another green revolution in agriculture, for example, in Africa where poverty, drought, desertification, disinvestment, conflict and capacity have kept many of the rural poor in impoverished conditions. If forests become more valued for the full range of their services, and signals are clear that sustainable land use will follow in time, agriculture and food production will be driven towards greater productivity.

Why We Cannot Wait to Act Boldly: In the developing world, near-term growth now competes with sustainable development, as it apparently does even here. That need not be the

case. We must change the incentives and structures that keep us all bound into that straitjacket. As we address the technical and measurement issues and governance concerns -- and those challenges are being addressed vigorously and effectively -- we simply must bear in mind that climate change mitigation and adaptation cannot and will not be achieved without action by developing countries, and specifically not without action on forests, their biggest source of emissions. It will take time to build up and integrate capacities and information, and to ensure against risks of reversal, leakage and impermanence. But we simply cannot and should not let the perfect be the enemy of the good.

Action on forests (and ultimately on land use) is not a way out of getting results or taking domestic action. It is a means to do so aggressively, while also taking aggressive action on fossil fuel and other emission sources. If we want climate change legislation to work, we need to treat forest-related efforts as serious and very important. There must be room and support in these early years to experiment, innovate and learn as countries -- and communities, companies and organizations -- further develop and improve the infrastructure to achieve the goal of full and credible national accounting for real emission reductions. But it must be done on a scale and at pace sufficient to drive a revolution, and that requires strong signals and incentives. And, to energize countries and companies to act, early action credits should be provided.

Including Forests Will Speed Up and Enable Action in the United States and Worldwide: A commitment to practical efforts by the poorest developing countries, supported by the United States and the international community, can and should enable both the developed countries, and the major emerging economy emitters such as China, Brazil, India to move forward on a post-2012 global deal with more aggressive commitments than would otherwise be possible. In fact, this is happening already. In December 2008 in Poznan at the UN climate change negotiations, Brazil announced its first-ever target to cut the massive rate of deforestation of the Amazon by seventy percent over the next decade. Clearly, they would not have taken this bold and welcome step if they did not believe it would be rewarded, both in terms of their own environment but also under the post-2012 framework for carbon markets.

In addition to Brazil, the African regional organization COMESA launched its African Bio-Carbon initiative in Poznan. COMESA's nineteen members seek to take on voluntary commitments related to forests and land use (and they are eager to ensure that their efforts be assessed and credited). And the Rainforest Nations -- tropical forested nations from regions around the world -- continue the successful push they made in Bali in 2007 to put forestry on the post-2012 climate change agenda.

Recent Developments on Forests, Land Use and Climate Policy Internationally: One of the breakthroughs at climate negotiations in Poland in December 2008 was that key policy issues, including funding sources, for Reducing Emissions from Deforestation and Degradation (REDD for short) will formally be examined in-depth this year. Up until Poznan, the REDD discussions were held under a technical committee under the UN Framework Convention on Climate Change. Member States pushed to raise the policy profile of these issues and accelerate in-depth work on forest and land use issues, including how REDD credits will be part of post-2012 emissions budgets for countries with mandatory caps. During 2009, a two-track parallel approach will continue to look at the scientific and technical issues, as well as

policy issues related to the post-2012 framework. One of the major decisions of the COP in Poland was the give an increased role to "the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries." This language solidifies agreement reached in Bali and clearly allows for the inclusion of conservation, sustainable management of forests and enhancement of forest carbon stocks in any possible future REDD mechanism.

Making Action on Forests Practical and Effective:
I recognize that there are real questions about how action on forests, and ultimately on land use, can be undertaken within a framework that leads to credible emissions reductions. We must address national baselines and ongoing measurements needed to ensure credibility. We also have to describe how to transition to national baselines, and how projects and sub-national activities can contribute to such a transition. Permanence of the emission reductions and leakages also are of understandable concern to many. And finally, I know that there is genuine concern about the risk that development benefits will not be shared with the rural poor and indigenous people who depend on forests for their livelihoods. I will address all of these. Let me assure you that the Forest Carbon Dialogue is committed to only support forest-based credits that have integrity and that make real reductions in greenhouse gas emissions.

Let me first be very clear: these issues are real but manageable. Many practical pilot efforts are underway. Major international organizations such as the World Bank and IFC are working intensively to refine templates and methodologies, to help African and other governments get market-ready, and to ensure that carbon markets will function. As we speak, universities, development organizations (for example, UNEP, FAO and the World Bank), research groups -- such as the Consultative Group on International Agricultural Research (CGIAR), the World Agroforestry Center (ICRAF) and the agriculture and natural resources policy network FANRPAN are working with major donors (including the Gates and Rockefeller foundations and major bilateral contributors and environmental groups) to help developing countries learn to implement the right policies, monitor and assess protocols and to develop accountability frameworks to get the job done well. Unlike CDM projects, current efforts aim at inclusion, verifiability and crediting in a system where activities are expected to contribute to global emissions reductions. The incentives, players and approaches are diverse, motivated and much evolved from the poor example of the CDM. They offer strong insights into the concerns you have raised.

For many developing countries, forests and land use account not only for the vast majority of their emissions, but also embody their opportunity to help to address global climate change while continuing to grow and improve lives at home. Forest credits offer hope where the global crisis has made it more scarce than ever.

Baselines, measurement and sub-national efforts: We believe that is essential for countries seeking forest credits to move towards a full national accounting framework of sources and sinks in their forest sector. Developing countries are aware of the issue of national baselines, and have urged the UN and others to help them accelerate this process, and to disseminate and build capacity based on the good work that has been done already. In projects well underway, for example, satellite telemetry is ground-truthed and field tested intensively, and the analytical

results evaluated, shared and compiled into databases that researchers increasingly can access worldwide. The IPCC Best Practices methodologies have been translated into numerous concrete practice manuals and templates used in projects worldwide, and subsequently improved and shared as a result of this field testing. International organizations and research groups are working to ensure that these experiences converge in global best practices.

In addition, serious attention is being given to insurance products and services, and other mechanisms to address issues of permanence and leakage and the risks of policy changes by specific governments once activities are underway, for example, by the International Finance Corporation at the World Bank. The IFC is experienced with insuring risks and activities in developing countries. The UN pays close attention to these efforts and at each meeting of the UNFCCC bodies to prepare for Copenhagen, both the technical and the policy issues are discussed with a view to including forests in the post-Kyoto framework in a workable, effective manner.

For some forest nations, developing national baselines will require both time, capacity building and resources. Yet there is great urgency to begin immediately to reduce deforestation and significant value in lowering the cost of real reductions under cap and trade systems. In that light, we recommend that for a limited period forest sector activities related to emission reductions in countries that have not yet established national accounting frameworks be eligible for credits. For countries which do not progress towards national accounting as required, these credits should be discounted after a period of time, and simply eliminated if progress remains stalled. The key is to support and incentivize best practices, high quality standards and a workable, effective system which makes clear that we want developing countries, including the poorest, to contribute as they are able to climate change mitigation and adaptation. If it also spurs sustainable development more deeply, that is all to the good. Moreover, including as many countries as possible in a workable but rigorous framework actually reduces the likelihood of international leakage.

Let us also be clear that sub-national activities provide a much-needed incentive to build capacity in countries so that they can move to national accounting approaches. Sub-national activities also enable us to refine global best practices. I should note too that sub-national does not refer only to projects. It can, and should, include state or province level activities with jurisdiction-wide accounting that are comparable to national-level approaches. As some of you may know, our own States of California, Illinois and Wisconsin are already working actively to promote effective sub-national activities in developing countries.

In November 2008, the Governors of California, Illinois, and Wisconsin signed a series of Memoranda of Understanding (MOUs) with four Brazilian states and two Indonesian provinces that expressly recognize the importance of REDD and international forest carbon. This MOU calls for cooperation in the development of "rules to ensure that forest-sector emissions reductions and sequestrations, from activities undertaken at the sub-national level, will be real, measurable, verifiable and permanent, and capable of being recognized in compliance mechanisms." As a result, the Brazilian state of Matto Grosso, several times the size of Costa Rica, is interested in moving ahead on REDD through the California MOU process. We absolutely should not discourage that.

This effort by U.S. States represents the first effort to move into what might be called the "proof of concept" stage in the ongoing effort to bring REDD and international forest carbon activities into existing and emerging compliance regimes. As such, the effort carries global significance as a signal to other governmental entities and to the broader climate policy community that this is achievable and that there is and will be a meaningful process of transnational cooperation among the MOU states. This cooperation will develop workable frameworks and mechanisms to generate compliance-grade assets from REDD and other forest carbon activities in Brazil and Indonesia and to bring such assets into existing and emerging compliance regimes in the United States (and elsewhere).

Precluding sub-national activities from eligibility for credits would undermine or destroy these efforts and undermine rather than advance participation by major emitters like Brazil and Indonesia, as well as support and progress towards national level efforts. No one seems to suggest that U.S. sub-national efforts to reduce green house gas emissions are just a distraction or that they undermine the effort to move toward national level reductions with a federal cap-and-trade bill. It is imperative that Congress recognize that climate policy which seeks to address forest-related emissions must support important sub-national work along with that undertaken by national governments.

Addressing Reversals: As with other emission reductions, the objective of including forest-related activities is to reduce carbon emissions from those activities over time. The most powerful way to ensure that emissions related to forests are reduced -- and those gains valued in ways that incentivize against reversals -- is to signal clear support for an international policy architecture which rewards the reductions, commits relevant parties to maintain the reductions overall, and regulates activities such that intentional reversals are unlikely and unintentional ones are addressed.

A number of concrete proposals and mechanisms can reinforce the role of national baselines and measurements in this regard. They include requiring countries to establish "reverse funds" with a portion of their forest credits or to retain a portion of their forest credits in reserve, without selling them, as a de facto insurance policy, as well as liability rules built into agreements, and the development of specialized insurance products. These and other approaches are already being developed and analyzed. I should highlight as well that many of the drivers of such "reversals" -- whether it be fires, land-clearing or illegal logging -- will occur far less where national and local governments and other stakeholders, set policy and act upon the powerful incentives created by a system of credits within a framework of binding cap and trade approaches, national accounting standards and robust compliance regimes.

Just yesterday, for example, Indonesia announced that it has applied to join a World Bank program that supports developing nations' efforts to fight deforestation and help them earn cash through the sale of tradable carbon credits. The Bank's Forest Carbon Partnership Facility supports countries to design and create high quality projects, and Indonesia already has several, to enable them to be ready to tap substantial resources from carbon markets by protecting their forests. Slash-and-burn farming and clearing for oil palm and other plantations have triggered vast fires in Indonesia, particularly on peat land, accelerating the amount of carbon dioxide in the

atmosphere, scientists say. Regarding forest carbon credits, Indonesia's submission explains that, "such an investment could result in alternative and sustainable livelihoods for many of Indonesia's 10 million lowest income families who currently survive on uncontrolled harvesting of forest and expansion of slash and burn agriculture." Clearly, Indonesia believes that the market will provide strong incentives to enable behaviors to change, and those changes would support real emissions reductions and act to reduce man-made activities that cause "reversals."

Minimizing Leakage: The first line of defense against leakage is to bring together as many countries as possible -- both by incentives and by commitments -- effectively into a system that rewards shared, ongoing, long-term action. That is the fundamental reason we need to give developing countries -- all of them -- a reason to support action on climate change. Our legislation and the post-2012 framework should also help us to enlist developing countries in holding accountable both the developed countries who take on specific, binding, economy-wide emission reduction commitments; the emerging economies who take sectoral and energy efficiency targets; and the poorest countries which choose to make voluntary commitments, for example, with respect to their forest sectors. Forest-related activities are actually less likely than many others to displace emissions-producing activities to another country or site, especially if they include robust sub-national arrangements, a clear transition to national accounting, and a large number of forested countries.

Establishing local control over forest resources, as has been done by the Government of Madagascar in the Makira Forest Project, can both reduce leakage and help to ensure that benefits are shared. Under this project, which is supported by the Wildlife Conservation Society, the national government transferred management responsibility for the forest to elected communal bodies (COBA). The government compensates communities through the COBA for access to and authority over the forests, and carries out the function of monitoring to ensure the project adds to emissions reductions. The COBA, meanwhile, act against illegal deforestation and to promote sustainable land use and livelihoods from the forests. This is but one example among many.

Compliance also matters and projects such as Makira(and there are many of them worldwide), help build the data and the capacity needed to ensure environmental effectiveness. But as President Reagan once said, it also important to verify as we trust. On Tuesday of this week, NASA and Cisco launched a joint partnership involving the Ames Research Center to develop a global platform to measure and analyze climate change, with a specific focus on forest carbon. Nancy Birdsall of the Center for Global Development called it, "an absolutely critical tool." It is one of many tools evolving to help weave together action on the ground with a much higher level of understanding of sources and changes in global emissions.

Promoting Shared Development Benefits: Poverty and a lack of capacity and other resources characterize the rural poor in many parts of the world. We understand concerns that even with up to $50 billion annually in new development resources generated by including forest credits in U.S. and international climate policy frameworks, the poorest may not be empowered to overcome all of these obstacles. As a practical matter, we may not be able to address this fully with climate change policy instruments. I have spent many years of my life working to promote accountable governance, shared growth and investments in people in developing countries.

Poor governance, a lack of inclusion and low capacity are among those things which actually drive deforestation and eco-system destruction. The World Bank recently issued a new climate change strategy which recognizes the need to incorporate policy considerations fully into country strategies, including the programs, policies and investments designed to address poverty and marginalization. Many developing countries recognize that without property rights and shared benefits among all those affected by action on forests, they will not achieve and secure the benefits of forest carbon credits. Many, such as the COMESA countries in Africa, see clearly the inter-related nature of agriculture, land use and forests, as well as the links to property rights, financial service access, and education and training. They are prepared to reshape policies and investments accordingly, and to address governance concerns.

Indonesia's application to the World Bank to join its Forest Carbon Partnership Facility illustrates the power of incentives, both their level and the direction in which they push. Between 1997 and 2000, Indonesia's deforestation rate was 2.8 million hectares per year, falling to 1.2 million hectares in 2000 to 2005. The main drivers are described as extensive forest harvesting by pulp, paper and palm oil firms, expansion into rainforests and peat land by agriculture and forest plantations as well as encroachment by low-income communities into forest lands. At the same time, the Indonesian government's submission recognizes that REDD could change those incentives and be a major, counterbalancing driver for investment. "REDD-related incomes could also support a substantial investment in peat land restoration and broadly-based, rural and village level forest enterprises," according to Indonesia's application. The submission also explores the cost competitiveness of REDD versus palm oil and timber plantations, and finds that at very realistic carbon credit prices, REDD would be competitive in Indonesia.

I would simply caution against trying to legislate detailed remedies through climate change policy. Climate change policy can establish strong incentives for inclusive, sustainable development and could also articulate aims and best practices for use of carbon credit resources in a manner which benefits rural poor and indigenous people. The most powerful thing climate policy can do is to give value to and improve the enabling environment for sustainable development. Without that, the poor -- including indigenous people who are poor -- will suffer dramatically and disproportionately.

What is Needed In U.S. Legislation: The Forest Carbon Dialogue sees four key goals as you consider language to ensure that domestic and international action on forests can be credited under U.S. legislation: (1) ensuring the overall environmental integrity of the program and maximizing its climate and biodiversity benefits; (2) delivering cost savings to a domestic cap-and-trade program that result from access to international forest carbon crediting; (3) creating mechanisms for developing nations to participate in global emissions reduction efforts; and (4) recognizing the urgency with which action must take place.

As a practical matter, we believe that markets will be most likely to provide the greatest opportunity to direct urgently-needed carbon finance to developing countries to protect their forests, but there are also essential roles for direct funding. They should not be seen as operating at cross-purposes. Both market-based incentives and development assistance funding are needed together to get results. The three critical elements contained in the legislative language that we

have proposed—market-readiness funding, credits for forest carbon activities, and direct support for other important forest carbon conservation activities—are integral parts of a complete package that will meet these goals.

Market-readiness: There is an urgent need for a dedicated funding stream to support efforts to build capacity in developing countries that will be essential for them to have in place before they are ready to participate in a national-level program. A dedicated stream of funding during the first several years of the program will be essential to develop monitoring networks, create working national institutions and programs that will form the foundational elements of national-level strategies to conserve forests, and reduce emissions from deforestation. We believe this funding duration could be limited to several years. We are working to develop more precise estimates of the need and will provide those to you as soon as they are available.

Credits for forest carbon activities: For many rainforest nations, emissions from deforestation are the vast majority of their national emissions and are a major source of global greenhouse gas emissions. We believe that it is essential for these nations to quickly move towards a full national-level accounting framework of sources and sinks in their forest sector that includes development of a measurable baseline against which to measure progress. Nations would only earn credits for reductions below an emissions baseline that would decline over time. Credits are only provided after nations have made progress, not before. Because of the scale of investment needed—estimated by some at tens of billions of dollars globally—public funding is likely to be insufficient to the task, and therefore carbon markets, enabled by supportive foreign assistance, are likely to be our best hope for achieving the bulk of the conservation needed. Moreover, curbing deforestation is a relatively low-cost emissions reduction opportunity, so including international forest crediting within a domestic climate program can significantly reduce the costs of a domestic program--one essential ingredient if we are to have meaningful legislation at a time of economic fragility.

For some developing forest nations, establishing a satisfactory national emissions accounting framework will require both time and considerable resources. Yet there is great urgency to immediately begin reducing deforestation, as well as significant value in lowering a cap-and-trade program's overall costs. We would recommend that for a limited period of time, activities in nations that have not yet established their national accounting frameworks be eligible for emissions crediting when they reduce emissions from the forest sector. Only activities that meet high quality standards established by the EPA would receive any crediting. While the end goal remains national-level strategies, sub-national projects may in some contexts allow the local drivers of deforestation to be more directly addressed and involve simpler institutional arrangements. Nevertheless, to provide incentives for nations to establish national-level accounting for the forest sector, credits for activities in nations with significant emissions that have not shown adequate progress toward a national emissions accounting framework should be discounted and ultimately eliminated if the country's progress remains stalled, as I have said.

Direct support for other important forest carbon conservation activities: A comprehensive international forest carbon conservation package must also address the needs of countries that currently have low rates of deforestation but may be "next on the chopping block." Pervasive activities such as illegal logging also pose widespread threats to global forest conservation. Our

proposal would dedicate additional allowance value from within a domestic emissions cap to address these and other threats, to support early action, and to support other low-cost opportunities.

The FCD believes that our proposed framework, taken as a package, represents an environmentally responsible and realistic framework, within the context of cap-and-trade legislation, for rapidly and dramatically reducing global emissions from the forest sector.

I look forward to working with you to answer questions, and stand ready to address any concerns you may have. I applaud your foresight in holding this hearing, and I urge you to consider the full range of issues I have raised here with you today. There is no time to waste. The UN believes that each second, an area the size of a football field is lost forever. There are issues that need work, but we must provide incentives against deforestation now or we will have lost an incalculable resource for all time while we try to develop a perfect system.

Thank you.

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Mr. MARKEY. Thank you, Ambassador Eizenstat, very much.

Our final witness is Dr. Michael Wara, who is the assistant professor at Stanford Law School. His research focuses on the emerging global carbon market.

We welcome you, sir. Whenever you are ready, please begin.

STATEMENT OF MICHAEL WARA

Mr. WARA. Mr. Chairman and members of the subcommittee, I am honored to appear before you and grateful to have the opportunity to talk about my perspective on the performance to date and the potential role of international offset programs in U.S. climate policy.

Mr. MARKEY. If you could speak up just a little bit.

Mr. WARA. Sure.

At the outset, I want to emphasize that, while my remarks and my written testimony are relatively critical of the clean development mechanisms performance to date, I remain a proponent of emissions trading in general, because emissions trading creates appropriate incentives to internalize the costs of climate change for firms and because it has at least the potential to substantially reduce the societal costs of addressing climate change.

We cannot afford to neglect the climate change problem any longer, but neither can we afford to ignore the present and future costs of addressing the problem.

I am not a proponent of the use of offsets for cost-control purposes within such emissions trading systems. However, given that offsets are likely to be used for cost control, there is much that can be learned from the experience to date in the international system to both increase the environmental credibility of international offsets within a U.S. system and to increase the administrative efficiency and transparency and perceived fairness of a U.S. program.

All offset systems face a tradeoff between the quality of the environmental auditing processes used to verify that real reductions occurred and the transaction costs and risks that offset project developers face. This tradeoff and tension and how it is resolved essentially determines the number of offsets that are brought to market and the potential ability of the system to create cost-control for the emissions trading regime at large.

Assessing whether or not a carbon offset represents a real reduction below what otherwise would have occurred or is essentially in "anyway credit" is an incredibly difficult regulatory problem and practice. And I would argue that the CDM has not had a very high level of success in resolving this thorny issue.

I think there are two major reasons for this. First is a poor administrative legal system that is not terribly transparent and provides cover for both changes in policy and for politicized decision-making. The second is the incredibly broad scope of the CDM. In particular, the fact that it includes offset project types where additionality assessment is intrinsically difficult to evaluate and where, as a consequence, project proponents can easily misrepresent financial, technological, and regulatory barriers to a project in order to create the impression that additionality exists when, in fact, it does not.

So what can the U.S. do? I think the U.S. can do a lot to address these issues in a future program. In particular, because, as EPA and EIA have demonstrated in their modeling results, in order to create effective cost-control, the U.S. is going to likely be compelled to purchase large numbers of international offsets and will become, likely, the largest buyer of international offsets globally. We have the opportunity to exert significant influence on the design of the international program and should do so.

And we should do it in three important ways. The first is to push for administrative legal reforms of the clean development mechanism or whatever follows it. In particular, we need to professionalize the offset regulator. Right now the regulators are part-time, volunteer political appointees. We need to remove conflicts of interest, which currently are faced by the third-party verifier, essentially the auditors and fact-checkers of the system. These conflicts of interest are pervasive and lead to flawed analyses. Third, we need to force regulators to justify their decision-making and to explain changes from past precedent, even if they aren't bound by that past precedent.

A second major area of reform that I would argue the U.S. should pursue is to limit U.S. purchase of offsets to those sectors where evaluation of project-level additionality is relatively straightforward. We should stay away, in particular, from sectors where evaluation of whether an emission reduction would have occurred otherwise is a very difficult question to determine.

Those sectors can be addressed but not at the project level. There is an important role for the U.S. to pursue in developing sectoral approaches to those sectors, especially the energy sector and also, I would argue, the forest sector. In the energy sector, it is because additionality is a difficult problem to assess. And in the forest sector, the concern is a leakage as much as additionality, the idea that Member Inslee pointed to, that how do we know that forests preserved here doesn't lead to forests cut down somewhere else. The appropriate answer there are national baselines.

Finally, the U.S. must make clear that offsets are a temporary solution to developing-country greenhouse gas emissions. We need to provide both positive and negative incentives for major developing countries to accept caps in the medium term. I argue that these incentives should include a time frame for phaseout of U.S. offset purchases and, as a carrot to induce a cap to be accepted, guarantees a full-market access to U.S. emissions trading markets for countries who do accept caps.

Mr. Chairman, that concludes my statement. I will be happy to answer questions at the appropriate time.

[The prepared statement of Mr. Wara follows:]

WRITTEN TESTIMONY
OF
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FACULTY FELLOW, PROGRAM ON ENERGY AND SUSTAINABLE DEVELOPMENT
FELLOW BY COURTESY, WOODS INSTITUTE FOR THE ENVIRONMENT

TO THE

SUBCOMMITTEE ON ENERGY AND ENVIRONMENT
UNITED STATES HOUSE OF REPRESENTATIVES
CONCERNING THE ROLE OF OFFSETS IN CLIMATE LEGISLATION

Introduction

Mr. Chairman and members of the subcommittee, I am honored to appear before you to testify on the performance and potential role of international carbon offsets in US climate policy. Overall, I believe that these markets hold limited promise, both as a cost control mechanism and as a method of engaging developing countries on the problem of climate change while also presenting substantial risks. The market I study most closely, the Clean Development Mechanism (CDM) of the Kyoto Protocol, has grown into the worlds largest carbon offset market, with hundreds of millions of credits worth tens of billions of dollars changing hands annually. Carbon offsets are in essence, a payment in exchange for a commitment to alter behavior in ways that lead to reduced emissions of greenhouse gasses (GHGs). Buyers of these credits, both governments and private firms, can then utilize them for compliance purposes in lieu of reducing their own emissions.

In this testimony I will address the lessons learned from the CDM experience so far, what the US could do to improve the situation if it adopts an emissions trading system that includes international offsets, what incentives such a system will create for developing country climate policy and how the US should manage these, the role that sectoral programs, as opposed to the project based approach best illustrated by the CDM should take, and what lessons the CDM holds for design of a carbon credit system aimed at reducing emissions from deforestation and degradation (REDD). I conclude the following:

(1) There has been and will continue to be substantial crediting of business-as-usual behavior within the CDM. This is particularly true for sectors such as electricity generation that are highly regulated by developing country governments.

(2) The US should use its market power in an international carbon offsets system to improve its environmental integrity by forcing administrative reforms and limiting its purchases to offset

categories where real reductions can be readily separated from business as usual

(3) US climate legislation should include both carrots and sticks to induce developing countries to give up offsets in favor of binding limits on emissions.

(4) The US should encourage the creation of sectoral baseline and credit schemes in developing countries by providing access to the US emissions trading market.

(5) The US should, it it allows REDD credits into a domestic emissions trading market, mandate both national deforestation baselines and minimum participation by tropical forest nations. Both are needed in order to reduce within-country and international emissions leakage caused by a large scale REDD program.

All offset markets, whether for GHGs or for criteria pollutants, face a tension between creating the right conditions for investment and insuring environmental integrity. On the one hand they must create sufficient investor confidence to induce participation. On the other hand, they must try to insure that payment is only made for actual alterations in behavior rather than what for would have happened anyway. These goals necessarily conflict because increased environmental oversight implies both greater oversight costs and also a higher risk that claimed reductions by a project will not be given credit.

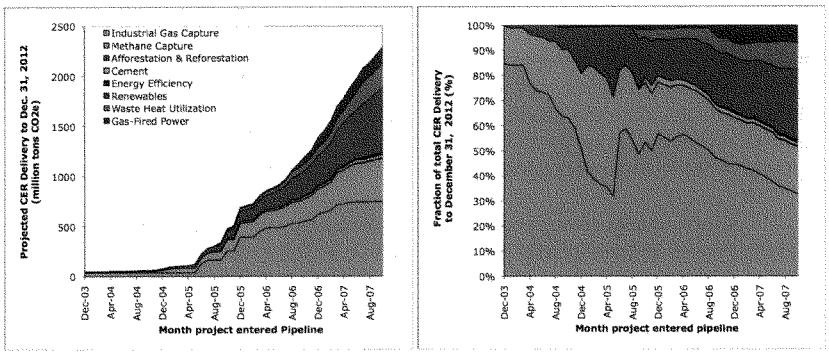
A carbon offset market, if perfect in both design and implementation, is a zero-sum game. Emissions are reduced at carbon offset projects. These emissions reductions then allow firms with compliance obligations to emit more than they otherwise would and at a lower per ton cost. If however, design or oversight is imperfect, with some offset projects securing credit for reductions that do not represent real alterations to their baseline emissions, getting paid to do what they would have done in any case, then emissions will be unchanged outside of the cap but higher within the cap.

Lessons learned from the Clean Development Mechanism with regard to environmental integrity in a mandatory cap-and-trade program to reduce greenhouse gas emissions

The CDM has struck the balance between investor risk and environmental integrity in different ways at different times as the market has developed since the CDM Executive Board (CDM EB), the market regulator, first began evaluating offset projects in 2004. Overall, I would argue that the market today presents both an unacceptable risk to investors and a portfolio of projects of dubious environmental credibility. Major offset project developers are in crisis because they cannot bring sufficient credits to market to meet their delivery commitments to compliance

buyers in the European Union Emissions Trading Scheme. At the same time, many critics of the program have amassed evidence that in too many cases, projects that almost certainly would have proceeded without assistance from the CDM are nevertheless being issued carbon offsets. One preliminary lesson to draw from this early outcome is that well designed offset markets should be limited to offset project types where assessing environmental credibility is simple and so cheap and low-risk. This will both increase the quality of the environmental outcome produced, help to insure investor confidence and hence

The growth of the CDM has been truly extraordinary. In 2007, the value of the CDM market totaled €12 billion, more than triple the previous year's figure. The CDM project pipeline has grown in four years from essentially nothing to more than 3000 projects either registered or in the process of achieving the necessary regulatory approvals. The project design documents for these projects together project that the CDM market will deliver more than 2.2 billion credits to the end of the Kyoto Protocol's compliance period (see Figure 1).



a. b.

Figure 1: Participation in the Clean Development has grown explosively over the past four years. Shown in (a) is the projected volume of Certified Emissions Reductions (CERs) delivered to the end of the Kyoto Protocol as a function of time. Different colors indicated different project types. Shown in (b), the same data, but expressed in percentage terms. Early on, industrial gas capture projects, most notable HFC-23 capture projects, dominated the supply of credits. More recently, renewable power and natural gas-fired power projects have been growing in importance.[1]

[1] Data courtesy of Jørgen Fenhann, UNEP-Risø Centre, CDM-JI Pipeline Database, *at* http://www.cdmpipeline.org.

The early history of the CDM is primarily the story of an obscure gas called trifluoromethane or HFC-23. This gas is a potent GHG and is produced mainly as a waste product during the manufacture of another gas (HCFC-22). The HCFC-22 is used in some air conditioners and as a feedstock for high performance plastics; it is a partial replacement for other gases that are being phased out because they harm the ozone layer. HFC-23 is 11,700 times more potent a greenhouse gas than CO_2. Projects that cut HFC-23 emissions are extremely valuable because they generate enormous volumes of carbon offsets, or in the CDM's terminology, Certified Emissions Reductions (CERs) at very low cost. In the early development of the carbon market, these projects made up the bulk of emissions reductions. (See Figure 1). They also accounted for the vast majority of financial value in the nascent, rapidly growing CDM market in 2004-2006 that sparked early excitement about carbon offsets as an investment opportunity.

The costs of capturing and destroying HFC-23 at refrigerant plants are non-zero but extremely low. In the U.S. and Europe, many factories producing this waste gas have since the 1990's voluntarily eliminated their emissions of HFC-23.[2] In the developing world by contrast, until the CDM, refrigerant factories simply vented this potent GHG. Because of the low costs of destroying the gas and its high potency, initially it was thought these projects would be ideal offset projects for the CDM scheme. At the same time, our work along with the highly successful fund within the Montreal Protocol on the ozone layer (which funded an analogous phaseout of industrial chemicals) suggested that these types of emissions should be handled outside of the Kyoto market system via a dedicated fund.[3]

Unfortunately, close scrutiny of the economics of HFC-23 projects revealed that they were, in many senses, too good to be true. Our work[4] and the work of others[5] showed that the sale of carbon credits generated from HFC-23 capture is far more valuable than production of the refrigerant gas that leads to its creation in the first place. Thus, refrigerant manufacturers were transformed overnight by the CDM into ventures that generated large volumes of CERs, with a sideline in the manufacture of industrial gases. In response to these perverse incentives, the CDM Executive Board implemented a number of restrictions that limited, but failed to

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[2] Indeed, technologies developed and deployed voluntarily in U.S. plants are the same as those that have been adopted in the CDM. A. McCulloch, *Incineration of HFC-23 Waste Streams for Abatement of Emissions from HCFC-22 Production: A Review of Scientific, Technical and Economic Aspects*, 18 (2005) *at* http://cdm.unfccc.int/methodologies/Background_240305.pdf (last visited April 14, 2008).

[3] David G. Victor and Gordon J. MacDonald, *How to Make Kyoto a Success*, 389 NATURE 777 (1997); David G. Victor and Gordon J. MacDonald, *A Model for Estimating Future Emissions of Sulfur Hexalfuoride and Perfluorocarbons*, 42 CLIMATIC CHANGE 633 (1999).

[4] Michael Wara, The Performance and Potential of the Clean Development Mechanism, PESD Working Paper #56 (2006), *available at, http://pesd.stanford.edu/cdm.*

[5] UNEP Technical and Economic Assessment Panel, Response to Decisiion XVIII/12, Report on the Task Force on HCFC Issues (with particular focus on the impact of the Clean Development Mechanism) and Emissions Reduction Benefits Arising from Earlier HCFC Phase-Out and Other Practical Measures (August 2007).

eliminate, the perverse incentive to produce refrigerant in order to produce waste HFC-23, capture this waste, and so create enormous quantities of CERs.

In the case of HFC-23 abatement, the CDM was also a startlingly inefficient means for achieving emissions reductions in the developing world. Payments to refrigerant manufacturers, the Chinese government (which heavily taxes these CDM projects), and to carbon market investors by governments and compliance buyers will in the end total approximately €4.7 billion while estimated costs of abatement are likely less than €100 million. Given limited funds to invest in developing world climate abatement, there is a need for mechanisms to access extremely low-cost emissions reductions via more cost-effective mechanisms. Elsewhere I have outlined such systems, which could include a project fund such as was done in the highly successful multilateral fund under the Montreal Protocol on Substances to Deplete the Ozone Layer.[6]

Over the last two years, awareness of the HFC-23 problem has grown and governments have tried to clamp down on these projects. By stemming the flow of HFC-23 credits while encouraging growth in other types of offset projects, it was thought, the CDM would at last encourage investment in activities that would deliver more fundamental changes in technology, leading to reductions in emissions. For example, it was thought that countries would invest in new energy systems that had much lower carbon emissions. Indeed, the CDM market has shifted, as shown in Figure 1—today, HFC-23 projects account for less than half of projected project deliveries, and that fraction is declining. The good news, in theory, is that most of the growth in CDM has been outside the HFC-23 sector (and projects involving other industrial gases with similar drawbacks). The bad news is that these new projects reveal even deeper problems with the CDM mechanism—problems that, for projects that could theoretically deliver the largest reductions in emissions, can't be fixed.

I focus my discussion on China because it is the most important developing nation in terms of GHG emissions and because current market trends indicate that more than half of all emission credits will likely originate in reduction projects based there.[7] I focus on the energy sector because it is fundamental to making a dent in GHG emissions and because it is where the fastest growth in the Chinese CDM pipeline is occurring. Energy projects are crucially important, and under the current rules such projects offer the greatest potential for future growth in the CDM.

In China, coal-fired power plants generate approximately 80% of all electric power. Most of the existing plants are older, inefficient designs, but most new plants being built are state of the art. And China is building new power plants at a truly

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[6] Michael Wara, *Is the Global Carbon Market Working*, 445 NATURE 595 (2007); RICHARD ELLIOT BENEDICK, Ozone Diplomacy: New Directions in Safeguarding the Planet, (2nd ed., Harvard University Press 1998).

[7] As of January 1, 2008, 53% of CERs issued to 2012 will be created in China, assuming that all projects currently undergoing validation are registered. Jørgen Fenhann, UNEP-Risø Centre, CDM-JI Pipeline Database, *at* http://www.cdmpipeline.org.

astonishing rate. During each of the past two years, approximately 100 GW of new electric generating capacity was constructed in China; rapid buildout of coal plants is expected for the foreseeable future in the country.[8] The astonishing rate of growth is equivalent to building the entire U.S. power plant fleet in less than a decade.[9] This new demand has put enormous strain on China's coal supply system, including its mines and railroads, as evident in the spate of blackouts in January. After many years as a coal exporter, China is now a net importer of coal. In addition to unreliable power, combustion of coal with dirty technologies contributes to the country's soaring rates of childhood asthma and the other ills of air pollution.

In response to these problems, the Chinese government has implemented a series of policies to both reduce the country's dependence on coal and to reduce the environmental impacts of electricity generation. China's current five-year plan, in fact, calls for major investments in hydro, wind, nuclear[10], and natural gas-fired power in order to diversify away from excessive reliance on coal. A 4,000 km long pipeline from the country's western gas fields to the booming cities in the east has been completed. A second, even larger pipeline is now under construction. In 2006, a Renewable Energy Law entered into force that provides strong financial incentives for development of new wind farms in China and sets explicit capacity expansion goals for the wind sector. Since 2004, China has been on a dam building spree, with 10 GW of new hydro power plant capacity being completed each year.

These changes in China's goals are evident not only in energy policy but also in China's CDM projects. Today, as illustrated in figure 2, essentially all new hydro, wind, and natural gas fired capacity is applying to claim credit for emissions reductions under the CDM. These power plants are at least potentially eligible for the difference between their emissions and the electricity they "displace" on the Chinese electricity grid. Under the rules of the CDM, each new dam, wind farm, or natural gas power plant applies individually and makes the argument that it would not have been constructed but for the financial incentives produced by the sale of carbon offsets.

Taken individually, these claims may make sense—because, individually, any particular power plant utilizing non-coal sources of energy probably faces greater hurdles than new coal-fired generation or may be financially marginal, and the ability to sell CERs offers the prospect of being able to compete toe-to-toe with coal.[11] Taken collectively however, these individual applications for credit amount

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[8] On the rate of power plant construction in recent years see: Keith Bradsher, *China's Green Energy Gap*, NEW YORK TIMES, October 24, 2007. For projections see International Energy Agency, 2007, *World Energy Outlook 2007* (Paris: IEA).

[9] The U.S. power plant fleet had a total nameplate generating capacity of 955 GW in 2006. *See* Energy Information Administration, Annual Energy Outlook 2008 (Revised Early Release).

[10] Nuclear power, although a source of low-carbon energy, is ineligible to participate in the CDM under the current rules.

[11] Additionality within the CDM is evaluated in a variety of ways. Projects show they are additional by comparing the proposed activity to what is required by regulation, to what is the most financially

to a claim that the hydro, wind, and natural gas elements of the power sector in China would not be growing *at all* without help from CDM. This broader implication is simply implausible in light of the state policies described above. That so many plants would come forward to claim credit as marginal indicates systemic problems with the CDM project evaluation and approval process. These problems are probably just the beginning, as efforts are under way to apply a methodology that would allow investors to gain credit for installing more efficient "supercritical" coal-fired power plants in China—despite the fact that many such plants are already being built without CDM credits and such plants are probably cost-effective in many Chinese power markets on their own.[12]

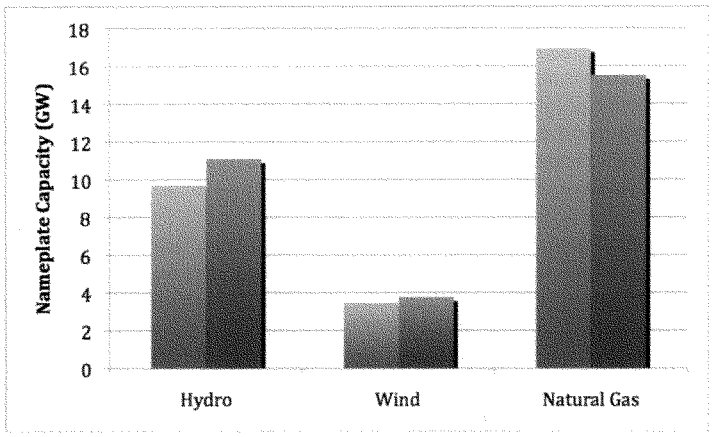

Figure 2: Hydro, wind, and natural gas fired power plants built or under construction in China compared to applications for CDM crediting for these projects. Essentially all new capacity (blue bars) is applying for CDM offset credit (red bars). Issued credits are based on the difference between these new energy sources and the Chinese grid GHG emission intensity. Shown are new capacity and CDM applications for Chinese hydro and wind power in 2007, and for natural gas-fired power in 2005-2008.[13]

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attractive activity under the applicable circumstances, and by assessing any other barriers to implementation of the project.

[12] In September, 2007, the CDM EB approved a methodology for crediting supercritical and ultra-supercritical coal fired power plants. *See* http://cdm.unfccc.int/methodologies/DB/C7O6IUA9OTNRUK4X619VX2A6OS4DU7/view.html. China has also been pushing construction of these plants as a response to the severe shortages of coal in southern China. *See* Information Office of the State Council of the People's Republic of China, China's Energy Conditions and Policies, (December 2007); *See also*, Keith Bradsher, *China's Green Energy Gap*, NEW YORK TIMES, October 24, 2007.

[13] Hydro and wind CDM applications exceed new capacity additions in part because some plants applying

These problems are not peculiar to the Chinese context. They reflect a fundamental challenge in any offset system. The host governments and investors that seek credit have a strong incentive to claim that their efforts are truly additional. The regulator—in this case, the CDM Executive Board—can't in many cases gather enough information to evaluate these claims. These problems of asymmetrical information are compounded in the CDM, to be sure, because the CDM Executive Board is massively under-staffed and the CDM system relies on third-party verifiers to check the claims made by project proponents. In practice, these verifiers, who are paid by the project developers, have strong incentives to approve the projects they check. Further, there is scant oversight on the integrity of the verification process and little record of punishing verifiers for misconduct. Lacking any other source of information about individual projects and facing pressure from both developing and developed country governments, the CDM Executive Board is prone to approve projects. Asymmetries of information are rampant; the incentives mostly align in favor of approval.

This challenge is made all the more formidable by the sheer number of projects upon which the Board must decide. The CDM EB, on average, registers about one project every day as eligible to generate CDM credits. Thus the Board cannot afford to spend large amounts of time evaluating the complexities of financial data presented to justify a project's eligibility for CDM credits nor can it delve into a project's relationship to state energy policy. Furthermore, the CDM EB faces a financial limit on the costs it can reasonably impose on individual offset projects. In order to remain viable, relatively small carbon offset projects cannot afford the cost and uncertainty that would accompany truly extensive scrutiny. Indeed, there is strong pressure from CDM investors to limit such transaction costs and speed up approval.

The US can take steps to enhance the effectiveness of an international offsets program such as the CDM

This description of the current state of the CDM leads directly to a number of policy recommendations. The US, because it will likely be the largest buyer in any international carbon offset market, will likely have significant influence over the rules governing the market. It should use this influence both to push for three major reforms to the CDM. First, the US should urge reform of the regulatory framework that currently governs the CDM to increase transparency, fairness, and accountability. Second, it should push for changes in the ways that third-party verifiers are compensated within the system in order to remove pervasive conflicts

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for credit in 2007 were built earlier and in part because some plants that applying for credit experienced construction delays. Data Sources: National Development and Reform Council; International Gas Union; International Energy Agency; Jørgen Fenhann, UNEP-Risø Centre, CDM-JI Pipeline Database.

of interest that likely lower environmental standards in impossible to monitor ways. Third, the US should limit its purchases of international offset credits to those offset project types where evaluation of additionality is relatively less complex and so more likely to be accurate.

The current governance structure of the CDM needs overhaul. In essence, the market is run by a part-time board of political appointees who, while operating in a quasi-judicial role, is not required to give reasons for its decision and is not bound to follow precedent or even explain why current decisions deviate from past practice. All this needs to change. The CDM EB needs full time attention from experts in the area of carbon offsets. The US should demand as much. It should also work to compel the board to give reasoned explanations for its decisions to approve or disapprove projects. Without such a case law, it is both difficult to assess the standards that the board is applying and to judge whether a project will likely survive scrutiny or not. This leads to perceptions of arbitrariness on the part of both project developers and environmental NGOs alike. Finally, the board should, at a minimum, have to explain why its current decisions deviate from past practice when it decides to change course. While not necessarily being compelled to follow its own precedents, a requirement to explain course changes will provide important insights into the reasoning behind CDM EB decision making, thus increasing both predictability and transparency. All this will allow both market participants and critics of the system to better assess its performance.

Third-party verifiers play an essential role in the implementation of international carbon offset systems. They check that the claims made regarding the additionality of projects are correct. They also monitor compliance with promised emission reductions by offset projects. Yet they face a series of incentives that likely leads them to cut corners in ways that compromise their effectiveness in these roles. First and foremost, verifiers in the CDM are currently hired and paid by the project developers, most of whom are repeat players in the market. Thus verifiers have incentives to please their client rather than to exercise rigorous oversight. In addition, verifiers must bid competitively for verification contracts, which creates incentives to cut corners and lower the stringency of audits. The US should act to remedy this situation by requiring that the regulator rather than the project developers contract for and pay third-party verifiers in any offsets system from which it purchases credits.

Finally, as has been illustrated in the previous sections description of the Chinese energy projects participating in the CDM, there are some sectors where a combination of factors make the determination of baselines a very difficult endeavor. These factors include a coincidence of climate and energy security concerns, heavily regulated industries that lack market signals, pervasive participation in these sectors by state owned entities, and project business models where the cashflow attributable to the CDM is a very small proportion of total income earned by the project. The US should, rather than attempting to design a system that can identify the wheat from the chaff in these sectors, simply opt not to purchase offsets from them. Limiting access to US markets to the offset project

types where evaluation of additionality is more straightforward will go a long way towards improving the environmental credibility of any international carbon offsets program.

The US should create incentives for developing countries that participate in a US international offsets system to eventually take on binding emissions limits

The ability to produce and sell carbon offsets is a potential asset on a firm's balance sheet. In contrast, the requirement to comply with a cap-and-trade regime is an environmental liability. This difference illustrates why creating an expectation on the part of developing countries or developing country firms that they will be entitled to produce and sell large numbers of carbon offsets to the US may prove problematic in the medium- to long-term. Carbon offsets are intended to be a bridge - both for developing countries and for developed country firms - to a future where the former accepts caps and the latter adopts new technologies as they become available. In order to insure this future, it is important that medium- and long-term expectations be set at the outset.

The CDM does help developing country firms and governments take important steps down the road towards an eventual cap on emissions. It familiarizes participating firms with the accounting tools that will be necessary and with the sort of planning and business decision making that will be essential to ultimate compliance with a cap-and-trade regime. At the same time, it creates expectations on the part of some offset projects of up to a 21-year lifespan. Thus a project begun today might expect to be generating credits for sale in 2040. But by 2040, major developing countries, especially China and India, where most CDM projects currently exist, must have accepted caps on their emissions or the global project to limit damages from GHGs will likely have been undermined. Congress should set clear and explicit limits on the term during which the US will accept international carbon offsets from nations that have not entered into binding limits on their emissions via international agreement.

Limitations on future purchase of offsets designed to minimize developing country incentives to avoid caps might take three forms. First, Congress could set explicit dates in climate legislation at which time the volume of offsets that firms could utilize for compliance with a US cap would decrease. Second, Congress could set a date certain in climate legislation after which offsets from countries which have not taken on an economy-wide cap on their emissions would not qualify for use within the US emissions trading system. Finally, it may also be possible to modify the rules of the CDM so that current and future international carbon offset projects will be difficult or impossible to renew beyond their initial seven year terms.

Finally, it should be emphasized that the US holds a potentially valuable carrot to induce developing countries to accept a cap and give up offsets, at least within capped sectors. This is access to the US emissions trading scheme without ny

quantitative limits. Many legislative proposals have limited the number of international offsets that may be utilized within the US cap-and-trade. EPA and EIA modeling suggest that these limits may be binding on regulated entities within the caps, at least initially. Thus providing for full market access to the US emissions trading regime for developing country cap-and-trade programs that make acceptable efforts to reduce emissions could provide a substantial increase in revenue flows while also providing continued cost-control for US firms.

The US should Encourage the development of sectoral, as opposed to project-based offset systems in major developing countries as a bridge to accepting caps

Many of the sectors that have proven so problematic to include within the CDM because of difficulty with additionality might be better included, even within an international offsets mechanism, at the sectoral level. There have been numerous recent proposals along these lines for key sectors within China and India. The basic idea is that a sector of a nation's economy would accept a target for its GHG emissions in a future year. If it met or exceeded that target, then the sector would generate credits that could be sold to developed country emitters, in much the same way that CDM credits are today. If it failed to meet the target however, it would not face any sanctions.

The advantage of such a proposal is that it moves from project-by-project assessment of additionality to wholesale assessment of changes in emissions within a larger segment of an economy. This allows for perhaps more honest assessment of trends in adoption of new technologies and their impact on baseline emissions. Also, for sectors like electricity generation, that are highly regulated, a sectoral approach brings the regulator, and the influence it can exert upon firms, into the discussion of target setting. As can be seen from the Chinese power sector projects, this is an essential component of baseline and credit systems in the power sector, whether they are project-based or sectoral in approach.

Implementing a sectoral approach will not be without substantial challenges. Questions that remain to be addressed include just how to set sectoral targets, how these targets will be monitored and enforced in practice, and how the risks and benefits of a sectoral approach will be distributed across the sector, presumably by the government agency responsible for the program. All of these are, difficult problems to resolve for any nation's climate policy. Note however that these are very similar to the issues and challenges that must be overcome if a nation is ever to agree to a cap on its emissions. Thus sectoral approaches represent a transition phase between a project-based offsets regime and more rigorous binding limits on emissions. We should encourage and assist developing countries that are interested in attempting to implement such programs in doing so by providing priority market access to the US emissions trading system for any credits that they generate.

Include Reduced Emissions from Deforestation and Degradation (REDD) only if national baselines can be negotiated and if participation on the part of major tropical forest nations is substantially complete.

Emissions from tropical deforestation represent somewhere between 17 and 25% of global GHG emissions. The uses to which deforested lands are typically put in tropical developing countries have relatively low values when compared to the carbon value of leaving the forests intact. This combined with the fact that many groups have long promoted preservation of tropical forests in order to preserve biodiversity has led to the promotion of REDD as an alternative international carbon credit mechanism.

One key question in the design and implementation of a REDD program, either under US law or via international agreement, upon which CDM experience may shed light is whether to set baseline emissions at the project or the national level. On balance, the CDM experience argues strongly for a national, rather than a project-by-project approach. Two arguments support this view. First, experience in the CDM has shown that in sectors where government is an important player, a project-by-project approach is problematic. Second, emissions leakage concerns arise for avoided deforestation projects that are difficult if not impossible to address at the project level.

The forestry sector, much like the electricity sector, is one that in most countries is highly regulated. It is also one in which there are significant legal and regulatory issues, both as concerns property and land tenure rights and illegal cutting of timber that lead to higher emissions. Carbon markes require clear chain of title and enforcement of the right to exclude individuals from protected forests. One recent study suggested that four times as much timber is exported from Vietnam as is legally harvested there. Both sets of concerns are only addressable via improvement of developing country institutions. These types of concerns suggest a role for a sectoral, as opposed to a project-by-project approach. By setting national baselines and administering a carbon credit system at the national as opposed to the project level, key agencies within developing countries can be given both incentives and resources to improve land use practices in ways that benefit climate.

If REDD becomes a major component of US or EU climate policy, the money provided to preserve forests in major forest nations will have a major impact on land use patterns. These patterns are currently driven by agricultural commodity and timber prices. With the advent of large-scale REDD policies, these other influences will not cease. Far more likely is that they would be displaced to areas not subject to the influence of REDD. Thus trees preserved in one location will create stronger incentives to cut down forest elsewhere. And the more successful the REDD program, the stronger these incentives to create deforestation GHG emissions in other locations will be. This problem, called leakage, suggests two key features of a successful REDD policy: national baselines and minimum participation requirements. By setting objectives for REDD at the national rather than the project

level, leakage within individual developing countries can be managed. By setting minimum participation requirements – for instance that a majority of tropical forest land and a majority of tropical forest nations must opt in to the program in order for it to take effect, the US might substantially limit these leakage problems.

Conclusion

Carbon offsets, and international carbon offsets in particular, pose substantial risks to the environmental integrity not to mention the public reputation of a US emissions trading system. Learning and applying the lessons of the CDM can play an important role in minimizing these risks. Still, any large offset program is likely, at least to some extent, to allow crediting of non-additional projects while creating incentives to defer acceptance of a cap on emissions. While these problems cannot be eliminated, they can to some extent be reduced by smart design choices. The US, because it will likely be the largest purchaser of carbon offsets in the international emissions trading market, should use its clout to make sure that the right decisions are made.

Mr. MARKEY. Thank you, Mr. Wara, very much.

We will now turn to questions from the subcommittee members, and the Chair will recognize himself for a first round.

I would like to ask, first, a yes-and-no question to all six of you, and that is on the merit of establishing an independent science advisory committee to help guide EPA's development, implementation, and updating of an offset program. Would you support the inclusion of such a mechanism inside a Federal climate piece of legislation put on the President's desk, an independent science advisory committee to guide EPA's deliberations?

Mr. Stephenson?

Mr. STEPHENSON. That is not really a yes-or-no question, but "yes" if it is part of an overall verification scheme for offset programs.

Mr. MARKEY. OK, great.

Mr. Gero.

Mr. GERO. With the caveat that we don't take advocacy positions, I think that any stakeholder group, including scientists, is important to ensure the credibility of offsets.

Mr. MARKEY. Thank you.

Ms. Figdor.

Ms. FIGDOR. Mr. Chairman, by all means, yes. And I would add that this body, an independent advisory board, should be the ones who are determining what types of projects, if any offsets are allowed, what types of offset projects would be allowed.

Mr. MARKEY. Thank you.

Mr. Martin.

Mr. MARTIN. Yes. And I would encourage that committee to engage at the international level, as well.

Mr. MARKEY. Great, thank you.

Mr. Eizenstat.

Mr. EIZENSTAT. Yes.

Mr. MARKEY. Yes.

Mr. Wara.

Mr. WARA. I agree. I think it is essential.

Mr. MARKEY. OK. Next I would like to focus on the potential role of international offsets in U.S. climate legislation. We don't want international offsets to become some kind of a welfare system. To get the kind of global emission reductions we need, we have to encourage major developing countries to take broad action on climate change.

Several of you have testified about the potential to use access to the U.S. carbon market as a lever to encourage such action. You have mentioned the idea of moving to sectoral instead of project-based offsets, and you have also talked about requiring developing countries to take on a progressively greater domestic commitment as a condition of being able to sell offsets into the U.S. market. I would like to ask you to expand upon your views on that subject.

We will begin with you, Dr. Wara; then we will come back through you, Ambassador.

Mr. WARA. Well, let's see. International offsets have been, historically, an important part of encouraging developing-country engagement in international frameworks to address climate change. There is no question about that.

But, in the long run, offsets only engage at the margin. They are not likely to lead to the truly substantial reductions and, really, alteration in development path that we need to accomplish in developing countries in order to fully address this issue and to make U.S. efforts worthwhile.

In that context, and especially in sectors, I would argue, sectors where regulation plays an important role—and what I mean by that is, in particular, the energy sector in developing countries—I think we need to really focus on talking to the regulator to address policies that discourage greenhouse gas emissions, rather than simply focusing at the project level, at the power plant level. Because, in many respects, the power plants do what the regulators tell them to.

Mr. MARKEY. Ambassador Eizenstat?

Mr. EIZENSTAT. International credits are absolutely essential. They are essential, number one, to incentivize developing countries to finally participate in the process when they will not initially take economy-wide cap-and-trade limits of their own.

Number two, Mr. Upton, this is not, sir, a transfer of U.S. taxpayer dollars to developing countries. This is a private-sector decision by a private U.S. company that may wish to reduce its cost of compliance by purchasing an international credit. It is not the transfer of a U.S. tax-based dollar.

Number three, there have been discussions about the EU ETS—I was Ambassador to the EU—and the CDM. The CDM was something we reluctantly agreed to because it was the only way at the time to get China, India, and the developing countries to agree at all. It is a bureaucratic nightmare. It is nothing like the kind of market-based system we are talking about now internationally. It should not be used as a model. The Europeans and the ETS don't believe in offsets; they don't believe in reducing the cost on industry. That is their problem. We should care about reducing the cost on industry, or we won't get a bill.

So international offsets incentivize developing countries, they provide a market mechanism, and they reduce the cost for U.S. companies to comply, and they are verifiable.

Mr. MARKEY. My time has expired. The Chair recognizes the gentleman from Michigan, Mr. Upton.

Mr. UPTON. Thank you, Mr. Chairman.

I have a whole series of questions, and I want to focus a little bit on what the EU does. They, as I understand it, can do offsets both within the EU as well as internationally, is that right? Collect international offsets as well as get offsets from within the EU itself?

Mr. EIZENSTAT. They can through the CDM mechanism, but, as I said, the CDM mechanism is an inherently flawed mechanism.

Mr. STEPHENSON. Well, the offsets are only for developing countries.

Mr. UPTON. Right. And the offsets outside of the EU are only for developing countries.

Mr. EIZENSTAT. They can't do it within the EU.

Mr. UPTON. They cannot do offsets within the EU?

Mr. STEPHENSON. Correct.

Mr. EIZENSTAT. They can have internal trading, emissions trading within the EU, within the 27, but they can only do offsets outside.

Mr. UPTON. What lesson might we learn from the example that we used, that I referenced in my opening statement, as it related to the $90,000, in essence, that was sent to North Dakota for no-till for an offset from the U.S. capital funds here? In terms of reliability, would they have done that otherwise? I mean, that is an essential ingredient that has to be part of any definition, in fact, that we would make sure that it was going to be done and perhaps outside of what would have been done otherwise.

Mr. EIZENSTAT. The additionality, Congressman Upton, in terms of the forestry sector, is absolutely clear. And the reason is this: The incentives to cut forests in developing countries are so enormous that the notion that somehow they would stop doing it absent these incentives just doesn't have any credibility at all.

They are cutting them down, as I indicated, at the rate of one football field a second, because there is such tremendous incentives to cut and plant and export. So we are not dealing, at least in the forestry sector, with an additionality problem.

Mr. UPTON. Now, China was in Dr. Wara's testimony, got nearly 5 billion euros for emission reductions. China, at the same time, as you know, particularly as we look at deforestation in Africa, is part of the clear-cutting along the eastern Mozambique, all those countries.

Here, China is a beneficiary of this and, at the same time, they are a major force in deforesting the world's forests as it relates to carbon.

Mr. EIZENSTAT. The reason is that the CDM is a project-by-project concept which does not provide real incentives for avoided deforestation. You need a full market-based mechanism which provides billions of dollars through the private market to provide those incentives. The notion that an individual project here and there in China or in Indonesia is going to have any impact simply doesn't do the job.

Mr. UPTON. Dr. Wara, in your testimony, you indicated that you thought that the offsets that paid China nearly 5 billion euros could have been done for less than 100 million euros. Get into that a little bit.

Mr. WARA. Yes, sure. So the issue there has to do with what are known as the industrial gas projects in the CDM, which are projects that capture process emissions from industrial facilities that emit gases that are many times more harmful, thousands times more harmful than carbon dioxide.

And the fact of the matter is that those emissions have been captured voluntarily by some manufacturers in the U.S.—DuPont, for one—for many years now. And the factories in China that were emitting these emissions—because they had no incentive to capture them. It does cost money. And DuPont, I think, does this for brand value in the U.S., because they care about their environmental and sustainability portfolio. But in China there was no incentive to capture the emissions.

The cost of capture is incredibly low, and yet the market price of the credits is so high that, effectively, these factories make now

more money from capturing emissions than they do from manufacturing the products that they were created to produce.

Mr. BOUCHER [presiding]. The gentlelady from California, Ms. Capps, is recognized for 7 minutes.

Mrs. CAPPS. Thank you, Mr. Chairman. And thank you for acknowledging that I have a couple extra minutes. I have three questions to ask three different people, so we will have to keep the answers, I suppose, a little short.

I will start with you, Ms. Figdor. We have discussed today the various merits and drawbacks of including offsets in climate change legislation, a complex topic. And if we include offsets in climate change legislation, we have to make sure we do it right. I have gotten that message from all of you, I believe.

As we explore the topic further, I am concerned about proposals that have emerged to use our oceans as places to sequester carbon. Ms. Figdor, what might be the consequences of using the ocean for carbon sequestration? And do you think these techniques, such as iron fertilization, should be considered as potential offsets in climate legislation?

Ms. FIGDOR. Thank you.

I absolutely do not believe that ocean fertilization should be considered as a potential project type able to receive offsets under a cap-and-trade bill. Ocean fertilization is not a proven method of sequestering CO_2. According to the Intergovernmental Panel on Climate Change, they call the technology, quote, "largely speculative and unproven and with the risk of unknown side effects."

So, in fact, creating an offsets market could have a very perverse incentive of, first of all, not actually resulting in real, verifiable cuts in emissions or reductions in pulling carbon out of the atmosphere. And, in addition, it could have very serious repercussions that we are currently not aware of. So this is one of the worst ideas, in terms of types of offset projects.

Mrs. CAPPS. Thank you. I wanted to get that on the record.

Ambassador Eizenstat, I have visited the Brazilian Amazon, and I have seen firsthand, myself, the destruction wrought by deforestation. And I have also noted the wide variety of groups that have been making efforts to protect these forests and their biodiversity, including through the extensive development aid.

You have been very strong in your statement of need for doing these kinds of things under a market framework. You say the incentives are completely realigned for developing countries.

What I would like to ask you, but you can expand on that for a minute if you would like to, but I am very concerned, the timing being what it is, about the period before a cap-and-trade program could be up and running. Are there steps we should take immediately to assist developing countries in controlling deforestation while the other programs are under way?

Mr. EIZENSTAT. Well, time is really running against us, as you indicate. Brazil just made this announcement a few weeks ago about taking a first-ever cut in their massive rate of deforestation. I mean, what we can try to do is, through diplomatic means, ask them, in effect, to stop and implement already the commitment they have already made, in return for which there would be, in ef-

fect, an early-action credit, something that could be credited against their action at a later point in time.

So that we want to do that, frankly, with companies as well. I am on the board of the Chicago Climate Exchange, and they have a verifiable system. If you have early-action credits for companies, that should be a part of any legislation, so that companies are incentivized before the legislation passes. It may be a year or two before——

Mrs. CAPPS. Right.

Mr. EIZENSTAT [continuing]. And, even then, there will be an implementation phase and then an implementation phase.

So I think providing these kind of early-action credits for countries like Brazil or for companies would be an integral way to try to encourage them to act now and not wait until this carbon market gets established several years from now.

Mrs. CAPPS. Thank you. I appreciate that very much. Thank you, Ambassador.

Now I will finish my question time with you, Mr. Gero. Last winter—and I am a California Representative—the California Climate Action Registry verified emission reductions from the Garcia River Forest Project in California. This was a joint project of The Conservation Fund and The Nature Conservancy and PG&E. PG&E announced the purchase of 200,000 tons over 5 years for its ClimateSmart program.

There has been a lot of debate over the success of voluntary carbon markets. The Garcia River Project is an example of a successful, I hope you agree, voluntary carbon market. Would you tell us or share with us what made this program work where others have failed? And then follow it up with what lessons can be learned and applied at the Federal level by such voluntary efforts.

And if there is time, I will ask other people to join in, as well.

Mr. GERO. Thank you for that question. And the Garcia River Project is, I think, a prime example of the kind of activities that the carbon market—the voluntary and ultimately a regulatory carbon market could incentivize. Here, the incentive provided by the offset allowed The Nature Conservancy and The Conservation Fund to buy land that would otherwise have been developed and put it under a sustainable management plan.

With our protocols, we were able to quantify what the distinction was, or the delta was, between standard practice, business as usual, what would have occurred on that land and, in fact, the management plan that The Conservation Fund implemented. Based on those standards—and those standards are performance-based—we were able to generate credits as a result of the verification of that activity.

Our standards are written by stakeholder groups that include scientists, industry, academics and others. And I think that that is a model that can be used in the Federal system, as well, that you need to have all of the stakeholders around the table deciding on what are good, credible standards.

I think the other thing that the Garcia River Project points out is that openness and transparency is important. Absolutely every step of the way with that project, stakeholders were engaged, people were able to see what was going on, what the management plan

was, what the rules were, what the verification activities were. And, ultimately, when that project was verified, those credits were issued on a serialized basis so that when PG&E and others purchased them, it is clear who owns those credits. And I think that all goes to creating a credible system.

Mrs. CAPPS. And so you would suggest, by this, that projects like the Garcia River Forest could serve as examples and models, that we don't have to start from scratch, we can look to the voluntary sector or the private sector as we seek to develop pathways to Federal regulation.

Mr. GERO. Absolutely. I think that a lot of good existing infrastructure has been created in California through the California Climate Action Registry. Our protocols in our system I believe are world-class, and that infrastructure and those systems can and should inform a Federal system.

Mrs. CAPPS. Thank you very much, Mr. Chairman.

Mr. MARKEY [presiding]. The gentlelady's time has expired. The Chair recognizes the gentleman from Texas, Mr. Barton.

Mr. BARTON. Thank you, Mr. Chairman.

I am in, obviously, a dilemma here. I don't believe we have a need for a cap-and-trade program, but I will admit that if we are going to have a cap-and-trade program and you could figure out a way to make an offset program work, it would be a good thing.

So I could go either way on this. I could try to define a program that is really tough but, if you implemented it correctly, it would work. Or I could try to implement a program that is so lax that it, on paper, works but it doesn't cost anything, and makes it easier to comply with.

So you have put me in a real box here, Mr. Chairman.

I do want to compliment Mr. Stephenson on his educational choice. I, too, went to Purdue and got a master of science degree in industrial administration. And you have, I think, an industrial management degree or industrial engineering degree. So I appreciate that.

Mr. Stephenson, is it fair to say that the studies that the GAO has conducted so far on these offset programs, if I had to just put it in a one-sentence conclusion, the existing programs just don't work and are almost impossible to make work?

Mr. STEPHENSON. That has been the case with the CDM. It is a pilot program. They are addressing problems and trying to get it right the next time.

But the problems of trying to determine what someone is going to do in the future is different than it is doing today is just an insurmountable barrier, quite frankly. And the bureaucracy to verify that, in fact, that is happening would be pretty large.

Mr. BARTON. Ambassador Eizenstat, first of all, thank you for testifying. It is really good to have somebody with your expertise and credibility before the panel.

As I understand your testimony—again, I try to simplify things so that, if I can understand it, hopefully other people can too, because I am a pretty good case since I am probably below average in ability to understand these things. If we keep——

Mr. MARKEY. Can I just—you wouldn't have gotten into this program at Purdue if that was the case.

Mr. STEPHENSON. That is what I was going to say.

Mr. MARKEY. But the problem is, he is very humble but he is proud of his humility.

Mr. BARTON. They may have had a Texas set-aside, you know. You never know.

If you prevent a forest from being cut down, you get the benefit of keeping the sink, which sequesters CO_2, plus the benefit of not the deforestation releasing greenhouse gases. Is that correct? You get a double benefit?

Mr. EIZENSTAT. You get a double benefit. It absorbs carbon, and, if you cut it, it releases carbon.

Mr. BARTON. Now, I am told that the whole issue of deforestation projects is extremely complicated to verify. So my question to you would be: Under international law, would it be possible for multinational corporations, consortiums, or sovereign nations to purchase forests to prevent the deforestation of that forest and also keep the carbon sink in place? Would that be possible?

Mr. EIZENSTAT. First of all, in terms of your own humility, I have had the privilege of testifying before you many times. You are not one of the cases of Lake Wobegon, where all the children are above average. I can assure you of that.

The GAO study, first of all, dealt only with voluntary markets and with a highly flawed CDM process. With respect to the international markets that you are talking about, if you have a combination of highly sophisticated satellite telemetry, plus on-the-ground monitoring, you have a high degree of verification that countries will not be cheating.

And, if they do, you set up a mechanism in which you hold back, say, 20 or 25 percent of the credits, you bank them in effect, or you hold back the economic benefits that would occur, so that if there is a change in policy, if there is an effort to cutback a forest in another way, you can see it from above, you can monitor it from below, and you draw down that credit against them if they attempt to do so.

Now, in many cases, the people who will manage these forests will be private companies and private-sector entities who will go to Brazil and say, "Look, we will manage this for you for a fee," and it will work that way. But, again——

Mr. BARTON. I have one more question to ask, and I know my time is about up.

I want to ask Mr. Gero, your job in California is to try to verify these offset programs are real, is that correct? I mean, your organizations.

Mr. GERO. That is correct.

Mr. BARTON. You are doing the best you can to really try to make sure it works.

I want to ask you a specific question. If I move to California and I purchase an existing coal-fired power plant and replaced it with an equivalent megawatt output nuclear power plant, would that qualify as an offset program?

Mr. GERO. Under our protocols, no, we don't have a protocol specifically for that activity. Our program has developed, set up protocols for specific activities. These are programmatic protocols. We don't have one for fuel-shifting.

Mr. BARTON. OK.

Thank you, Mr. Chairman.

Mr. MARKEY. The gentleman's time has expired. The Chair recognizes the gentleman from Utah, Mr. Matheson.

Mr. MATHESON. Thank you, Mr. Chairman.

The EPA estimates that the forestry and agricultural sectors can offset as much as 12 percent of this country's total annual emissions. So this sounds like an opportunity to reduce emissions more cheaply if these are real offsets. But I am concerned that an offset market could end up being just another subsidy program for certain parts of our economy, like the farm bill.

There are certain interests in this country that are going to view this and look to take advantage of it. And I think it is really important, if we are going to design some type of offset system, that we make sure it is structured in a way that it does not just become another subsidy program.

So everyone here has said they need to be measurable, verifiable, enforceable. That seems to make sense, but I just think we need to put that in the context of how a lot of people will look to game this system if it isn't set up right.

It also seems clear from the testimony that designing this type of program is going to require some pretty complex and serious scientific and technical questions about how to measure changes in emissions. If we don't have a verifiable system in place, we are going to have a situation where a company can sell low-priced offsets that don't really have any integrity. And, in the competitive marketplace, because they are so low-priced, the other company that is trying to do the right thing and will have a higher price is going to be left out of luck.

So those are, sort of, general concerns I have, in terms of how you are going to structure some type of offset program.

I want to ask the panel—it has been discussed, the notion of creating a board of scientists to provide input on design and review of offset projects just to make sure we hold everyone to the right standards. But I am interested if people have other comments about what model we should have in mind for this board, why it should be housed at the EPA and not at other Federal agencies. And if someone wants to respond to that line of questioning?

Ms. FIGDOR. I would be happy to at least start off.

The EPA currently, for setting national ambient air quality standards, seeks the advice of FACA Chartered Science Advisory Board, an independent board that, over the years, has proved very successful in providing EPA the latest science and technical information needed to set our air quality standards. I believe that model has worked very well and could be a model for use in an offsets program, if such a program is formed.

And then it should, first and foremost, be housed at EPA because the goal of this program is to reduce global warming emissions. It is an environmental goal, and the environmental agency should be in the lead actually—certainly consulting with other agencies as well, but should be the lead in establishing and monitoring the system.

Mr. STEPHENSON. I would just double that. EPA is responsible for the Clean Air Act. It already has a Clean Air Advisory Com-

mittee that does things like this, so it makes sense that that would be the place to start.

Mr. MATHESON. OK. It seems to me—oh, go ahead.

Mr. MARTIN. If I could, so I agree that it needs to be with the EPA. But to the extent—you are right, some of these issues are very technical, and it requires specific knowledge in very diverse areas, from forestry to agricultural methane, et cetera. So, to the extent that you can engage with the private sector to get all of that expertise, I think is a win for both sides.

Mr. STEPHENSON. The advisory boards are made up of many private-sector participants and academic participants, as well.

Mr. MATHESON. Does that model that we have done, in terms of the Clean Air Advisory Committee, is it set up in a way that I think this should be set up, where, in addition to taking scientific opinions, we also ought to have on-the-ground experience and actually be out in the field measuring to make sure this is working, is that type of model going to accomplish those goals I just mentioned, of that on-the-ground focus as well?

Mr. GERO. I can take a shot at that one.

I think that you need to both—or, actually, all of those activities. So, one, you need strong standards, as you have said, that are written by a group of stakeholders to bring them credibility.

But then those standards, when they are implemented, do need to be verified on the ground in each project. And that is where you go out and you measure; you look at metering equipment. If it is a forest, you actually do plot samples and measure trees. You make sure that the project is, in fact, performing in accordance with the standards, and only then do you issue any credits. They are always on an ex-poste basis; that is, activity reductions that have actually occurred in the previous year, not on a future basis, so you know for certain that those are real emission reductions.

Mr. MATHESON. OK. So we set the standards, and then we go on around to verify it. And then my next question is, once we have set the standards and we are verifying what is going on, then we learn from experience, how can that board then be structured so it is going to maybe add to the list of acceptable offsets or remove items from the list that don't work? Is there a way to structure the board to make sure it has that type of flexibility?

Mr. GERO. I think that is absolutely vital. In fact, that is part of the program that we have developed. None of our standards or protocols are static documents. They are all dynamic documents that learn from experience and from the state of science as science progresses. So you do need to regularly review and update the protocols themselves. I think that, without that, you have a program that is stuck in the mud, essentially.

Mr. STEPHENSON. Let me just say that the board is sort of a test of reasonableness, but it is not the implementer. You still are going to need an army of estimators and verifiers and monitors to make sure that any offsets would remain viable and in place for many years.

Mr. GERO. I think the last point on that is that additionality itself changes over time. So something that is additional today, that is surplus today, when you are looking at standards 2 years from now or 3 years from now when you do an assessment, if that

activity has become commonplace, that is no longer additional. And you are right, there is a process for removing that from the list.

Mr. MATHESON. How do we make sure under this structure, on a going-forward basis, how do you make sure you prevent the marketing of questionable offsets in the market, as we go on over time? I mean, there are going to be vendors all over the place, saying, "Have I got a deal for you." So how do we ensure that we don't—how do we screen out those questionable offsets?

Mr. GERO. The model that we think about—and we use this analogy a lot—is either an organic seal of approval, so there is some Federal standard that says, "Here is an offset that has an organic seal of approval," or a UL listing, "This is a certified offset credit that has met some standards set forth by the U.S. Government." Any other credits that are sold out there are sold without that seal, and it is buyer beware.

Mr. MATHESON. Thanks, Mr. Chairman.

Mr. MARKEY. The gentleman's time has expired. The Chair recognizes the chairman from Illinois, Mr. Shimkus.

Mr. SHIMKUS. Thank you, Mr. Chairman.

Last year we had a hearing called "The Cost of Inaction," and I asked the panel, is there a cost of increased energy in a climate change bill? And I would ask you for a yes or no answer: Will this increase energy cost?

Dr. Wara, why don't you go first, and just go down the panel.

Mr. WARA. I think the honest answer is yes, it is likely.

Mr. SHIMKUS. Thank you.

Ambassador.

Mr. EIZENSTAT. Yes, but very——

Mr. SHIMKUS. Thank you.

Mr. EIZENSTAT. Excuse me?

Mr. SHIMKUS. Thank you.

Mr. Martin.

Mr. MARTIN. With all due respect, it is not a yes-or-no question.

Mr. SHIMKUS. But quickly.

Mr. MARTIN. Yes, the offsets are there to contain the costs.

Mr. SHIMKUS. Thank you. Because we are putting a price to carbon is what we are doing. And if 50 percent of electricity today is carbon, you are going to add more cost. So, I mean, I think the answer is pretty clear.

Ms. Figdor.

Ms. FIGDOR. It absolutely depends on how you structure the program. If you invest heavily in energy efficiency, you can actually——

Mr. SHIMKUS. Well, just to the basic question, will energy costs go up?

Ms. FIGDOR. It depends how you structure the program.

Mr. SHIMKUS. So you can't give us a yes or no?

Ms. FIGDOR. It really depends on the——

Mr. SHIMKUS. OK.

Mr. Gero.

Mr. GERO. It is not my area of expertise. I really can't comment.

Mr. SHIMKUS. OK. Has energy cost gone up in—you know, California, being one of the highest energy cost States in the Nation, is energy cost up in California?

Mr. GERO. We don't have a cap-and-trade program in place today, so——

Mr. SHIMKUS. No, I was just—Mr. Stephenson?

Mr. STEPHENSON. It is impossible to give you a yes or no, but——

Mr. SHIMKUS. And you shouldn't really, as GAO.

Let me refer, Mr. Chairman, if I can add to the record an editorial from the Detroit News from yesterday, "Cap-and-Trade Plan Will Sink Michigan."

"President Obama's proposed cap-and-trade system on greenhouse gas emissions is a giant economic dagger aimed at the Nation's heartland, particularly Michigan. It is a multi-billion-dollar tax hike on everything that Michigan does, including making things, driving cars, and burning coal."

So if I could submit that for the record, I would like to do that.

Mr. MARKEY. It will be included in the record, without objection.

[The information was unavailable at the time of printing.]

Mr. SHIMKUS. If we are going to monetize the cost of carbon, and we have all these problems with the CDM and these voluntary systems, why not a carbon tax? Mr. Martin?

Mr. MARTIN. I will take a stab at that one.

So the difference between a carbon tax and a cap-and-trade program is the cap-and-trade program gives you environmental certainty. It tells you what your emissions are going to be over time. With a carbon tax, you have certainty over the price, but you don't know what results——

Mr. SHIMKUS. So you don't trust the government that is collecting the tax to use the money to mitigate the climate issues. I mean, that is really the debate.

Mr. MARTIN. It is not so much that. You just don't know how much effect that price will have.

Mr. SHIMKUS. Well, no, I think it is. Let's propose this: We have a presidential budget that has $646 billion in it for, in essence, this cap-and-trade program. Would it be intellectually dishonest if not every single dollar of that tax would go to mitigate the effects of climate?

Mr. Wara.

We have great experience in this committee about us passing on taxes and not using the money for what its intended purpose is; i.e., the Nuclear Waste Fund is a perfect example. If we are in a position of raising taxes on the American people, using that to help mitigate the carbon emissions in the atmosphere, and not using that money to do that, would you not say that that is being dishonest to the citizens of this country?

Mr. WARA. Well, I think the important thing to recognize is that a carbon tax, the point of a carbon tax is to sometimes raise the cost of emitting greenhouse gases, and that is accomplishing its objective. What you do with the money, whether you rebate it to consumers or to citizens or use it on other initiatives is a question of how you want to distribute the cost of the program across society. The same thing is true of a cap and trade, however. Depending on how you choose to distribute allowances, you can significantly impact the distributive effects of a climate policy program to make it actually progressive rather than regressive.

Mr. SHIMKUS. Anybody else?

Mr. EIZENSTAT. Yes, Congressman.

My view is that under a cap-and-trade program, with the revenues that are mentioned in the President's budget, that the overwhelming majority of that should be rebated back to industry and to consumers so that you offset the additional——

Mr. SHIMKUS. And I would agree. I would go further. I would say not the overwhelming, I would say all. I would say all. And hopefully some of that overwhelming will address the cost per individual.

We have this great debate—and I will close with this Mr. Chairman, I see my time is short—95 percent of Americans got a tax cut. Whoo-hoo, $400 a year. Cap-and-trade evaluation costs $700 a year. So maybe that additional $300 will go to mitigate the increased cost to the individual. That is not a break even based upon this tax relief. But I would pose a question that if the revenue is not to mitigate climate, then we are just going down another failed experience of the nuclear waste fund.

I yield back.

Mr. MARKEY. The gentleman's time has expired.

The Chair recognizes the gentleman from Georgia, Mr. Barrow.

Mr. BARROW. Thank you, Mr. Chairman.

Ambassador, I have to say, you don't know this, but you are sort of a hero of mine. I have been watching you for a long time from something of a distance. The first time we met was the last time we met. It was at the Democratic National Convention in New York in 1976 when you were transitioning the incoming administration of then President-elect or soon to be President-elect Jimmy Carter.

You have got a great client at this hearing, and I know they got a great lawyer.

I want to ask you to kind of trade places with me and try to represent my client in this offset debate a little bit and try and help me understand what is in it for the folks in Georgia. Here is the impression I get from reading the testimony, from hearing the statements. And my understanding so far, and this is a case that is most powerfully made by you, it seems to me and the way I would state it is, not getting developing countries to go down the road, to go down the trail that our forefathers blazed when they cleared this continent, gives us a whole lot more bang for our offset buck, does a whole lot more good, easiest to do and— you know, easiest to monitor, easiest to verify, easiest to measure, easiest to avoid leakage. All these things seem to point in the direction of your client, the goal, the interest that you serve playing a very large role in this.

By contrast, I represent a lot of folks in a part of the country where things like RPS are going to result in a whole lot of money being paid, if not by taxpayers then by rate payers, who are very much the same group of people I might add, going to other parts of the country. And I want to know what is in it for us? What is the most robust role an offset program can play for intensely farmed areas, intensely worked land, like Georgia, where we have a small amount of things like renewables that we can build on a renewable portfolio standard? What is in it for us? If you fly over Georgia, you will see that all our forested land is laid out in nice

neat little rows. What looks like forests are really just stands of crops to be harvested. They are planted to be cut. So what is in it for Georgia? What can we get out of this?

Mr. EIZENSTAT. First of all, good land-use planning should also be rewarded in the legislation in terms of no-till farming and the like.

Number two, companies in your district and in districts throughout our State, the State that I grew up in, and yours, would have the same benefit as companies throughout the country. They are going to be under an obligation under a cap-and-trade bill to reduce their emissions. This affords them a less costly way of achieving their goal.

Mr. BARROW. But if I could speak for the skeptics caucus here amongst us. The leakage problems are the greatest. The measuring problems are the greatest. The verifiability problems are the greatest. What is the highest, what is the best outcome we are likely to get out of this as a practical matter given the relative complexity of our situation as opposed to the pristine simplicity of the interest you are trying to represent?

Mr. EIZENSTAT. Well, first of all, I don't believe there is a problem with verifiability, as I indicated. I think that the combination of establishing a national baseline, which should be required for a developing country, satellite telemetry, on-the-ground monitoring, all of those can assure that we have a verifiable credit that can be purchased by a company in your district to reduce the cost of their compliance. I believe firmly we are not going to be able to pass a piece of legislation that doesn't have effective cost reductions tied into it, so that it is a very effective way for companies in your district to be able to comply at a reduced cost.

Mr. BARROW. Well, that is usually important to me, so I want to pose my own yes-or-no question to other members of the panel. Is there anybody on the panel here who doubts that we can participate in Georgia every bit as much as they can any place else for an offset problem? What are the problems that would affect our land use in seventh-generation managed land, like my family has got in Oglethorpe County, Georgia, as opposed to not cutting down old-growth forests in far parts of the world?

Mr. GERO. I for one will say absolutely that Georgia and other parts of the United States, the vast majority of the United States, are probably going to benefit greatly by an offsets program because offsets apply in sectors that are not likely to be capped, and agriculture and forestry are not likely to be capped sectors.

Mr. BARROW. I got an impression one reason why it is not going to be capped is it is so hard to manage in the first place. It is so hard to establish. It is hard to bring in a cap program.

Mr. GERO. It is hard to regulate from an emissions reduction standpoint, but it is not hard necessarily to write good strong rules to ensure the project is additional, that it is verified, and that in fact the ownership is clear and permanent.

Mr. BARROW. Does everybody on the panel agree that it is essential that we be able to participate in this at home as well? That we be able to offset it right here and right now?

Ms. FIGDOR. I would say, not through an offset program, but you can achieve the conservation goals that you are discussing by cre-

ating a fund domestically to sequester to improve the sequestration of carbon in plants and soils. That fund would be created through auction revenue and would be a very important part of the solution of reducing—achieving the deep long-term reductions in emissions that the science shows are needed.

So I believe it is a very important part of the solution, but shouldn't be done through offsets, because then it is done at the expense of actually achieving with certainty the cuts in emissions that science shows are needed. This should be done in addition to the cuts from large sources, like power plants.

Mr. BARROW. Does anybody else on the panel have anything to offer that I can take back home?

Mr. STEPHENSON. I was just going to say that if you auction the credits under a cap-and-trade program, there is going to be revenue generation that could be used for incentives. That is a separate argument from whether offsets should be part of a cap-and-trade program or not.

Mr. MARTIN. The only comment I would add is, and I don't know the specifics of Georgia per se, but in Alberta, they have a greenhouse gas market, and one of the offset projects that they have is this no-till agriculture. So from an area that is also heavily farmed, that is one way of reducing emissions, and it seems to be working.

Mr. BARROW. Thank you.

Mr. Chairman, I yield back.

Mr. MARKEY. The gentleman's time has expired.

There are about three roll calls on the House floor right now. And I think we would be well advised just to take a brief recess until approximately 5 minutes past 12:00, at which point we will reconvene the hearing and recognize the members. So, with that, we will stand in recess.

[Recess.]

Mr. MARKEY. Ladies and gentlemen, thank you so much.

I think we are going to have clear sailing for a little bit of time out on the House floor. So, as a result, we can continue uninterrupted for a fairly good period.

Right now let me turn and recognize the gentleman from Virginia, Mr. Boucher, for his round of questions.

Mr. BOUCHER. Well, thank you very much, Mr. Chairman. And I want to compliment all of the witnesses on their superbly presented testimony here this morning.

Ambassador Eizenstat, if I may ask a couple of questions of you, you have strongly advocated for tropical forestry preservation. I agree with you that that should be an eligible subject of offsets. Do you see other international offset opportunities, or should we limit the eligibility just to tropical forest preservation?

Mr. EIZENSTAT. No, I don't think we should limit it at all. I think there may be other opportunities as well. My focus is on the forestry issue. But you can have methane capture. There are a whole host of other ways in which developing countries can reduce their greenhouse gas emissions, and they should be incentivized to do it.

I would also like to say, Mr. Chairman, that we focused almost entirely on the issue of forest carbon credits. But even in the forestry area, there are other things that we think should be in the bill. For example, market readiness, a dedicated funding stream,

that could be done by development assistance to support efforts to build capacity in developing countries, not only for forest but for methane capture and others, to develop their monitoring networks. Then we have talked about the credits as well. And the third is direct support for other forest carbon conservation actions, like actions against illegal logging, additional allowances within a domestic cap to address early action and things like that. So I think that forests are one area. Even within that area we should look at market readiness and conservation, but that there are other ways to get developing countries engaged in this. And we should see that as a step toward ultimately getting them to take a cap-and-trade.

Mr. BOUCHER. You have faulted the clean development mechanism that is an aspect of the European emissions trading system. Given the problems that have existed with that, what level of confidence should we take, that if we go beyond the readily verifiable tropical forestry eligibility, and we go into developing countries with things like methane capture and other types of credits, that we can have confidence in the verifiability of those offsets?

Mr. EIZENSTAT. That is a very good question. I mean, land-use practices are also something that is very important in developing countries. The COMESA Group is very much in favor of that. That can be monitored also by telemetry and on-the-ground monitoring.

The reason the CDM is not a good model, and I have to say I am somewhat surprised that the testimony from GAO would stress so much and then extrapolate that onto a very different system, it is a project-by-project system. It is not the kind of broadbased carbon market system that we are talking about. So I think that one can have a great deal of certitude. The CDM is bureaucratic. It has to be approved on a project-by-project basis by a bureaucracy. It hasn't approved one forest-based project at all. It is very flawed. It is really something we should be moving away from. So it is not a model at all for what I am talking about.

Mr. BOUCHER. OK. Thank you.

Mr. Martin, let me pose one question to you. Do you believe that Shell would have endorsed the blueprint put forward by USCAP and the targets and time frames for taking greenhouse gas emission reductions in the absence of that blueprint's availability of offsets, which as I understand it would be 1.5 billion domestic tons and 1.5 billion international tons annually?

Mr. MARTIN. Probably not. And the reason for that is that the kind of technologies that we are going to need in the longer term to hit some of these very aggressive targets, like capture carbon sequestration, just aren't available yet. And the costs of those initial projects are going to be much higher than the next 10 and the 10 after that. So, really, the abilities to use offsets is that bridge mechanism to allow us to put more funds into some of the technologies that we know we are going to require in the future.

Mr. BOUCHER. And so by allowing offsets, we provide a space and time for technology to catch up.

Mr. MARTIN. Absolutely.

Mr. BOUCHER. And so your believe is Shell would not have endorsed the USCAP targets and time frames in the absence of the offsets.

Mr. MARTIN. I can't categorically say no, but that is my view, yes.

Mr. BOUCHER. OK. Thank you.

Thank you, Mr. Chairman.

Mr. MARKEY. The Chair recognizes the gentleman from Louisiana, Mr. Scalise.

Mr. SCALISE. Thank you, Mr. Chairman.

There is a statement that the National Alliance of Forest Owners wanted to submit for the record. If I could have that submitted into the record?

Mr. MARKEY. Without objection it will be included in the record.

[The information was unavailable at the time of printing.]

Mr. SCALISE. Thank you.

Mr. Stephenson, the statements I think in your presentation you talked about the complications of, what is an offset? Is it a tangible good? If you could describe to me how you really determine what an offset is.

Mr. STEPHENSON. I don't know how best to answer that. It is being treated as a tangible good if you use it in a marked-based system. However, the problems in estimating what occurs in the future versus what have occurred under a normal business scenario is where it creates uncertainty and risk.

Mr. SCALISE. Have you all seen that there are various definitions and maybe varying definitions that could create completely different interpretations on what somebody actually is buying?

Mr. STEPHENSON. Certainly in the voluntary market in the U.S., there are a number of different verification schemes and estimating schemes. The reason the ETS didn't approve forestry projects and agriculture projects was because it is inherently difficult to estimate what you are getting for that. So in deference to what the Ambassador said, we think that is a high-risk proposition.

Mr. SCALISE. Are some offsets more credible than others?

Mr. STEPHENSON. Yes. Certainly methane capture from landfills is fairly easy to measure. But, again, you have the problem of additionality. If a landfill may want to capture methane anyway because the market value is going up for gas in the broader use of methane, the more economic incentive a landfill would have for doing that anyway, without an offset program.

Mr. SCALISE. Are there any estimates on how much we would be sending overseas to purchase international offsets?

Mr. STEPHENSON. We really haven't looked at that.

Mr. SCALISE. I don't know if anybody else on the panel can address the question of international offsets.

Mr. EIZENSTAT. Yes. The International Offset Program, Congressman Scalise, would not be sending U.S. taxpayer money abroad; although there may be some foreign assistance to help with capacity building. This would be private-sector money, a decision by a U.S. company, which it wouldn't be required to do, that it would like to meet part, not all, of its obligation to reduce emissions by purchasing an international credit from abroad. That credit certainly has to be verifiable and so forth. But that is a private-sector decision using private money.

Mr. SCALISE. Dr. Wara, you talked about some of the problems or experiences that China—I think China has gotten a significant

amount of money from the European Community on offsets. I think $6 billion was a number I had seen. Can you describe what they did get and for what did they get it for?

Mr. WARA. Well, the credits issued by the CDM to date are mostly from these industrial gas projects that I talked about earlier where costs of reduction are very low relative to the current, even the current market prices for CDM credits, which have fallen considerably because of the crash and the EU emissions trading scheme market and costs by the recession. But those projects actually, I think, are additional in the sense that they would not have happened but for the CDM.

On the other hand, when one steps back from the current mechanism and says, are there more cost effective ways to address industrial gases in particular, I think the answer has to be yes. And the model that has worked very well under the Montreal Protocol to limit emissions of those undepleting substances in developing countries could be applied very effectively in this context. And in fact, there are discussions within the Montreal Protocol context of revising that treaty to include some of these gases, so that might be possible.

Mr. SCALISE. Now, what is there to tell us that Europe wasn't paying China to do things that China was already going to do to build nuclear plants, which they are doing anyway?

Mr. WARA. So, I think that issue is a big one in the energy sector. And moving forward, one lesson from the early experience with CDM is that big projects tend to be more successful than small projects because they more easily overcome transaction costs in the system which are high. So in the energy sector in China, particularly with the construction of natural-gas-fired power plants, which essentially all gained registration under the CDM, which is the precursor to getting credits issued, I think there are real questions about whether those plants would have been built anyway. And in that context, I think Europe is paying for things that would have happened anyway because they are in the interests, in China's energy security and national security interests.

Mr. SCALISE. Thank you.

Mr. MARKEY. The gentleman's time is expired.

The Chair recognizes the gentleman from Washington State, Mr. Inslee.

Mr. INSLEE. Excuse me if some of you have gone through this exercise before, but we have to do this at every hearing it seems, which is to compare the cost of the status quo, which is inaction and continued climatic change and all it portends, with the cost of action, which is curtailing CO_2 emissions. You were asked a question by Mr. Shimkus about the costs associated with this. Many of us, including Lord Stern, who has done the most authoritative research on this, have concluded that the cost of inaction will greatly exceed by a factor of five the cost of action associated with a well designed CO_2 emissions plan globally. I think he put the figure of 5 percent reduction of GDP if we do not act on this.

It is my belief that a well-crafted plan will actually cost less in comparison to the costs associated with inaction with the damages to the U.S. economy associated with that. I will just go down the row and ask if people agree or disagree or have no opinion on that.

Doctor.

Mr. WARA. Agree.

Mr. EIZENSTAT. 100 percent agree.

Mr. MARTIN. Agree.

Ms. FIGDOR. Strongly agree.

Mr. GERO. Absolutely agree.

Mr. STEPHENSON. I agree. In fact, the re-insurers in the insurance market in climate change have already recognized the value of inaction in their premiums that they charge.

Mr. INSLEE. So let me say that those who are opposed, this is just one congressman talking for a moment, those who will make the most noise saying that this program is going to cost the U.S. economy, will cost five times more than those of us who want to engage in action. That is a bold statement. I think it can be backed up. The shoe will be on the other foot during this debate, and so let the discussion begin.

I want to ask about the general idea of offsets in a forest setting. My take on this is that the only way to really have a long-term credible program is to make sure we get additionality in saving forests. And the only way to do that is to have a national nation-by-nation program to assure that when we buy forestation, we in fact get more forestation in the Nation, not just the individual plot of land. The reason is that, if we buy a plot of land, we buy a lifetime easement or a permanent easement, and the next-door neighbor just clearcuts his land, you haven't got anything for your money.

So, Ambassador Eizenstat, I read your testimony. I didn't get to hear it, but I read your testimony, and I sort of understand you saying we need to start into that process, but we can start before we have those in place. Could you elaborate on that?

Mr. EIZENSTAT. Yes, sir. We should not look at the different modes of dealing with avoided deforestation and cutting forests as oppositional to each other. We, for example, can have set-asides. We can have foreign assistance that can prepare countries to develop their monitoring systems. We can have the forest credits that we have been talking about internationally, and consider all of those together, not an either/or. We will need all of those.

Second, I want to emphasize very strongly, these are highly verifiable. The Eliasch report that just came out from the UK said it is easier to verify forest carbons emissions than it is other emissions. And the reason is the combination of satellite telemetry, which is now highly developed, being used by Brazil—NASA and Cisco just announced this week a joint venture on that, you have got Google and others who really have that capacity. You combine that with on-the-ground monitoring and a national baseline; you allow a set-aside. So you say, we are not going include 100 percent of forest. Let us take into account there may be a fire. There may be policy changes, and you bank that, bank it and insure it, so that if there is a problem you have got a safety valve involved as well. You combine all of that, and you have got a highly verifiable system. We need to start on that immediately and we can start on it again by market readiness, by ODA, by set asides. All of those things are necessary in addition to the carbon credits working together to provide an incentive not to cut the forests. And again, I really feel so strongly about this because we are cutting these for-

ests down, Mr. Inslee, at the rate of one football field a second. Once these forests are gone, they are gone forever. The habitats are gone. The people who depend on them, the rural poor in these developing countries, will have to migrate. We will start a terrible cycle.

Mr. INSLEE. Thank you.

Mr. MARKEY. The gentleman's time is expired.

I know, Mr. Eizenstat, you wanted to add one more thought.

Mr. EIZENSTAT. I am sorry to the committee. I have to leave, and I appreciate—I wanted to make a couple of points. The first is the point I was just making to Mr. Inslee. We should not look at these things as being whether you are for foreign assistance, whether you are for set-asides, whether you are for carbon markets. The amount of money that needs to be aggregated, private-sector money, that needs to be aggregated to provide the incentive for countries that have every incentive to cut these forests is enormous. So we should be looking at all combined as a way of doing it.

Second, these credits would only be provided after performance is demonstrated, not before. They have to demonstrate over a period of years that they are not cutting their forests down. Only then do they get their credits. And again, we can use insurance schemes, set-asides, banking of credits and zones in the forest to make sure that if they slide back, that they pay a price for it. All of these together are necessary.

And then last, on the EU. The EU, Mr. Stephenson, I can tell you from experience having been ambassador there, having been at Kyoto, they don't believe in market mechanisms, period. And that is one of the problems they had with forestry credits. They just don't. Now, they are coming around to it because their industries are also saying we can't afford this 20–20–20 target unless we have offsets, so they are moving. But there just is a mentality against market mechanism that, thankfully, we don't have in this country.

Mr. MARKEY. Thank you, Mr. Eizenstat.

And we thank all of you for your excellent testimony today. It is going to be very helpful to us in the formulation of the draft legislation which we are putting together right now and towards the goal of passing legislation by Memorial Day. We thank you all.

This hearing is adjourned.

[Whereupon, at 12:35 p.m., the subcommittee was adjourned.]

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