
GROWING JOBS IN RURAL AMERICA

HEARING

BEFORE THE

COMMITTEE ON AGRICULTURE, NUTRITION AND FORESTRY

UNITED STATES SENATE

ONE HUNDRED TWELFTH CONGRESS

FIRST SESSION

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GROWING JOBS IN RURAL AMERICA

Thursday, July 14, 2011

UNITED STATES SENATE,
COMMITTEE ON AGRICULTURE, NUTRITION AND FORESTRY,
Washington, DC

The committee met, pursuant to notice, at 9:33 a.m., in Room G-50, Dirksen Senate Office Building, Hon. Debbie Stabenow, Chairwoman of the committee, presiding.

Present or submitting a statement: Senators Stabenow, Brown, Casey, Klobuchar, Bennet, Lugar, and Thune.

**STATEMENT OF HON. DEBBIE STABENOW, U.S. SENATOR
FROM THE STATE OF MICHIGAN, CHAIRWOMAN, COM-
MITTEE ON AGRICULTURE, NUTRITION AND FORESTRY**

Chairwoman STABENOW. Well, good morning and thank you for being here at the Senate Committee on Agriculture, Nutrition, and Forestry. We will call the meeting to order.

This is a day of multiple things happening at the same time, so we welcome all of our witnesses and hope you will understand as people are trying to be two or three places at once. Senator Roberts this morning is not able to join us, but welcomes you, as well, and we are very, very pleased to have Senator Lugar here as a great leader on these issues that we are talking about today. So we thank you for being here and being a part of this. At some point, I, as well, have a bill up in the Energy Committee that is going to be voted on and I am going to be running up and down between here and third floor in Dirksen at some point, so if I leave, it is not because of something you said. It is because I need to attempt to be two places at once myself this morning.

But again, welcome. Today's hearing will focus on ways to grow jobs in rural America, and certainly we know the farm bill is a jobs bill and there are other ways in which we can leverage what we do, the strength of rural America to create jobs, and that is really what we are all about in this committee. There are 16 million Americans who have a job because of agriculture and there is even more that we can do. Even as we look at the challenges of the last decade, certainly in my State, agriculture continued to grow, and this is a very, very important part of our economy. Manufacturing accounts for roughly a quarter of rural private sector earnings and accounts for more than one in ten rural jobs, as well.

I have a unique perspective as Chair of the Agriculture Committee, because in Michigan, as I always say, we grow things and make things, and you have an economy, I believe— we have a middle class in this country because we grow things and make things.

Agriculture and manufacturing are at the heart of any economy. They created the U.S. middle class and really are the life blood of rural America.

All across Michigan, all across America, we have people in rural communities working to create jobs and compete just like people in every city in America. Today, we are highlighting some of the great work that is being done, promising opportunities to grow jobs in both agriculture and manufacturing sectors around the country.

First, we will consider the possibility of developing a Rural Energy Savings Program which will enable the Rural Electric Co-Ops to assist their customers in making energy efficiency improvements to their homes and their businesses. Senator Lugar has included a similar provision in his practical energy plan, and I understand he continues to work on a stand-alone proposal with Senator Merkley and we, again, thank you for your leadership.

Further, I know that several other members of the committee expressed an interest in this concept last year when we had a subcommittee hearing to examine legislation at that time which Senator Merkley had introduced. This type of program is important because rural residents are more likely to live in older, less efficient, energy efficient homes and the USDA has found that our rural residents spend as much as \$400 more a year on energy costs than those living in our cities.

A rural energy savings program would not only lower energy costs for families, for farmers, for small businesses, but it would create opportunities for companies that manufacture energy efficient installation, heating and cooling systems, doors, windows, et cetera. So it is really about jobs.

Our second panel will examine the link between agriculture and manufacturing in the rapidly expanding sector of bio-based products. We tend to think of America's dependence on foreign oil only in terms of the gas pump, but we also rely on imported petroleum for plastics, foams, and other materials that we use every day. For years, our best minds have been working to develop bio-based alternatives to those petroleum products.

One of the foremost pioneers in this area was none other than Henry Ford, who experimented with ways that soy-based products could be used in automotive production. Today, we have cars rolling down assembly lines across America being built with parts being made from agricultural products—seats, interior panels, arm rests, sunshades, to soy wire coatings, carpets, and structural foam.

In Michigan alone, we have over 80 companies manufacturing bio-based products and even more using bio-based materials in their products, and these products are not just for cars, as I said. They are cleaning products, soaps, insulation, plastics, foam products, and fabrics. At today's hearing, we will hear about a number of these exciting new opportunities to connect production agriculture with rural manufacturing, creating jobs and prosperity in our Main Street communities in rural America.

So I am very pleased again to have my friend, Senator Lugar, here and would ask him for his opening remarks.

**STATEMENT OF HON. RICHARD G. LUGAR, U.S. SENATOR
FROM THE STATE OF INDIANA**

Senator LUGAR. Well, thank you very much, Madam Chairman. I appreciate you convening this hearing today and for the opportunity to discuss the big opportunities we all have for job creation for Hoosiers and for all other States, for that matter, to save money through rural energy savings.

Rural energy efficiency has broad bipartisan support. Senator Merkley is a leader on this legislation. We also appreciate the partnerships of Senator Shaheen and Graham. Today's hearing gives us an opportunity to gather more views before we formally introduce and mark up the Rural Energy Savings Program proposal within this committee.

I join the Chair in welcoming all of our witnesses, and in particular Bruce Graham of the Indiana Statewide Association of Rural Electric Cooperatives. The Rural Electric Co-Ops in Indiana not only provide essential services for our homes, farms, and small businesses they also invest heavily in rural community activities across the State. They are pioneering efficiency work and investment in new forms of power generation that will save Hoosiers money. Bruce has served as the Chief Executive Officer for the 39 member cooperative association for nearly five years and I thank him for his leadership in Indiana and for joining us today.

Energy efficiency is gaining ground, from utilization of digital thermostats and better lighting at Warren Township schools in Indianapolis to energy savings contracts pioneered by Vectren Corporation Energy Systems Group in Newburgh. The potential savings from accelerating this trend can be a tremendous windfall for Hoosiers and all American families and small businesses. For example, a 2009 study by McKinsey and Company found that the end use energy efficiency measures using technologies already available can save us \$1.2 trillion by the year 2020.

Progress on energy efficiency is a particular need, an opportunity for our rural communities. More than 42 million Americans live in rural communities, and many of these Americans reside in homes that are significantly less efficient than those typically found in urban circumstances. In fact, the USDA has found that rural households spend \$200 to \$400 more, as you pointed out, Madam Chairman, per year on their utility bills than comparable urban households. This utility bill disparity is significant, especially given that rural households earn \$10,000 less per year than the national average.

The Rural Energy Savings Program proposal would permit rural families, farms, and other small businesses to receive low-interest loans to improve the energy efficiency of their properties. Opportunities for savings are abundant. A consumer might install better insulation, such as that manufactured in Shelbyville by Knauf, or replace drafty doors with a more energy efficiency variety like those made by Therma-Tru Doors, manufactured in Butler. Those are just two examples of the many Hoosier businesses that today manufacture innovative and affordable energy efficiency products. Not only will consumers save money, but more Hoosiers will be put to work to manufacture and install these efficiency upgrades.

By providing loans, the proposal offers a fiscally responsible path toward energy savings. Loans would be issued through USDA's Rural Utility Service to qualified local entities, primarily nonprofit rural cooperatives, who would then issue loans to consumers to meet local needs. Loans issued under this program would be repaid within ten years through money saved on utility bills. The Rural Energy Savings Program proposal is projected to create nearly 26,000 jobs, spur retrofits in up to 1.6 million rural homes, save rural households hundreds of dollars a year after the loan is repaid, and eliminate the need for new generating capacity to power 625,000 homes in our country.

Madam Chairman, my recently introduced Practical Energy Plan, S. 1321, includes the Rural Energy Savings Program proposal we are discussing today. The broader bill will save Americans \$33 billion each year in savings through energy efficiency and reduce the need for foreign oil by more than six million barrels per day by the year 2030, or well over half of our current imports.

The costs of the proposals are fully offset, and with substantially increased Federal revenues through more oil production. In writing my bill, I focused on energy policies that are achievable, cost effective, and most importantly, that have American consumers saving money and businesses saving money. I appreciate very much the Agriculture Committee doing its part to take up this energy saving for all Americans.

I thank the Chair.

Chairwoman STABENOW. Thank you very much, Senator Lugar.

We would ask our first panel to come to the table and we will introduce them. Welcome. I ask you to come and take a seat. We are very pleased to have each of you with us.

Let me go ahead first and introduce our first panelist, Mr. Bruce Graham. Mr. Graham is the Chief Executive Officer, Indiana State-wide Association of Rural Electric Cooperatives based in Indianapolis, Indiana, so I am sure that Senator Lugar may want to say hello, as well. Prior to his current appointment, Mr. Graham worked for the Kansas Electric Power Cooperative as the Vice President of Member Services and External Affairs. So we are very pleased to have you with us.

Our next panelist is Mr. Zac Stewart, and he will be introduced by his home State Senator—and I just want to note, Senator Bennet, this is at least two weeks in a row we have had people from Colorado with us, so I think you are getting more than your fair share of bragging about Colorado.

Senator BENNET. Well, I was going to mention that, Madam Chair. This is a record for us. I think we had three panelists two weeks ago and two panelists this week, so thank you for recognizing the incorporable talent from the State of Colorado.

Chairwoman STABENOW. Great. Well, we appreciate very much having Mr. Zac Stewart with us, the owner of Ambient, LLC, a building performance company in Durango, Colorado, that provides energy services, consulting, and construction, and I understand you have been in the energy efficiency field for 16 years and have a very impressive background, so we welcome you.

Also, Senator Bennet, I understand that our next witness, Mr. Paul Bony, who is actually from Oklahoma City, or your business

is in Oklahoma City, but you also live in Colorado, so you are certainly welcome to make a comment on that, although I think you are running up against your limit on people from Colorado.

**STATEMENT OF HON. MICHAEL F. BENNET, U.S. SENATOR
FROM THE STATE OF COLORADO**

Senator BENNET. Well, thank you, Madam Chair. If I could say, first, how much I appreciate your holding this hearing, and, Senator Lugar, your leadership on this issue has made a huge difference, as well. And if I could spend two seconds introducing the witnesses from Colorado, and then I want to apologize to them because I have got a Banking Committee hearing and Chairman Bernanke is testifying and you may have noticed that things are not going so well on that score, so I am going to have to go to that, but—

Chairwoman STABENOW. That is because he is not from Colorado.

Senator BENNET. That is right. I will try to come back.

But I do want to say that we are happy to have Zac Stewart here, who is from Ignacio, Colorado, the home of Senator Ben Nighthorse Campbell, the beautiful Four Corners region of our State. Mr. Stewart is a native of nearby Durango and a graduate of Fort Lewis College. He has got broad experience working on these issues in State government agencies, both in Arizona's Department of Commerce and the Governor of Colorado's Energy Office. And as you mentioned, Madam Chair, he has recently started his own building performance company, Ambien, LLC, and we look forward to hearing of the work that Ambien is doing.

Following Mr. Stewart, the committee will hear from Paul Bony, who is the Residential Market Developer for a company called ClimateMaster. ClimateMaster is the world's largest manufacturer of geothermal heat pumps, headquartered in Oklahoma City. However, while working for an Oklahoma company, I understand Mr. Bony has the distinct privilege of living in Montrose, Colorado, where he has worked on geothermal heat pump issues in several capacities over the years, including innovative financing efforts with the Delta-Montrose Electric Association, his local electric cooperative. Mr. Bony's energy efficiency and renewable energy market development efforts have earned the Association of Energy Services Professionals' Achievement in Energy Services Award, the U.S. EPA's Excellence in Energy Star Outreach Award, and recognition from the Alliance to Save Energy.

So thank you, both of you, for coming here. You need to represent us well because next week we will have another hearing and we want to have at least two more Coloradans here, so let us not break our record.

[Laughter.]

Senator BENNET. Thank you, Madam Chair.

Chairwoman STABENOW. Thank you very much.

Our final witness on the panel is Dr. Helen Sanders, and Senator Klobuchar would like to introduce her.

**STATEMENT OF HON. AMY KLOBUCHAR, U.S. SENATOR FROM
THE STATE OF MINNESOTA**

Senator KLOBUCHAR. Well, thank you very much, and I note, Senator Bennet, we have Dr. Sanders here from Minnesota. We also on our second panel have a witness, Marc Verbruggen, whose company is headquartered in Minnesota, but let us go on.

Dr. Helen Sanders is the Vice President of Technical Business Development at SAGE, based out of Faribault, Minnesota. She has been involved with SAGE since 1999 and has been involved with nearly all aspects of the manufacturing business. SAGE manufacturers windows that use innovative high-performance energy saving technology. They are really cool. I hope she describes them to you. It is really something, that can kind of change colors on a dime and is really an innovative technology.

She is a unique witness on the panel because SAGE is a producer of energy efficient products and is also working with Rural Electric Co-Ops to put in place new energy efficient technologies at manufacturing facilities to reduce their energy bill. So this is just a great example.

Our manufacturing is really on the upswing in Minnesota. I realized this back in January when I could start to visit all the companies on Saturdays because they were going 24/7 and we had one of our biggest export quarters of our State's history last quarter. Actually, I would add one good thing. Ag exports are up, Madam Chair, 22 percent in Minnesota. The whole rural area has really been holding our economy together, and SAGE is a great example from the manufacturing sector of how it can be done right. So I am pleased to have Dr. Sanders here.

I would also mention Mr. Verbruggen, who is the President of NatureWorks, and he is going to be testifying on the second panel. NatureWorks is headquartered in Minnetonka, Minnesota. It produces new bio-based products and is reinvesting in rural America, creating jobs. Mr. Verbruggen is going to testify about the exciting bio-based products at NatureWorks.

So thank you, both of you, for being here.

Chairwoman STABENOW. Thank you very much, and I understand that Senator Brown will have to be being two places at once this morning, as well, and that you did want to bring hello and introduce someone that will be on our second panel. Senator Brown.

**STATEMENT OF HON. SHERROD BROWN, U.S. SENATOR FROM
THE STATE OF OHIO**

Senator BROWN. Thanks, Madam Chair, and thanks for going out of the regular order. I preside over the Senate later this morning, so I cannot be here during the second panel, but wanted to welcome Dennis Hall from Columbus, Ohio. Dennis, whom I spoke with earlier today and walked over with, is a sixth generation farmer near Marysville, Ohio. His family many generations ago served as a stop on the Underground Railroad in northern and just outside of Columbus.

He is an Assistant Director of the Ohio BioProducts Innovation Center at Ohio State. Not only does he bring decades of experience as a farmer, he has been at Ohio State in the Extension Service as professor for ten years, working with students and educators.

And, Madam Chair, a couple of really brief comments in addition to introducing Dennis. Ohio is home to approximately 130 companies that use agricultural products to make new products—the agricultural crops to make new products, ranging from pet foods to bio-based paint to soy ink and toner, and the passion that Dennis brings to this, you will see in a few moments. To date, the Federal Government has provided minimal support to these efforts and I think this discussion today and beyond will help to form some partnerships that can work for all of us.

Mr. Hall, welcome. I appreciate that.

Chairwoman STABENOW. Thank you very much.

We will now turn to our witnesses, and Mr. Graham, welcome. We would ask each of our witnesses to take five minutes. We certainly want your written testimony, as well, but we would ask for you to give us five minutes of testimony, and then when we are finished, we will open it up for questions. Mr. Graham.

**STATEMENT OF BRUCE GRAHAM, CHIEF EXECUTIVE OFFICER,
INDIANA STATEWIDE ASSOCIATION OF RURAL ELECTRIC
COOPERATIVES, INC., INDIANAPOLIS, INDIANA**

Mr. GRAHAM. Thank you, Madam Chairwoman Stabenow and Senator Lugar and members of the committee. I appreciate the opportunity to express the views of the electric cooperatives on the Rural Energy Savings Program Act. It is a cost effective concept that can save energy and create jobs in rural America. It is an honor to be here before the committee.

As mentioned, I am Chief Executive Officer of the Indiana Electric Cooperative Association, which is the first Electric Cooperative Association in the country. Our 39 electric cooperatives and two GNTs provide safe and affordable energy to more than half-a-million homes and businesses and farms, and we continue to be leaders in making energy efficiency manageable for our consumer members in the State.

As also mentioned, I began my career with Kansas Electric Power Cooperative, and I mention that because as part of my responsibilities those 18 years, I managed our economic development, marketing, and our consumer efficiency programs at KEPCO.

Just as a reminder, the electric cooperatives are nonprofit member-owned utilities that were created to provide affordable and reliable electricity, not to make a profit for shareholders. We have for many years provided information and advice to consumers to help them manage their energy bills. This includes programs and incentives for their member owners to use electricity in an efficient and cost effective manner. The wide range of assistance includes rebates for energy efficient appliances, installation of efficient lighting, and rate incentives to encourage off-peak usage. In addition, in Indiana, Hoosier Energy successfully utilized the Federal stimulus program to weatherize more than 2,000 homes, giving us an important experience in consumer home improvement initiatives.

Just a couple of statistics from the electric cooperatives. As I said, we have been engaged in this for quite some time. In fact, 96 percent of the cooperatives in the country operate an efficiency program currently, and 70 percent of the cooperatives offer some kind of financial incentives already to promote efficiencies.

We believe that a RESPA program would be another tool that electric cooperatives can use to enable their member owners to maximize energy efficiency. The RESPA program authorizes an on-bill financing mechanism that allows co-op customers to borrow money from the cooperative for energy efficiency improvements at their homes and businesses and to pay back those loans through the monthly electric bill. This program was actually modeled in part on a successfully operating program developed by Midwest Energy in Hayes, Kansas, called House Smart.

The RESPA program design is simple. Cooperatives would be authorized to borrow no-interest funds from the Federal Government acting through the RUS at USDA and, in turn, make loans to their residential or business customers for the sole purpose of improving the energy efficiencies of those residences and businesses. No loan funds would be approved until an energy audit is performed, an application for funds is approved by the RUS, and the project is completed in accordance with the plans included in the application.

RESPA requires energy efficiency loans to have a pay-back period of no more than ten years. The savings to consumers related to the energy efficiency projects must be more than the amount of the loan. Customers will be able to repay the loan from those monthly energy savings through their electric bill. This rule means that energy efficiency projects that are not cost effective within a ten-year period will not be funded.

Consumer loans would only cover structural improvements, such as blocking air infiltration, insulation, HVAC systems, windows, and other improvements that co-ops can demonstrate will provide sufficient savings. Loans will not be used for appliances that do not stay with the structure, such as refrigerators, window air conditioner units, et cetera.

RESPA is designed to minimize the impact on the Federal budget because it is a loan program, not a grant program, and requires repayment of loans to the Federal Government.

The RESPA program will use the existing infrastructure at the RUS and the RUS loan protocols to evaluate loan applications, obligate funds, and advance them to electric cooperatives. Most cooperatives already have the billing capabilities and consumer relationships that will enable them to deliver and administer the loans to their consumers.

The program does have a jump-start loan component that enables co-ops to receive up to four percent of the loan amount in order to offset the up-front costs of initiating the program. Despite that, the loan funds provided by the government will not cover the entire cost of the program, so the individual cooperatives will likely still incur administrative costs. That being said, the program is voluntary and individual co-ops will be able to determine whether there is a need in their community that could be addressed with the funds from the RESPA program.

It is important, also, to remember that co-ops are ultimately responsible for paying back the loans from the RUS and not the individual consumers. Therefore, co-ops have a strong incentive to make careful evaluations of potential projects that make sure the member owners get the value they expect and they have the ability to repay the loan. Rural Electric Cooperatives have an extraor-

dinary track record of positive payment under the RUS and we look forward to continuing that trend using RESPA.

The Indiana Co-Ops and the National Rural Electric Cooperatives Association support the Rural Energy Savings Program Act because we believe there are co-op members across the country that would benefit from energy efficiency improvements on their homes and businesses and cannot afford the up-front investment in those improvements. The RESPA bill would benefit rural Indiana by making homes and businesses more comfortable and energy efficient. Importantly, RESPA also has the potential to create much-needed jobs in rural America for energy auditors, contractors, installation crews, and thousands of jobs to manufacture the new windows and doors, insulation, heating and cooling systems, and other energy saving improvements.

Chairwoman STABENOW. Mr. Graham, we would ask you to bring it to a close. Thank you.

Mr. GRAHAM. That is it. I thank you for the opportunity to be here this morning and that concludes my comments.

[The prepared statement of Mr. Graham can be found on page 44 in the appendix.]

Chairwoman STABENOW. Thank you. We very much appreciate your input and being here today.

Mr. Stewart.

**STATEMENT OF ZAC STEWART, OWNER, AMBIENT, LLC,
IGNACIO, COLORADO**

Mr. STEWART. Chairwoman Stabenow, Senator Lugar, Senator Bennet—he left—and distinguished members of the subcommittee, thank you for allowing me to speak today regarding the potential Rural Energy Savings Program and the possible impact on job creation in rural America.

I operate a small home energy retrofit business located in Southwest Colorado. We are a full-service home performance business, which means that we conduct the initial energy audit, generate a recommendations report based on potential energy savings, and then perform the repairs. So it is a one-stop shop for the homeowner. We install windows, insulation, other energy saving measures. I currently have three employees and all three, including myself, were previously employed in the residential home building industry prior to the downturn in the housing market.

We are experiencing a steady demand for energy efficiency repairs in my region, but face the same challenges most markets face, which is access to capital. For home performance programs to work, a funding mechanism must be in place to meet the needs of the homeowners who want and need repairs but lack the money to proceed.

In metropolitan areas, there are large national home performance contractors who have the capital to offer financing to homeowners. In rural areas like Southwest Colorado, we are made up of small businesses, small home performance contractors that do not have the ability to offer any financing options to customers.

Financing options, coupled with existing energy efficiency initiatives, is the piece that we are missing, especially in the rural areas, and I believe this would propel many homeowners to move forward

with repairs and, in turn, create more jobs for contractors like myself.

The housing stock in the Southwest in general, and I would venture to say in the rest of the nation, is weathered and aged. Home repairs usually only take place when there is a good year or the furnace stops working and there is no other choice but to fix it. There is no shortage of homes that need to have energy efficiency upgrades. As a home performance contractor, our greatest challenge is converting the audit into repairs. I can perform an energy audit and have the most talented salesperson around, but if the homeowner does not have the money to implement those repairs, there is no savings for anyone. An audit has no realized savings unless the repairs take place.

So I routinely encounter homeowners that are taking advantage of rebates that are available through the electric co-ops. However, they cannot proceed with any of the repairs because of funding issues. We are talking \$3,000, \$4,000, up to \$8,000 repairs that they would like to have done, but that is a big chunk to come out of their pocket at that point.

A rural energy savings program would benefit homeowners by making their homes safer, healthier, and more efficient, and it would definitely benefit rural contractors like myself by increasing our workload.

It is a perfect piece. When I sit down with a homeowner and have the leveraging opportunities, it is a perfect sales tool for a contractor like myself in that there are existing rebates for audits. There are existing Federal tax credits and now a potential for loans. I believe it would increase—go from a \$300 audit to a \$4,000 repair would no doubt create jobs.

Thank you. Thank you for your time. I appreciate it.

[The prepared statement of Mr. Stewart can be found on page 67 in the appendix.]

Chairwoman STABENOW. Thank you very much.

Mr. Bony, welcome.

STATEMENT OF PAUL BONY, DIRECTOR, RESIDENTIAL MARKET DEVELOPMENT, CLIMATEMASTER, OKLAHOMA CITY, OKLAHOMA

Mr. BONY. Thank you. Good morning, Chairwoman Stabenow, Senator Lugar, and distinguished members of the Senate. It is truly an honor and a pleasure to be here this morning to offer support for the Rural Energy Savings Program on behalf of my employer, ClimateMaster, which is based in Oklahoma. I was living in Colorado when they hired me and refused to leave, so I get on airplanes every week. ClimateMaster is based in Oklahoma, where our manufacturing facilities are, but we also have over 1,000 dealers and distributors across the United States, so our product goes into every State in the Union.

I have 25 years of electric utility experience focused on energy efficiency, renewable energy, and demand management. I have worked for two electric cooperatives, including the one where my great uncle was the first elected board president, and I am a member of the Delta-Montrose Electric Co-Op where I worked until I took this job. And thanks to the Fifth Army, I am a native Hoosier.

I have a degree in agriculture from Kansas State University. And I own a registered farm in Colorado, so I am a very bi-State kind of guy.

But based on my utility energy efficiency experience, this pending legislation will provide many benefits to electric cooperatives and the members they serve. This legislation will save energy. Buildings use nearly 40 percent of the primary energy consumed by this nation, with heating, cooling, and water heating consuming nearly one-half of that usage, and in rural homes it can be as much as 70 percent of the energy used.

Geothermal heat pumps, our product, can reduce this energy consumption by up to 50 percent. This legislation will save rural consumers money. Most rural areas do not have access to well-capitalized and organized energy efficiency retrofit companies. Rural areas also rely on a high proportion of expensive fossil fuels for heating and water heating. Customers can benefit greatly from energy efficiency upgrades, including geothermal heat pumps that provide energy bill reductions that can exceed the loan repayments under this proposed legislation.

I conducted an extensive home energy retrofit project at the Delta-Montrose Electric that confirmed that homeowners can easily reduce their annual energy usage by 50 percent or more from efficiency measures that provide a positive cash flow after debt service. In a survey ClimateMaster recently completed, 53 percent of our potential customers would have purchased our system if they could have obtained financing that would provide them a payment lower than their energy savings, giving them a positive cash flow.

Unfortunately, in today's tough economy, customers do not have ready access to affordable loan funds to implement energy efficiency measures. This legislation will be invaluable in breaking this financial barrier.

This legislation will also create jobs. The energy efficiency upgrades financed by this legislation will generate employment for local labor. For geothermal heat pumps, the installation of the equipment and ground loop has to be done locally. We will never import ground loops from offshore. I started an installation company that focused exclusively on the installation of 50 to 70 of our systems annually. This company employed seven full-time people in good paying jobs with full benefits. We also hired other contractors to provide services, including energy audits, drilling the ground loops, and weatherizing homes.

This legislation will improve the financial stability of the participating co-ops. Geothermal heat pumps offer cooperatives an excellent tool to obtain significant peak loads reduction and improve their system load factor. This allows a cooperative to provide energy efficiency to their members and reduce the need for expensive new generation without putting pressure on electric rates. These energy savings also provide four to ten metric tons of annual carbon savings per home.

Electric co-ops are a great vehicle to administer the RES program. They have a long track record of providing member-focused services and paying back their Federal loans. They are trusted by their members and they can collect payments on utility bills. And

in the rural communities, they are often the only organization with the resources and talent to administer this type of effort.

I recognized over 15 years ago that access to affordable financing was the key to customer participation in energy efficiency when I started a successful cooperative geothermal loop lease program that is still working today in California. In Colorado, I again proved that customers will respond to co-op financing to make efficiency investments. While individual members in my loan portfolio experienced the misfortunes that can happen to any of us, it always generated a positive cash flow, and I can also assure you that my general manager and our board of directors paid very close attention to my monthly reports on how that loan portfolio was performing.

However, in both programs, our ability to fund member efficiency was limited to internally generated funds, as the RUS was not able to finance these efforts. This legislation will close this large financing gap, and in my humble opinion, greatly accelerate the implementation of energy efficiency in co-op country.

In conclusion, ClimateMaster is very supportive of this legislation. I am convinced that it will provide great benefits to the millions of members of electric cooperatives. It closes the financing gap that has prevented the greater adoption of energy efficiency in rural America and it leverages the resources and talent embedded in America's electric co-ops.

Thank you for giving the opportunity to share my comments this morning.

[The prepared statement of Mr. Bony can be found on page 41 in the appendix.]

Chairwoman STABENOW. Thank you very much.

Dr. Sanders, welcome.

STATEMENT OF HELEN SANDERS, VICE PRESIDENT, TECHNICAL BUSINESS DEVELOPMENT, SAGE ELECTROCHROMICS, INC., FARIBAULT, MINNESOTA

Ms. SANDERS. Thank you. Chairman Stabenow and Senator Lugar and members of the committee, I really want to thank you very much for the opportunity to come testify here today on the role SAGE Electrochromics is playing in creating economic opportunity and strengthening the green economy in rural America. In her absence, I would like to thank Senator Klobuchar for her kind introduction to me earlier.

My name is Helen Sanders and I have a Doctorate from the University of Cambridge in surface science, and today I serve as the Vice President of Technical Business Development at SAGE Electrochromics, which is located in Faribault, Minnesota, in rural Rice County, where I have lived for the last 13 years.

I want to tell you a little bit about SAGE. We are actually creating glass for windows that go beyond your traditional idea of the window being just simply a piece of glass in the wall. What is unique about our glass is that it uses a technology called electrochromics, which allows it to be made highly tinted or highly transparent or any tint level in between at the touch of a button. So in this way, you can actually manage the amount of light and heat that comes into your building depending on the exterior environment or the needs or the occupants. So you kind of have like

a heat or light valve for your building. This reduces the load on the HVAC system and improves thermal and visual comfort for the occupants.

At SAGE, we like to think of the window now as an appliance that allows occupants to actively manage the amount of sunlight entering their building, and it allows occupants to keep out excessive heat and glare without resorting to the use of shades and blinds, which block the view to the outside. So you get to maintain that view and connection with the outside and let natural daylight in— which, of course, is the reason you put the window in in the first place.

SAGE is the world's leader in the commercialization of this technology for buildings, and we supply electrochromic glass for commercial, institutional, and residential windows. The electrochromic glass provides both daylighting and energy management solutions for a wide variety of buildings, for example, commercial offices, museums, religious buildings, high-tech buildings, colleges, and health care facilities, anywhere you need heat and light control.

And, in fact, Lawrence Berkeley National Laboratories found that by actively managing lighting and cooling, these smart windows could actually reduce peak electric demand loads by 20 to 30 percent in many commercial buildings, and potentially enhance the human comfort and productivity by maintaining that access to natural daylight and that view and connection with the outdoors.

The U.S. Department of Energy has determined that the use of electrochromic glass in windows can save up to 28 percent of energy in most climate zones through reduced air conditioning demand and increased use of natural daylighting. That makes it a huge part of the energy efficiency equation. And, in fact, what we call variable solar control that is provided by electrochromic glass is one of the key building envelope technologies cited on DOE's roadmap for achieving the zero energy commercial buildings goal in 2030.

Now, SAGE has actually advanced this technology to a point where we are actually expanding our manufacturing facility in Minnesota. We are constructing a 300,000 square foot facility, manufacturing plant, in Faribault and it has already created over 200 construction jobs and will create about 160 permanent green manufacturing jobs.

The project is in part financed by a loan guarantee from the Department of Energy, and Senator Klobuchar has been instrumental in helping secure that loan guarantee. Another element of our funding is coming from the local electric cooperative, which is funded through a USDA loan program which is similar to the RUS program under discussion here. And the USDA financing provides a valuable contribution to our project because it is supporting the cost of implementing energy efficiency enhancement in our factory, including the use of energy efficient lighting systems, dimmable lighting controls, which, when we combine that with the unusually large number of windows and skylights that we are putting into our manufacturing facility, is going to provide significant energy savings.

We are also doing a number of other—implementing a number of other energy efficiency measures in this factory, and as a result

of these and other energy savings, we project that our facility will be—the energy performance will be 28 percent better than the ASHRAE 90.1 baseline, which is the key national energy standards today. We are also going to be pursuing LEED certification for the building.

So we expect to make significant energy savings to lower our operational costs, and as a result, we will be able to make further investments in our facility. The faster that we can reduce the cost of our product, the faster that we can build adoption in the marketplace and then the faster that we will be able to grow our business, increase the number of jobs, and also the faster that the nation will be able to capture the significant energy savings potential both in new construction and also in renovations of the existing building stock and the faster we will be able to get to the goal of low energy or zero energy buildings.

I want to thank you very much for the opportunity that you have given me to testify today and I look forward to answering any questions you might have.

[The prepared statement of Mr. Sanders can be found on page 63 in the appendix.]

Senator LUGAR. [Presiding.] Thank you very much, Dr. Sanders.

The Chairman has asked me to preside momentarily as she takes care of another committee emergency and will reemerge soon.

Let me commence the questions to the panel by asking you, Mr. Graham. You have described the 39 co-ops that are a part of the co-op organization that you head. How many rural homes in Indiana, from your estimate, would be eligible for the program we are talking about today? What is the extent of the market, taking Indiana as a possible State for that?

Mr. GRAHAM. Well, I would hesitate to give you an actual number, but as some of the other testimony indicated, the challenges we have in rural Indiana and across rural America are oftentimes substandard housing. We found— Hoosier Energy in the program that they just completed found that easy market for 2,000 homes to weatherize in that program alone, really without turning over too many rocks to find those homes. I mean, there is a lot of interest in these programs, and that was just the Southern part of Indiana. It was very easy to find eligible projects for that.

I think there would be a great deal of interest. I do not know that I could tell you exactly how many, and, of course, that is going to depend upon how easy the rules are to comply with, how easy the program is to implement. The less red tape, the more aggressive our cooperatives can get with the program, and I think that is an important thing to remember.

Senator LUGAR. Mr. Stewart, just trying to think through how all this gets underway, let us say that there are thousands of rural houses that would be eligible, but why do you believe that homeowners in these houses are going to apply for the program? First of all, how will they ever find out there is such a program and call upon you or other panel members today to commence so-called audits of their situation, which I gather is an examination of the way that energy savings might occur in that particular dwelling. In other words, how do we get the momentum going, even if we make

estimates of how many houses there are and how much energy might be saved in America?

Mr. STEWART. Marketing.

Senator LUGAR. Yes.

Mr. STEWART. We have got to get out and hit the streets, and we are doing that. We are hitting it. And additional funding to market, the electric co-ops being able to send out flyers with the bill every month. I mean, there are definitely ways to get the word out, ways that I cannot do, fellow contractors like myself cannot do. The county that I live in is all served by an electrical co-op. Every county around the area is. They have a unique opportunity to get the word out to their members.

Senator LUGAR. So the co-op or the organization Statewide has to, through circulars or through some type of advertisement, make this knowledge available. Even at that point, there must surely have been a lot of homeowners for years who knew down deep they could probably have a more efficient situation but never got around to it or this was not so obvious in terms of savings that they thought about it, quite apart from how it would be financed. What is going to bring about, not a revolution in rural America, but at least an awakening so that significant percentages of people say, "Aha, this really is an opportunity for me. I would like to call somebody, a co-op or contractor, to get on with this."

Mr. STEWART. Well, as the prices of your utility goes up, I mean, that is going to sell itself. We battle with that every day. How do we get them on board? How do we convince this person that they need to have that happen? And it is really those case studies and their neighbors getting it done and getting into one neighborhood or area. Everybody is close knit, so if I can get into one house and then we can start rolling that around, then the word of mouth that I saved \$150 on my utility bill a month during the winter because of these things that happened, I believe that is going to benefit and it is—that is one way.

Senator LUGAR. Well, if somebody calls you and asks for an audit, how much would that cost? What would the cost of the audit be?

Mr. STEWART. It definitely depends on how extensive they want it to be, but they generally run from \$300 to \$500, based on the square foot. I mean, if it is a huge home, obviously, there is more time into the house.

Senator LUGAR. So the homeowner up front spends \$300 or \$500—

Mr. STEWART. Right.

Senator LUGAR. —to get the word as to what kind of changes—

Mr. STEWART. Right.

Senator LUGAR. —as the basis for the loan, then, that is taken.

Mr. STEWART. Absolutely. And I definitely—audits are a crucial point in this whole process and I really want to encourage any incentives for rebates on audits to be done only if they do select measures. If they do not choose to do anything, then they are going to have all their skin in the game, right, and pay for the whole audit. But when you can couple the incentives rebates from utility companies with actual measures being installed, I believe that is a very useful approach.

Senator LUGAR. Dr. Sanders, why would somebody come to you, even if you have these remarkable windows? How do people know of the 28 percent savings? Do you advertise this widely? Would it be likely that rural customers would say, I need those windows?

Ms. SANDERS. We do advertise. Mainly, you buy our glass through the standard window purchasing channels from some of the large wood and vinyl window manufacturers. Our testimony was primarily to look at the impact of the loans for small businesses in reducing our overhead and our operating costs and, therefore, being able to deliver our glass to customers at a lower cost. So the more that we can do that, the more accessible they are to the rural customers.

Senator LUGAR. But let us say an audit has been conducted by Mr. Stewart, so windows are a part of this situation. But how does this customer, who may not be sophisticated in terms of all the options, decide that he or she wants your windows?

Ms. SANDERS. I think it would, again, go back to marketing and the knowledge of the people doing the audit who are making recommendations about how—what is the best technology to be retrofit to solve their problem. I think it goes back to awareness with the people doing the audits.

Senator LUGAR. I appreciate your responses. I want to turn to my colleague now for his questions. Senator Casey.

**STATEMENT OF HON. ROBERT P. CASEY JR., U.S. SENATOR
FROM THE STATE OF PENNSYLVANIA**

Senator CASEY. Thank you, Senator Lugar.

I apologize to the panel for being late. I missed most of, except the very last part of Mr. Graham's testimony. I heard the other testimony after that. But I am grateful for the opportunity, and Mr. Chairman, I will submit my statement for the record as part of this hearing. I will not read a statement.

[The prepared statement of Senator Casey can be found on page 38 in the appendix.]

Senator LUGAR. It will be made a part of the record.

Senator CASEY. Thank you. I just wanted to ask a couple of basic questions about not just the topic that we are examining today, but also that topic within the context of what is happening here in Washington the last couple of days and certainly even over the last couple of weeks. There is an appropriate focus on deficit and debt, but all the time we are doing that, we seem to have lost our way or lost our focus on the question of job creation. So this hearing is particularly timely.

I wanted to ask if you had to answer—you are not required to have an answer to this, but I will try—if you had to answer the following question, how do we create jobs in rural America in the next 12 months, or let us say six months to 12 months, either in the context of this legislation or more broadly, because I know in Pennsylvania, we have got a State of approaching 13 million people. We are about between 12-and-a-half and 13, depending on what year you pick. Of those 12-and-a-half-plus million people, we have got at least three-and-a-half, if not more than that, who are living in so-called rural areas demographically. It is a huge rural population.

And when I go across our State and see the unemployment rates, invariably, the highest percentages have been in rural areas, small towns, communities, rural counties where most of the county is considered rural. Some of the economic trauma has been focused on a particular sector or industry. Dairy farmers, of course, have lived through hell, if I can say that in a very dramatic way. Some have just been suffering through what a lot of other communities are, whether they are rural or urban or suburban. It is access to capital. It is energy costs. It is a whole range of impediments to job creation.

So I would ask you, in the context of this legislation, and just based upon your own experience, you are in the trenches meeting budgets and creating jobs. What could we do here that would either have a direct impact on job creation in rural America or would be an incentive or a triggering mechanism to create jobs? And I am talking short-term. Maybe start with you, sir, Mr. Bony.

Mr. BONY. Yes, thank you, Senator. By the way, Pennsylvania is the largest State for our equipment, so thank you for that. You are our number one market.

Senator CASEY. I cannot take credit for that, but I will.

[Laughter.]

Mr. BONY. Well, you are tied for first with New York, so we appreciate that.

Senator CASEY. Thank you.

Mr. BONY. There is a precedent in the past, and it was the Rural Conservation Service, which was an energy audit program implemented in the Carter administration where utilities got to do energy audits, or actually—I hate to use the word—but were mandated to do energy audits for all of their members. The gas companies did the gas audits. The electric companies did propane and electric if it was the primary heating and cooling fuel. The flaw in RCS is the audits were mandatory, but there was no mechanism to get consumers to take action after the audit.

What is being proposed in this potential legislation is now the utilities could do the audits. They would have, at least in co-op country, they would have the financing available then to connect the consumers with the contractors and any implementable measure that had a positive cash flow, it is a lot easier purchase decision for a consumer when it is a turnkey package.

The other part of this bill that I do not want to be overlooked is the on-bill collection component, where the loan stays with the property through the electric meter or the gas meter. Now the consumer is not frozen up on, wait a minute, what happens if I want to sell? What happens if I have to move? The infrastructure investment stays with the meter so the consumer is not hung up on having the loan stay with them.

Those are very powerful tools that did not exist when we had the RCS audit program, and so if you could have the utilities—you could say, utilities, we want you to go audit these homes. We want you to offer on-bill financing. And we want you to train and aggregate your contractors, and there is—I live in the second-highest unemployment county in Colorado. We are rapidly pushing to be number one, and that is very unfortunate. Most of my friends who are in the construction industry—I flew home last week. The guy

who did my brick work was taking tickets at the airport to get out of the parking lot. That is very disconcerting to me.

So have the utilities do the audits. Have the financing available. The utilities can put the contractors together and use on-bill as the mechanism to make sure the consumers can fund anything that has a positive cash flow in that audit report and I think you can put people to work in a hurry.

Senator CASEY. Thank you. I know we may only have time for one other response, but either Mr. Stewart or Dr. Sanders? It is a jump ball.

Ms. SANDERS. I guess from a small business perspective, to drive job creation in small businesses we need to think about trying to reduce operating costs, and the extent to which you can provide the ability to implement energy efficiency measures will help drive down operating costs which will give, or improve cash flow and enable people to put the money to work in building their businesses and creating more jobs.

Senator CASEY. Thank you.

Chairwoman STABENOW. [Presiding.] Thank you very much, and I apologize for stepping out again to go to the Energy Committee, but we were successful there and I am now glad to be back.

So let me ask each of you, specifically around jobs, because I appreciate the discussion in terms of rural America, but when we are discussing the possibility of the Rural Energy Savings Program, some of you have touched on it, each of you in some way, but from the outside, I am not sure people really understand exactly what we mean or the broad array of which jobs can be created from something like this. So I wondered if each of you might talk about the fact that—what would happen if the program was available and walk me through the process that each of you would use from your positions to make improvements in a home or business and how this, in fact, would create jobs on the ground. What kind of jobs are we talking about? Mr. Graham.

Mr. GRAHAM. Certainly. The job opportunities are diverse for a program like this. From the electric cooperatives' perspective, we are going to—it is going to be in our best interest to have an energy auditor on staff, I think, because the cooperatives are ultimately responsible for repaying the loan, and so that would probably be an immediate job creation opportunity for the cooperatives.

We are going to have to—we would work with contractors that exist already, because you have heard about the important relationship we already have with contractors that exist. There would be a need to promote the program. There will probably be a need for somebody to track the costs of the program. There are going to be jobs that are created there.

But we can demonstrate in the project that we had for the stimulus program that the immediate jobs are going to be for the installation and the contractors. The program that Hoosier Energy went through, the contractor that did that work created 30 full-time jobs just to do that program. So that is just from the contractor's perspective. Then you had the wealth that is created by those jobs that has the downstream positive effect from all of those opportunities.

Chairwoman STABENOW. Mr. Stewart.

Mr. STEWART. At my level, I cannot install windows by myself. If the workload picks up, obviously, I have to hire people to do that. And what goes with that, obviously, is windows. I have to buy my windows. I have to go to Home Depot. That is the large supplier in the area. I mean, I have to buy those things. I have to hopefully hire another auditor and buy the equipment, the associated equipment that goes with it, the blower doors, the infrared cameras, whatever.

That is the jobs that I would be creating, in addition to administrative positions just within my company. And then subcontractors. I do not install furnaces myself, so I subcontract it out to a HVAC contractor.

Chairwoman STABENOW. So you are talking about actually purchasing equipment, which means other retailers, which means they have been getting equipment from the folks that make it. Then you are talking about hiring people to install it and so on.

Mr. STEWART. Absolutely.

Chairwoman STABENOW. Yes. Mr. Bony.

Mr. BONY. Thank you, Madam Chair. I did a program called the Home Energy Makeover Contest, which is now run nationwide by the Electric-Gas Industry Association, the first one being done in Colorado, another testament to our great State, I guess. We wanted to know how bad the homes were and we wanted to know how much employment it would take to put them in order.

We basically set out in our cooperative newsletter, if you think your bills are too high, let us know, and we looked up people's bills. We got several thousand folks who entered that contest. Now, that is on a meter base of about 40,000 total customers. So we had about a five percent response rate just to win this home energy makeover.

So then we had to go through the steps. The first was we needed to do the home audit, like Mr. Stewart's company would do. So a fellow showed up with the blower door and the thermal camera, and I even crawled in a few attics and basements myself just to see if it was as bad as I remembered, and it was worse.

[Laughter.]

Mr. BONY. The next step is then you have to fix all the stuff that does not done right, correctly—disconnected ductwork, adding insulation, taking windows out if they have totally failed, that kind of thing.

Then for the particular equipment that we represent, ground source heat pumps, somebody has to put the loop in, so that is either a fellow on a backhoe with a helper or two guys on a drill rig. We had to install the heating and air conditioning equipment. That is usually a two-man crew. There was always somebody in the back office to answer the phones and process the paperwork and do the purchasing. We hired other trades, which would include weatherization contractors, insulation blowers, electricians, carpenters, sheet rock workers if we had to tear out a wall.

And then upstream, with the job I do now, we had to buy products from manufacturers. They had to get those products on trucks. Those trucks had to go to distribution warehouses and they had to get it to the field.

So when you summarize all the folks that are involved, my personal math said five jobs per 100 homes that got a full workover. When I argue this with my friends, they say up to seven jobs per 100 homes, so the truth is probably somewhere in between that range.

Chairwoman STABENOW. Very good. Very interesting. Thank you. Dr. Sanders?

Ms. SANDERS. From SAGE's perspective, we would be able to implement energy efficiency technologies into our buildings, which would reduce our operating costs, and obviously the implementation of those energy efficiency measures would create jobs by virtue of the fact they need to be installed.

But on top of that, though, it is really as we reduce our manufacturing costs, it enables us to produce our product at lower cost and, therefore, offer it to the market at lower prices, which drives market adoption, which allows us to grow our business, which allows us to expand our manufacturing and hire more people. And it is like a virtual circle.

On top of that, one of the benefits of energy efficiency and developing more sustainable design in your building is that you get to have a more comfortable and more productive workplace, and that also enables us to attract and retain top talent, which is really important for us to remain competitive, especially in the global environment.

Chairwoman STABENOW. Thank you very much.

And in closing, let me just ask, Mr. Graham, could you talk just for a moment and elaborate a little bit more about the difference between the existing program and the proposal for a Rural Energy Savings Program.

Mr. GRAHAM. The existing program and—

Chairwoman STABENOW. What you have been doing and what the difference is, why it is good to have the kind of program that we are talking about.

Mr. GRAHAM. Well, the Rural Energy Savings—there are existing programs, but right now, they are few and far between. The value of this program would allow us to roll it out nationwide and there are a lot of efficiencies in that. Our national association or the government, if we create a model plan that everybody can adopt—there would be unique features to every State because every State has different needs weather-wise and improvement-wise—but if we create a wider range of program, then I think we have a much stronger success rate opportunity from this. So this is really kind of rolling it out nationally rather than leaving it to the individual cooperatives to initiate this program.

Chairwoman STABENOW. Great. Well, thank you very much for each of you coming today. This is an important discussion, certainly in terms of jobs, which is a major focus for us, as well as what we can do in terms of energy savings, and we look forward to continuing to work with you on this. Thank you.

I am going to ask our second panel to come forward. I apologize again that we continue to have people coming in and out, but it does not negate the interest in the topic by any means. We are actually very excited about the opportunity to expand upon the great work that is being done, both around energy efficiency but also

around bio-based products, and this is the beginning of that discussion as we look for ways that we can be supportive. Please come forward.

[Pause.]

Chairwoman STABENOW. Good morning. We are really pleased to have all of you here, and as I indicated, we expect colleagues coming back from other hearings to join us. We are very anxious to hear about the work that you are doing and how we might be supportive of that in partnership with you.

Let me first start with our first panelist and introduce Dr. Marc Verbruggen, who is the President and Chief Executive Officer of NatureWorks. Prior to this appointment with NatureWorks, he was the President of Toho Tenax America and we are very, very pleased to have you with us today.

Our next witness is Dr. Oliver Peoples. Dr. Peoples is the founder and Chief Scientific Officer for Metabolix, Incorporated, based in Cambridge, Massachusetts, and Dr. Peoples is a pioneer in the field of metabolic pathway engineering. He holds many patents related to genomics, including the first U.S. patent on the expression of PHA genes in crop plants, so we welcome you today.

Our third panelist is Mr. John McIntosh. Mr. McIntosh is the Vice President of Sales and Marketing for Signature Crypton Carpet in Dalton, Georgia, and most recently was instrumental in forming a partnership with the Yellowstone Park Foundation which recycles all of Yellowstone National Park's plastics, remaking them into Signature's carpet backings. We are pleased to have you with us.

Mr. Hall, who has already been introduced by Senator Brown, who we hope is going to be joining us, returning with us, as well, but we appreciate Mr. Dennis Hall, who is the Assistant Director of the Ohio BioProducts Innovation Center in Columbus, Ohio.

So welcome to all of you and we will start with Mr. Verbruggen first.

STATEMENT OF MARC VERBRUGGEN, PRESIDENT AND CHIEF EXECUTIVE OFFICER, NATUREWORKS LLC, WAYZATA, MINNESOTA

Mr. VERBRUGGEN. Thank you, Chairwoman. My name is Marc Verbruggen. I am the CEO of NatureWorks located in the home State of committee member Senator Klobuchar.

I would like to start with recognizing Senator Nelson. We have worked with Senator Nelson for a long time, even going back to the time when he was Governor. I also would like to thank Senator Johanns from Nebraska for all his great work he has done for us.

We have a large manufacturing plant in Blair, Nebraska, where today we directly employ about 100 people and are presently investing tens of millions of dollars expanding the existing capacity, all because of the large global growth we see for our product.

I would like to start out by talking about not the bio industry, but the regular chemical industry. Just some statistics. Between 1997 and 2003, the U.S. trade balance, if you think about chemicals, has plummeted from a \$20 billion surplus to a \$10 billion deficit. Over that same time period, the U.S. chemical industry lost about 100,000 jobs. If you wonder where those jobs went, you can

look at any statistic and see that the Middle East plastic industry is growing by about 20 percent per year.

In contrast, if you look at bio-polymers, according to a recent jobs report issued about bio, this committee could help create about 250,000 direct U.S. jobs in the sustainable chemistry sector, which could capture about 19 percent of an estimated \$1 trillion global bio-chemical market.

With that broad context, I would like to talk a couple minutes about NatureWorks. We were the first company to commercialize a broad range of bio-polymers derived 100 percent from renewable resources. We engineered and built the first ever large-scale bio-polymer plant with the required economies of scale to compete head to head with traditional plastics. Our proprietary PLA polymer, marketed under the Ingeo brand name, can today be found in a wide variety of applications. By the way, we were able to put some of them on the desk over there. You can look at rigid and flexible disposable packaging, wipes, diapers, and in a blended form, an increasing range of semi-durable products, such as gift cards, mobile phones, computer housing, and copier housing. Today, global brands and retailers such as Coke, Pepsi, Danone, Nestle-Purina, Toyota, Walmart, all have Ingeo products in their global portfolio.

Beyond NatureWorks, this Ingeo demand is creating jobs and spurring new product growth for our customers. Just to name a couple, we have large customers in Ohio, like Clear Lam and PolyOne, and a large customer in Michigan, Fabrikal. Actually, Fabrikal today is one of our largest global customers for our product.

NatureWorks is a typical representative of the broader bio-polymer industry in that it creates a number of benefits, a carbon footprint typically half of traditional plastics. And since our products are 100 percent based on renewable resources, we have abundantly available feedstock in the United States. And based on present feedstock economics, so today's oil price versus today's corn price, PLA can compete very well with disposable oil-based plastics such as polystyrene or PET while creating value for upstream farmers and downstream customers.

Just to put it in perspective, even during the global recession, NatureWorks grew about ten percent per year, and out of the global recession for the last two years, we have been growing by more than 30 percent year over year. Clearly, consumers around the world have been driving this demand for sustainable cost-effective plastics and global brands see the value in low-carbon product launches. Another piece of information is that we export more than 50 percent of our products outside the United States.

Because of time, in my written testimony, I gave seven different policy principles which could really help driving our business forward. Because of time, I will not go into them.

One thing to keep in mind, though, is that in a global economy, the importance of bio-plastics have now been understood globally, also. The U.S. today is by far the most efficient corn producer, which for us is our feedstock in Nebraska, but other feedstocks can also be used such as cane sugar or other starches. Therefore, other countries around the world are trying to get bio-plastic investment to their country to add value to their feedstocks and create jobs

over there. Just as an example, there is one Southeast Asian country who is now providing an incentive package containing a 15-year tax abatement for investors in the bio-plastics industry.

In the end, only the marketplace will decide which innovations will succeed. NatureWorks is a very firm believer that green plastics, which economics tied to renewable resources, will be one of the key growth drivers for the next decade, creating numerous green jobs tied to domestic feedstocks rather than imported oil.

Where the U.S. Government can help is to support innovation through competitively awarded research funds, but most important at this point, to redouble their efforts through tax legislation to attract the manufacturing base, because we are ready to manufacture. We are not a start-up. We are not an emerging technology. We are ready to manufacture today. Other countries know that, as well, so there is a competition going on. It is very important over the next five years that the U.S. positions itself well.

Thank you.

[The prepared statement of Mr. Verbruggen can be found on page 68 in the appendix.]

Chairwoman STABENOW. Thank you very much, and we want you making your items in America, no question about it, so thank you very much.

Dr. Peoples, welcome.

STATEMENT OF OLIVER P. PEOPLES, FOUNDER AND CHIEF SCIENTIFIC OFFICER, METABOLIX, INC., CAMBRIDGE, MASSACHUSETTS

Mr. PEOPLES. Well, thank you, Madam Chair, and thank you other distinguished members of the Senate.

The creation of long-term sustainable jobs in rural America is something I consider to be a personal mission. I have been very fortunate to come to this country many years ago and this country has been very, very good to me. I have also found the creation of jobs in rural America to be one of the most rewarding aspects of my career.

As a much younger scientist, I came to the U.S. from Scotland 27 years ago and I went to MIT in Cambridge, Massachusetts. One thing led to another and I was very fortunate to help found a new company with two of my colleagues. The company, Metabolix, will celebrate its 20th anniversary in June of next year.

This company was formed with what was then a revolutionary vision and mission: To use the emerging tools of genetic engineering to create a new chemicals and materials industry based on renewable agricultural resources. This was always going to be about rural development. This concept stemmed from a basic science project funded by the Office of Naval Research, and at the time, the terms "industrial," "biotechnology," and "synthetic biology" had not been coined. Oil prices were under \$20 a barrel. We were effectively pioneering in a very lonely way what is known today as the bio-based products and biochemicals industry.

In thinking about the message I wanted to convey to today's hearing, given that this is not really my forte, I came up with three with respect to jobs in rural America. Bio-based products and chemicals, as my colleague has said, has the potential to revitalize

U.S.-based manufacturing and create large numbers of sustainable jobs. Continued government investment in industrial biotech innovation and R&D providing value to agricultural feedstocks is also crucial to long-term sustainable job creation. The government can facilitate deployment of this emerging industry in the U.S. based on locally developed technology by creating demand, both through policy and also your purchasing power. You are a very large customer.

To get back to my story, with the help of a few visionary investors, we worked on the technology in our labs in Cambridge, Massachusetts with Federal support in the form of grants, as we watched the bio-pharmaceutical industry emerge around us. When I first came to the U.S., companies like Amgen, Genentech, et cetera, were very small start-up companies. Today, if you look at Cambridge, it has been completely transformed and we have tens of thousands of very high-paying, high-quality jobs based in biotechnology.

In Metabolix's case, given our focus, today we are pleased to see that our first production plant with a capacity of 50,000 tons per year of new bio-plastic is in operation with our partner, ADM, in Clinton, Iowa. The Clinton polymer plant has over 100 employees with future expansion plans to quadruple this. I believe there were over 500 construction jobs during its development.

Well, why Clinton, Iowa? Frankly, there is not too much corn in Massachusetts and ADM operates a very large corn wet mill in Clinton with enough infrastructure and sugar to supply future expanding demand. This speaks to a very fundamental advantage of rural areas in the emerging bio economy, which is the ability to supply the necessary feedstock for these new products and for new production facilities based on technological innovation.

Jobs will always move to the center of competitive advantage. That is why the oil and gas is moving to the Middle East. In the case of the U.S. Midwest, we have that feedstock. We have that foundation. What we need is to get that industry going.

The ADM polymer employees in Clinton are well trained, capable, and very hard working with a "can do" attitude so typical of rural America. Another plus in addition to having the feedstocks available for this new industry, we have the employment workforce ready to go.

A compelling feature of bio-based products is the downstream job multiplier effect. Based on this new bio-plastic, we have rejuvenated the plastics industry in Massachusetts, which is where, fondly enough, the plastics industry actually started before it started to move away. With our Telles Bioplastics Center headquartered in the revitalized industrial city of Lowell, a former big mill town, very big in basically the textile manufacturing before that migrated over the sea, as well. Telles is the name of the joint venture with ADM. So in this converted textile mill, we have 50 plastics scientists, engineers, and commercial staff working and processing applications and sales of Mirel Bioplastics. These jobs are further multiplied by end users or converters of the Mirel Bioplastics into products like bags, films, consumer goods, et cetera, et cetera.

Globally, as my colleague has said, bio-plastics are growing very rapidly, over 20 percent per year, with an almost unlimited upside

potential. The chemicals and plastics industries currently account for some ten percent of all petroleum used with the global production of plastics being around 500 billion pounds. The net value of this is around 400 billion pounds, if you focus on the lower value end. Simply put, replacing a barrel of oil making higher value-added bio-plastic products and chemicals is as effective at reducing dependence on imported oil as a gallon of bio-fuel.

The technical innovation developed in the U.S. to make bio-products is an opportunity for the U.S. to recapture its once dominant position in the plastics and chemicals markets. At its peak in the 1950s, the industry was responsible for over five million jobs and a \$20 billion positive trade balance. My colleague has addressed what has happened in the last decade.

So with respect to bio-based chemicals and plastics, they represent a historic opportunity to reverse these trends through the creation of a new generation of renewable, sustainable products developed and produced in the U.S. The U.S. and in particular rural America has a substantial competitive advantage in available arable land, advanced agriculture and infrastructure. We can couple this with leading innovative industrial biotech, an outstanding labor force, and excellence in manufacturing. In addition, we have the potential to use all of the infrastructure created for the existing petroleum industry to essentially take large volumes of bio-plastics to market. We basically have the makings of a very powerful bio-based products industry to revitalize manufacturing in this country.

Even in its early stages, the bio-based products industry accounts for several thousand direct jobs and likely tens of thousands economy-wide. Achieving the industry's full potential could create tens of thousands, bring jobs into the United States within the next five years, and the majority of these will be where the feedstock is, which is the rural areas. And when I say feedstock, it is not just corn. It is also trees. We have a very considerable forest industry in this country also in demise due to the lack of need for packaging, mainly because we have stopped making things to package.

As I stated earlier, Federal funding of innovative R&D is also crucial to maintaining and building on our advantages. The technology behind the success of the Mirel Bioplastics and the two other commercial platforms being developed by Metabolix was based in part in Federal funding. Using only the bio-plastics case, Metabolix translated less than \$5 million in Federal support into what is now over \$300 million in private investment in the business. Economic development impacts will include the creation of high-valued green jobs, improved trade balance, reduction of CO₂, and enhanced energy security through reduction of dependence on imported foreign oil.

Chairwoman STABENOW. I have to ask you, Dr. Peoples, if you could wrap up. Thank you.

Mr. PEOPLES. Thank you.

[The prepared statement of Mr. Peoples can be found on page 57 in the appendix.]

Chairwoman STABENOW. Thank you very much. We very much appreciate your testimony.

Mr. McIntosh?

**STATEMENT OF JOHN McINTOSH, VICE PRESIDENT OF SALES
AND MARKETING, SIGNATURE CRYPTON CARPET, DALTON,
GEORGIA**

Mr. McINTOSH. Thank you, Chairwoman Stabenow and the rest of the committee. It is an honor and we are very excited to share with you what we are doing in Northwest Georgia. On behalf of 1,100 employees of Textile Management Associates that include such brands as AstroTurf and SynLawn and Syntec, Universal Textiles Technology, and my company, Signature, we are excited to share with you how we are growing jobs by the utilization of bio-based products.

Eight years ago, the leadership of our company, led by Tom Peeples and Larry Mashburn and Doug Giles of UTT began the exploration of bio-based technology to replace existing petrochemicals that had been used in polyurethane carpet backings for some 30 years. Through their exploration, they were led to the United States Soybean New Uses Committee and a new and dynamic partnership was made with American farmers.

Through those efforts, the industry's first high-performance carpet backing, BioCel, was introduced and has become a standard in the specified commercial market sector as we know it. Today, BioCel can be found in some of the most prestigious installations across the U.S., including the U.S. Department of Agriculture and U.S. Patent Offices, walk-off matting systems that have just been installed at the Pentagon, landscape turf all across the country by SynLawn, AstroTurf athletic fields that are found in professional stadiums like the St. Louis Rams and also most recently in the University of Cincinnati baseball field, and two home runs in Kansas at the Kansas Jayhawks baseball fields and the K State Wildcat football field will now all be scoring on soy in the future.

All totaled, UTT and through its use of polyols extracted from American-grown soybeans have displaced literally millions of pounds of foreign-dependent petrochemicals each year. By depending on U.S. agriculture, we are depending on the U.S. chemists and chemistry. More importantly, the use of soy in our backing technologies has shown no increase in our cost, while in the manufacturing process improving performance resulting in a cost-neutral environmentally responsible solution for our customers.

This has driven great demand for our product over the last three to four years, and that is very important, because over that time in Northwest Georgia, our economy, like many of the manufacturing places across the country, have been hit hard through the economic downturns, with our unemployment rates hovering around 11 and 12 percent. Through these tough times, Textile Management Associates and UTT and our brands, by utilizing bio-based technologies, have actually been able to grow our workforce by some ten percent, and we are currently investing around \$3 million in creating our own plant to create our own polyols to expand into other markets, as well, continuing to lessen our industry's dependence upon foreign oils.

One of the things that I have learned is that success draws success and innovation draws innovation. The USB introduced us to an incredible gentleman, Jim Evanoff, who is an environmental protection specialist at Yellowstone National Park where he had a

little problem, where 43 tons of plastics were going overseas every year. This was not acceptable. We partnered with Yellowstone and Four Corners Recycling, CPE, in South Carolina and the USB to form a partnership where we now take all of these plastics back to Dalton, Georgia, and recycle them back into our products.

My company, Signature Crypton Carpet, was so inspired by this, we created an entire line devoted specifically to the inspiration of the natural order of nature in Yellowstone National Park. We formed a partnership with Aquafil, a yarn provider that is now providing us with nylon yarns that are 100 percent recycled content. Combined with the BioCel products, we now have the industry's leading 82 percent green by weight products. We have displaced 82 percent of either petrochemicals or virgin petrochemicals out of our products while increasing performance 30 percent.

We are proud that the first installation went into the Snow Lodge just two months ago with plastics out of the Park.

Having felt a need that the industry needs to adopt a more socially responsible position, as well, we partnered with the Foundation to say that 50 cents a square yard of every product sold out of that collection will go back into the Yellowstone Park Foundation that will help protect and preserve one of America's most pristine natural resources.

We firmly believe that if you always do what you have always done, that you are always going to get what you have always gotten. It takes great courage to create change. Our leadership changed 30 years of a mindset on how to make a petrochemical product and other new innovations inspired by such products like this will increase awareness, develop strategic partnerships, and we will take back our leadership in the world by doing well by doing good.

We thank you for this opportunity to share these stories with you and look forward to questions.

[The prepared statement of Mr. McIntosh can be found on page 55 in the appendix.]

Chairwoman STABENOW. Thank you very much for your terrific work.

Mr. Hall, welcome.

**STATEMENT OF DENNIS HALL, ASSISTANT DIRECTOR, OHIO
BIOPRODUCTS INNOVATION CENTER, COLUMBUS, OHIO**

Mr. HALL. Chairwoman Stabenow, members of the Senate Agriculture Committee, thank you for the opportunity to speak today. I would also like to especially thank Senator Sherrod Brown for inviting me and his very kind introduction. It is a privilege to come before you as a member of the Ohio State University, the Ohio BioProducts Innovation Center, and also as a farmer, to talk about the amazing potential of bio products and bio-based manufacturing.

My history is to have been doing this in Ohio, where we have as our number one industry in the State agriculture. But we also are very fortunate to have the number one polymer State in the country in terms of polymer employment and a very strong specialty chemical industry. And so the Ohio BioProducts Innovation Center was really born out of the idea of helping our polymer and chemical companies innovate by using bio-based materials from Ohio farms.

We have some amazing stories of companies that have been successful, some stories of products that we are just close to seeing the commercial scale, and a big line of entrepreneurs and small and medium-sized companies that are eager to get to that next level. So some of our stories.

First is a young woman by the name of Cathy Horton who helped to create a company called Nutek. It is a line of cleaners and lubricants made from soybeans, the soybeans grown in Northwest Ohio, processed by Mercer Landmark and a farmer-owned co-op and converted into a wide line of cleaners and lubricants.

Another product that most people from farm country are familiar with but did not really know is a composite known as Envirez. It is manufactured by Ashland Specialty Chemicals, and where people see that product is if they see a John Deere combine or tractor. The green panels that are on those combines and that farm machinery is actually a product of Ashland Specialty Chemicals.

A product that we are very excited about, think has great potential but is still in a very early start-up phase is a natural fiber composite. We work with a company called the Natural Fiber Composite Corporation that has a proprietary technology to infuse the fiber into the plastic and make a composite that competes very nicely with fiberglass, being lighter in weight, less abrasive for manufacturers, lower in cost, and comparable in performance.

And then one of the other stories that I am so excited to share about is we have a company that is a start-up company that is converting swine manure into an asphalt substitute for roofing applications. Yes, we are making shingles from swine manure.

So we do not need to put biomass in the ground and cook it for a couple thousand years in order for us to make products out of it. One of the reasons that I think this is such an incredible opportunity for the United States is this single key statistic. Three-point-four percent of all the oil we use today has a value as petrochemicals equal or closely equal to 70 percent of the oil we use today for transportation fuels. In other words, only 3.4 percent of all of our U.S. oil is used to make plastics, adhesives, paints, coatings, cleaners, detergents, those kinds of high-value products, and those products are equal in value to the 70 percent of the oil we use today for transportation fuel.

It is that key point, the value-added opportunity of taking our wonder biomass materials and converting them into specialty goods, specialty materials, much the kinds of things that my panelists here have already talked about, that I think is an incredible opportunity.

There is great demand out in the Midwest and across the country for these kinds of businesses, but we find that many of our companies very much struggle with the opportunity to hit that scale-up phase. It is very easy for them to make a beaker's worth of quantity, but when they go to make a barrel's worth of quantity for product testing that they run into trouble.

I have outlined in my testimony other suggestions that I think are appropriate, but I will just conclude with saying that I am very honored to be here today. Thank you, Senator Stabenow, for this opportunity and I look forward to doing anything I can to help advance jobs in rural America and really developing the supply chain

that can provide up to a trillion dollars' worth of material for our country.

[The prepared statement of Mr. Hall can be found on page 49 in the appendix.]

Chairwoman STABENOW. Thank you very much, and thank you to each of you. This is an area that I find very exciting, what you are already doing, and the question for our committee is what can we do to help take it to the next level. How can we be supportive, both in terms of supporting jobs for rural America and opportunities in terms of markets, continuing value-added processes, and so on for our farmers.

Let me start, Mr. Hall, with what you were just saying as you were concluding your testimony in terms of being able to go to the next level and what happens in terms of commercialization. What has been the most effective tools and strategies that you have found, and are there things that we should be doing to help companies get through what is commonly called the "valley of death," where new technologies struggle to get the financing to be able to commercialize and move forward.

Mr. HALL. Yes. That is very common problem for small start-up companies and there are several strategies for how we can help them, how we as a government can help them. First, I would say that one of the strategies that the Ohio BioProducts Innovation Center uses is to surround that start-up company with a cluster of other companies that both precede them in the supply chain and are interested in purchasing their products. In that economic ecosystem, we can help to create the relationships that can help them move forward.

But many of these companies need assistance with that next phase, that pre-commercial quantities, being able to provide sufficient material that those customers can effectively evaluate that material and see if it is going to work for them. We think that in most cases, once they have had the chance to try out these bio-based products, they are going to find them superior and beneficial in many ways to their line of products. And so being able to access that is a very big deal.

I am struck by the Biomass Research and Development Initiative Program that is a joint program between the U.S. Department of Agriculture and the Department of Energy. In 2009, there were 800 pre-proposals submitted requesting funds for that program, of which there were 22 grants awarded. The next year, people saw that and said, well, do I take the effort to write these big proposals, submit them to the USDA or to this program, only to find out that I am one of a thousand and the chances of me winning this award are so slim? The next year, the number of pre-proposals fell to 320 and eight grants were awarded.

The BRDI program is a model program. It is just underfunded. And it really would help so many companies to be able to get the sufficient quality and quantity of materials out to potential customers to address their opportunities.

Chairwoman STABENOW. Thank you very much.

Mr. Verbruggen, I noticed as you talk about Blair, Nebraska, that this is a population of about 7,500 people in a county seat which has a population of about 19,000. So this is a rural commu-

nity. I also understand that you have--NatureWorks sources the field corn for the PLA plastic produced within about 300 miles of Blair. So from a jobs standpoint, again, today, could you talk about the advantage of—a little bit more about the advantage of putting the plant where you have in a rural community in terms of quality of workforce, access to feedstock, and so on. Why does this make sense in the context of rural communities?

Mr. VERBRUGGEN. From that point of view, we are actually not too different from your traditional petrochemical company. When I said earlier on that a lot of the traditional chemical jobs are moving to the Middle East, it is they just follow their feedstock. We are doing exactly the same. So if your feedstock is in Nebraska or Iowa, you are not going to build a plant in New York. I assume none of the New York Senators are here.

So, truly, I think if you look at bio-plastics, biopolymers, you will see those plants very close to your feedstock, and the reason is very simple. Transporting feedstock is expensive. If you look at our variable cost, I would say well over 50 percent of our variable cost is feedstock. So it is to be expected that wherever you have vegetable oils or corn or any other feedstock, as my colleague here said, whatever feedstock you are going to use, that is where you are going to see the plants.

And as I indicated before, it is important here to say that this is no longer technology development. It is no longer early innovation. We are way beyond that. So we are, indeed, ready to build plants wherever the feedstock is in North America.

Chairwoman STABENOW. Thank you very much.

Mr. McIntosh, could you talk a little bit about the partnership with the United Soybean Board to replace petroleum-based products and develop the new technologies in bio-based materials.

Mr. MCINTOSH. I will. A long time ago, I learned that those who say it cannot be done are usually interrupted by somebody doing it. The USB is one of those organizations. Our partnership with them has led to some pretty amazing advancements within our industry that was somewhat stuck in the status quo, and I think some of the most difficult things for manufacturing is moving the status quo. That requires investment. That requires vision. But most of all, it requires courage. And everyone that we have been associated with with the USB continues not to rest on, as our founder and owner, Mr. Peeples, has taught me, you cannot go pick yesterday's blackberries, and they go and they are constantly looking to what is next and what is next.

One of the things that I have seen most about today, the infrastructure is in place. We now have to go execute and educate and inspire, because I genuinely believe, like they do, that everyone, given the opportunity to do the right thing, will choose that. If we can provide performance and value and environmental responsibility, that is a win-win and that is what everyone is looking for. And they have been a great inspiration for us.

Chairwoman STABENOW. Thank you very much.

Senator Thune?

Senator THUNE. Thank you, Madam Chairwoman, and I want to thank our panel for their insights.

I am a big fan of science and technology and the advances that have been made there in terms of energy issues. I think it has dramatically changed and continues to change agriculture in rural America, and I think the question is how do we in this next farm bill utilize reduced dollars that are available to fund the necessary research to promote the increased development and utilization of bio-based products and ensure a continued role for agriculture in sustainably lessening our dependence on foreign oil. And that is going to be extremely difficult because of the budgetary constraints that we are facing, and that is a challenge that we are going to have to deal with.

But it is pretty clear to me, Madam Chairwoman, that based on the testimony that we received from the witnesses today here that they are already moving rural America forward with a lot of these innovative, common sense approaches to growing America's potential and to securing its sustainability. Bio-based products hold an exciting future for agriculture and potentially can help the United States to recapture chemicals and manufacturing jobs that we have been hemorrhaging to foreign countries.

I just have a couple of questions, if I might, in that vein, and I would like to direct this one to Dr. Peoples. What do you think that the plastics and manufacturing industries in this country need to shift manufacturing back to the United States?

Mr. PEOPLES. You know, fundamentally for the plastics manufacturing in this country, it is really about what is the opportunity and what is in it for them, quite frankly. And I think what is in it for them is really a whole new feedstock, which is basically the agricultural resource plus the technology that enables it to be converted into plastics that they can then use, as NatureWorks has ably demonstrated. And so I think it is really about them recognizing that there are materials coming along which can do the job, that they are bio-based, that they are made in America based on American feedstocks, using American employees, and I think it is a matter of them just recognizing that that is the case.

In terms of what the Federal Government can do, my own view is I think you can help to create the demand, the demand for bio-based content. There are rules in place at the USDA for that already in some areas and I think that is an area where you can be very effective in helping to deal with this industry in the United States.

Senator THUNE. Do any of the tax policies need to be changed?

Mr. PEOPLES. I really do not—I am not really able to comment—

Senator THUNE. You do not dabble in that?

Mr. PEOPLES. I do not dabble in that. I am a scientist and I like to—

[Laughter.]

Mr. PEOPLES. —to stay within my comfort zone, which is I am happy to talk about the next great discovery, but it is really not my place to talk about tax policy.

Senator THUNE. Right. Yes.

Mr. PEOPLES. My colleague can perhaps comment.

Mr. VERBRUGGEN. Thankfully, I am not a scientist, so I can talk about it.

[Laughter.]

Mr. VERBRUGGEN. No, I think what is very important right now is to get for the bio-plastics industry something like a production tax credit initiated for two reasons. If I look at some of my colleagues, which are early start-ups, a production tax credit can be the difference between being non-competitive compared to traditional plastics in that early stage of development, versus being more competitive and therefore quickly helping the industry displacing traditional plastics, traditional chemicals.

For a company like myself, like ourselves, NatureWorks, having a U.S. tax credit in place will make the U.S. more competitive versus foreign governments. I mentioned in my testimony that in a Southeast Asian country today which I will not name, you get a 15-year tax abatement for bio-plastics investment. We are working in a global economy. We are working in a global business. So the U.S. for getting investments in the United States will compete with those types of countries.

So it will do two things, the production tax credit. It will help companies like NatureWorks, who are established, who are selling around the world, investing in the United States rather than somewhere else. For start-ups, it will make them more competitive out of the gate and, therefore, will help them grow quicker.

Senator THUNE. Let me direct this question, if I might, to Mr. McIntosh. What commodity crop do you see as having the most potential to produce bio-based products?

Mr. MCINTOSH. There are two within the carpet industry right now that are pliable for what we do in backings, that being soy and also corn, poly-light [phonetic] gasses out of corn. Our research has shown and our performance has shown that soy-based products are performing better in our backing systems. Being in the commercial end of our business, neither provide the tensile strength for a face fiber quite yet. The USB is funding and supporting a lot of research to be able to do that, because right now, the most embodied energy of a piece of carpet is in its fiber with nylon. So we are working hard to do that. But right now, it has been the soy-based products.

Senator THUNE. Do you see that changing?

Mr. MCINTOSH. You know, I would need to check with our chemists, but I know everything that we are doing right now, our investment in our own plants to create polyols, I do not see it changing any time soon.

Senator THUNE. Thank you, Madam Chair. Thank you all very much.

Chairwoman STABENOW. Thank you very much.

Let me just conclude by asking each of you, and we have begun to really talk about it a bit in terms of a production tax credit, but if there was one thing that we could do to help move this forward so that we are really developing large-scale production of bio-based products, what would that be? Dr. Verbruggen.

Mr. VERBRUGGEN. Let me start with this comment. It is something very obvious. I think the USDA, about, I think, six months ago, it might be a little bit longer, came out with a "BioPreferred" label, and I think for the first time, consumers all over America have now the option to choose between a traditional packaging ma-

terial or a bio-plastic. And again, you see a lot of them around here. That by itself will create demand, because you could go in a Walmart a year ago and see our products everywhere, but often very difficult to recognize. Now, with that label on there, with the stamp of the U.S. Government on it, I think that will really spur demand. With demand come jobs, comes investment. So support for that particular program is going to be very important, for example, if you look at the next farm bill.

Chairwoman STABENOW. Thank you very much, Dr. Peoples?

Mr. PEOPLES. I would reiterate that and also indicate that I think there is a role in this for small businesses in terms of getting something similar to the set-aside program for small businesses so that small businesses can compete in this area. This is a very capital-intensive industry and it is very difficult for small businesses to participate in that way. So I would recommend that on top of what Marc said.

Chairwoman STABENOW. Thank you, Mr. McIntosh?

Mr. MCINTOSH. I think a purchase order for the 500,000 buildings in the U.S. Government that represents three billion square feet would be a good start.

Chairwoman STABENOW. A good place to start.

Mr. MCINTOSH. Yes, ma'am. But seriously, I was going to mention the USDA BioPreferred program. What we are dealing with is education, is educating the consumer that there is a better alternative, a more not only environmentally responsible, but socially responsible, as well, that improves performance.

So just the fact that I get to sit here from Dalton, Georgia, to be able to share with you these exciting things is somewhat overwhelming in itself. But our goal and I think where the government can help is in the GSA contracts which we are going to be taking the Yellowstone project to, the farm bill act that has already been placed. So all of these things are helping. But what I have learned is that it takes time. It is a crock pot, it is not a microwave fix. And it is going to take more and more people like Yellowstone that are in a leadership position, and everyone realizes that, the first national park and does incredible work.

And so those are the type of things that will help because it starts all the way—our wellhead is a farmer's field and it goes to an end product that is never put in a landfill. And so throughout the entire chain, from installers to farmers to mill workers to whomever touches it, maintenance people and things of that nature, just the exposure and the education to be able to create demand.

Chairwoman STABENOW. Thank you, Mr. Hall?

Mr. HALL. The Federal Government does a lot of really good things right now, and the Hatch Act that provides for research funding, the Smith-Lever which provides for extension, outreach programs, are very important, and we would not have an Ohio Bio-Products Innovation Center in Ohio if we had not had those funds.

But I think the current farm bill has one excellent program that—one model program that misses the mark for bio products, and that is the Bio-Refinery Assistance Program, Section 9003. It misses the mark in two ways. The first is that its focus is solely on advanced bio-fuels and we are not able to use this kind of pro-

gram to target these much more higher value-added products, the plastics and the advanced materials.

And the second thing is the existing paradigm is that of rural development for that program, rural economic development, not agricultural economic development. We see great alliances, great opportunities to partner with major corporations that happen to be in the city, you know, and being able to more fully exploit that opportunity of connecting the agricultural resources to companies like a Goodyear or an Emery Oleochemicals would be very valuable, who happen to be in Akron and Cincinnati.

Chairwoman STABENOW. Well, thank you very much to all of you. This is an area, I think, of really exciting opportunity for our country and certainly for rural America and we want to thank you for being here as a part of this.

I would say that any additional questions for the record should be submitted to the Clerk five business days from today, which is Thursday the 21st of July at 5:00 p.m.

Let me also say that we, at our very first hearing back in February, gave an overview of agricultural and rural economies and the importance of jobs. We started from the perspective of jobs, 16 million people working in rural America in agriculture. And some, I think, off this committee were actually surprised that our agricultural economy is leading the nation's economic recovery, which is, in fact, true, and we want to continue to stress that and continue to lead that. But agriculture will continue to lead the country in creating new opportunities in small towns in rural communities across America with all of our efforts.

We heard today we can spur job growth, reduce our dependence on foreign oil, and add value to farmers' agricultural products by supporting innovations such as the emerging bio-based manufacturing sector and encouraging energy efficiency improvements through legislation like the Rural Energy Savings Program. We are going to continue in the weeks and months to focus on these and other issues that will strengthen our economies in rural America and ensure that American agriculture continues to thrive, and I think this is a great opportunity for us to work together to make sure that happens.

So thank you very much and the meeting is adjourned.

[Whereupon, at 11:26 a.m., the committee was adjourned.]

APPENDIX

JULY 14, 2011

Senator Pat Roberts
Statement and Questions for the Record
Senate Committee on Agriculture, Nutrition and Forestry
Growing Jobs in Rural America Hearing
July 14, 2011

Statement for the Record

Thank you Madam Chairwoman for continuing our look into programs for the next Farm Bill. You have outlined two issues that I believe fall into the energy and rural development titles and I look forward to continued discussions about all the titles of the Farm Bill.

As you and I have mentioned here before, we need to look closely at all programs and whether they are generating the results we expected from the 2008 bill, and be very mindful of any duplication of efforts to ensure that we are using financial resources wisely. I look forward to hearing from the witnesses about these energy efficiency and biobased product programs and additional programs they might have used. In particular, the Rural Energy for America Program, which provides grants and loan guarantees for energy audits and the installation of energy efficient systems, is a very popular program that we authorized in the 2008 Farm Bill. Farmers, ranchers, rural small businesses, local governments, and rural electric cooperatives have benefited from this program. I look forward to hearing from witnesses on how we can improve this program as we begin our Farm Bill policy discussions.

Regarding jobs, I must say that the number one issue I hear is the impact of EPA regulation of businesses. Whether it is expansion of existing businesses or creating new businesses, the regulatory burdens that EPA is creating and expanding are out of control. Dust, water, pesticides are just a few of the regulations that we have discussed related to the agriculture communities.

To address these issues with EPA as well as other agencies and departments, I introduced, the "Regulatory Responsibility for our Economy Act of 2011" which would strengthen and codify President Obama's Executive Order from January 18.

The President made a commitment to review, modify, streamline, expand, or repeal those significant regulatory actions that are duplicative, unnecessary, and overly burdensome or would have significant economic impacts.

My bill would ensure just that! It would also require that all regulations put forth by the current and future Administrations consider the economic burden on American businesses, ensure stakeholder input during the regulatory process and promote innovation.

My legislation would ensure that this happens by laying out specific conditions that the federal regulatory system must meet. It also puts forth new, and codifies existing, agency requirements for promulgating regulations.

In a Wall Street Journal Op-ed, the President stated, "We have preserved freedom of commerce while applying those rules and regulations necessary to protect the public against threats to our health and safety and to safeguard people and businesses from abuse."

But he also noted, "sometimes those rules have gotten out of balance, placing unreasonable burdens on business - burdens that have stifled innovation and have had a chilling effect on growth and jobs."

I absolutely agree with the President. I hear from Kansan after Kansan who find themselves weighed down by the deluge of regulations that threaten the future of their businesses.

The President's Executive Order "requires that federal agencies ensure that regulations protect our safety, health and environment while promoting economic growth." So does my legislation.

We need to ensure that agencies are not overstepping their statutory authority, but also that they are fulfilling their regulatory duties in a transparent manner. EPA's inaction on approving new products adversely impacts small businesses from expanding their operations. In the last week, my staff has been visited by two small business owners seeking regulatory approval of their products. They traveled to Washington to voice their concerns and I think we need to recognize the impact this is having. We need transparency, consistency and a process that allow business owners to make decisions. Let's give these businesses the tools they need to operate, that's what will generate more jobs.

Finally, I want to recognize a fellow that will be testifying on Panel I today. Bruce Graham may be here on behalf of the Indiana Statewide Association of Rural Electric Cooperatives, but I'm sure he's honored to tell you that he cut his teeth down in my home state of Kansas. Bruce spent nearly 20 years as Vice President of External Affairs for Kansas Electric Cooperative, Inc., one of our largest co-operatives in the state. I welcome you today, and look forward to your testimony and hearing from the others as well.

**Agriculture Committee Hearing
July 14, 2011
Growing Jobs in Rural America
Opening Statement
Prepared for Senator Robert P. Casey, Jr.**

Madam Chairwoman, thank you for calling today's hearing.

I am committed to keeping our rural communities strong and productive. Today's hearing is a good way to focus attention in Washington on the needs of rural Pennsylvania and rural communities around the country.

The majority of my home state of Pennsylvania is rural. Since 1989, growth in Pennsylvania's rural areas has surpassed that of our urban areas: six percent versus four percent. Since 1987, job growth in rural Pennsylvania has been twice as fast as in urban Pennsylvania: 25 percent versus 13 percent.

Rural manufacturing certainly has an important role to play in creating a strong economic base for rural towns. Manufacturing still accounts for 22 percent of total wage income in nonmetropolitan Pennsylvania compared with 17 percent in metropolitan Pennsylvania. Penn State research shows that for Pennsylvania's rural counties, a higher degree of industry diversity and a better educated workforce contribute to lower rates of unemployment and underemployment. It is also clear that our farmers will increasingly grow crops to produce bio-based products, which will also help to bolster our rural economies.

I am very interested in opportunities that will help keep our rural communities strong and productive. I have supported the Farm Bill and other rural development programs, such as those that provide loans and loan guarantees to rural businesses to provide economic opportunities and create jobs. By increasing access to capital, we can help provide economic opportunities and create jobs. I have also supported programs like the community facilities program, which helps to provide places like hospitals, child care centers and libraries, which are the beginning of job creation and education. I support infrastructure and utility programs for water, wastewater and telecommunication that help to attract and keep businesses and provide the basis for sustained economic development.

As Chair of the Joint Economic Committee, I have outlined various ways to lay the groundwork for future growth in manufacturing: a comprehensive national manufacturing strategy, making permanent the R&D tax credit, cracking down on China's currency manipulation that is putting Pennsylvania workers and manufacturers at a disadvantage and sending jobs overseas and extending working training programs through Trade Adjustment Assistance.

I am pleased that Chairman Stabenow called this hearing so we may continue to discuss opportunities for increasing good jobs for Pennsylvanians and all Americans in rural communities.

SENATE COMMITTEE ON AGRICULTURE, NUTRITION AND FORESTRY
FULL COMMITTEE HEARING

GROWING JOBS IN RURAL AMERICA

Thursday, July 14, 2011 – 9:30 a.m.
G52 Dirksen Senate Office Building

Madam Chairwoman and Ranking Member Roberts, I would like to thank you for holding today's hearing on "Growing Jobs in Rural America."

I believe one of the greatest challenges for those of us on the Agriculture Committee is to develop policies and programs in the upcoming Farm Bill that look beyond the current higher than normal prices received for crops and livestock to the overall landscape of Rural America's economic health.

Advances in science and technology and energy issues have dramatically changed and continue to change agriculture and Rural America.

How we utilize the reduced dollars available to write this Farm Bill to fund necessary research, promote increased development and utilization of biobased products and ensure a continued role for agriculture in sustainably lessening our dependence on foreign oil is going to be extremely difficult.

Madam Chairwoman, based on the testimony from the witnesses here today they are already moving Rural America forward with innovative common sense approaches to growing Rural America's potential and securing its sustainability.

Biobased products hold an exciting future for agriculture and potentially can help the United States recapture chemicals and manufacturing jobs that have been bleeding to foreign soils.

Economic development can be increased through development of high-valued green jobs.

Biobased products can improve our balance of trade and enhance energy security in this country.

Madam Chairwoman, I appreciate your holding this hearing on growing jobs in Rural America, especially with its focus on green jobs and biobased products.

As we all know the Farm Bill covers farm more than its name implies, to food, nutrition, energy, research and many more.

Madam Chairwoman, as we debate the upcoming Farm Bill, as we draft a Bill that provides assistance for each sector of the agriculture community, we need to look at the overall landscape of Rural America to make certain that federal farm program policies effectively sustain the economic health of Rural America.

7-14-11

U.S. Senate

Senate Committee on Agriculture, Nutrition and Forestry - Public Hearing

Review of the Rural Energy Savings Program Act

Good morning Chairwoman Stabenow, Senator Lugar and distinguished members of the Senate. It is truly an honor and pleasure to be here this morning to offer support for the Rural Energy Savings Program on behalf of my employer ClimateMaster, an Oklahoma based manufacturer of geothermal heat pumps with over 1,000 dealers and distributors across the U.S.

I am Paul Bony, and I have 25 years of electric utility experience focused on energy efficiency, renewable energy and demand management. I have worked for 2 electric cooperatives, including one where my Great Uncle was the first elected Board president, and I am a member of an electric co-op. Thanks to the 5th Army I am a native Hosier, I have a degree in Ag from Kansas State University, and I own a registered farm in Colorado.

Based on my experience, this pending legislation will provide many benefits to electric cooperatives and the members they serve.

This legislation will save energy. Buildings use nearly 40% of all US primary energy with heating, cooling, and water heating accounting for nearly one half of this use and as much as 70% of the total energy use of rural homes. Geothermal heat pumps can reduce this energy consumption by up to 50%.

This legislation will also **save rural consumers money.** Most rural areas do not have access to well capitalized and organized energy retrofit companies. Rural areas also rely on a high proportion of expensive fossil fuels for heating. Customers can benefit greatly from energy efficiency upgrades including geothermal heat pumps that provide energy bill reductions that exceed the loan payments made under the proposed RES program.

I conducted an extensive home energy retrofit project that confirmed home owners can easily reduce their annual energy use by 50% or more from efficiency measures that provided a positive cash flow after debt service. In a survey we recently completed 53% of our potential customers would have purchase our system if they could have obtained financing that would provided a payment lower than their energy savings, giving them a positive cash flow.

Unfortunately, in today's tough economy, customers do not have ready access to affordable loan funds to implement efficiency measures. This legislation will be invaluable in breaking this financial barrier.

This legislation will also create jobs. The Energy Efficiency upgrades financed by this legislation will generate employment for local labor. For geothermal heat pumps, the installation of the equipment and ground loop has to be done locally. We will never import ground loops from off shore.

I started a company that focused exclusively on the installation of 50 to 70 geothermal heat pump systems annually. This company employed 7 full time people in good paying jobs with full benefits. It also hired other contractors to provide services including energy audits, drilling ground loops, and weatherizing homes.

This legislation will improve the financial stability of participating co-ops. Geothermal heat pumps offer cooperatives an excellent tool to obtain significant peak load reduction and improved system load factor. This allows a co-op to provide energy efficiency to their members and reduce the need for expensive new generation, without putting pressure on electric rates. These energy savings also provide 4 to 10 metric tons of annual carbon savings per home.

Electric co-ops are a great vehicle to administer the RES program. They have a long track record of providing member focused services and paying back their federal loans. They are trusted by their members. They can collect payments on utility bills and in rural

communities they are often the only organization with the resources and talent to administer this type of effort.

I recognized over 15 years ago that access to affordable financing was the key to customer participation in energy efficiency, when I started a successful utility geothermal loop lease program that is still working today in California.

In Colorado, I again proved that consumers will respond to co-op financing to make efficiency investments. While individual members in my loan portfolio experienced the misfortunes that can happen to any of us, it always generated a positive cash flow. I can also assure you that my General Manager and our board of directors paid close attention to my monthly reports on this loan portfolio.

However in both programs, our ability to fund member efficiency was limited to internally generated funds, as the RUS was not able to finance these efforts.

This legislation will close this large financing gap and in my humble opinion greatly accelerate the implementation of energy efficiency in co-op country.

In conclusion, ClimateMaster is very supportive of this legislation. I am convinced that it will provide great benefits to the millions of members of electric cooperatives. It closes the financing gap that has prevented the greater adoption of energy efficiency in rural America and it leverages the resources and talent embedded in America's electric cooperatives.

Thank you for giving me the opportunity to share my comments with you this morning.

Testimony of Bruce Graham

Indiana Statewide Association of Rural Electric Cooperatives, Inc.

Before the

Senate Committee on Agriculture, Nutrition and Forestry

July 14, 2011

Madame Chairwoman Stabenow, Ranking Member Roberts, Senator Lugar and Members of the Committee, I thank you for inviting me to provide the views of the electric cooperatives on the Rural Energy Savings Program Act (RESPA), a cost-effective program that will save energy and create jobs in rural America. It is an honor to appear before this Committee.

I am the Chief Executive Officer of the Indiana Statewide Association of Rural Electric Cooperatives, which was the first statewide cooperative association of its kind. Indiana's electric cooperatives provide safe and affordable energy to more than 500,000 homes, farms and businesses, while we continue to lead the way in making energy efficiency manageable for our consumer-members across the state.

Nationwide, there are 930 not-for-profit, member-owned, rural electric cooperative systems which serve 42 million customers in 47 states. The National Rural Electric Cooperative Association (NRECA), our not-for-profit national service organization, estimates that cooperatives own and maintain 2.5 million miles or 42 percent of the nation's electric distribution lines covering 3 quarters of the nation's landmass. Cooperatives serve approximately 18 million businesses, farms, schools and other establishments in 2,500 of the nation's 3,141 counties.

Cooperatives still average just seven customers per mile of electrical distribution line, by far the lowest density in the industry. Given the low population densities and vast rural areas, we face many challenges in our mission to provide a stable, reliable supply of affordable power to our consumers that include constituents represented on this Committee.

Rural electric cooperatives have far less revenue than the other electricity sectors to support a greater share of the distribution infrastructure. The challenge of providing affordable electricity is critical when you consider that the average income for households in co-op service territories is 14 percent below the national average.

One major challenge facing electric cooperatives is how to help their consumers invest in energy efficiency improvements for their homes and businesses so that they can save on their energy bills, while also helping cooperatives avoid the long-term costs and environmental impacts of building new electric infrastructure.

The Need for a New RUS Program Dedicated to Energy Efficiency Savings

Electric cooperatives came about during the economic hardship of the Great Depression 75 years ago, when the federal government established the Rural Electrification Act (REA), a self-help loan program for the purpose of providing electricity, infrastructure and improving the lives of a determined rural population. Now called the Rural Utilities Service (RUS), Congress has continued to authorize these loans to not-for-profit utilities to build and maintain a highly reliable electricity infrastructure that includes generation facilities, transmission and distribution.

Although efficiency investments have always been part of the culture of the electric cooperatives and part of the RUS mission, the authorization of efficiency loan programs under Section 6101 ("Energy Efficiency Programs" in the 2008 Farm Bill) recognized that efficiency investments are now a key component of providing electricity services to consumer-members of RUS borrowers. However, the current RUS loan program is usually oversubscribed just to meet basic infrastructure needs of RUS electric utility borrowers. Further, the RUS program provides loans for our infrastructure that provides electricity to our consumers. We serve, but do not own, the homes and businesses that would receive energy efficiency upgrades at the request of the consumer-member.

Electric cooperatives across the nation, including many in Indiana, have for years encouraged energy efficiency through rebates to consumers. Some co-ops across the country provide financing for consumers as well. Other types of assistance range from replacing compact fluorescent light bulbs, to more full-scale home efficiency upgrade assistance as provided by Hoosier Energy in Indiana. Hoosier's current efficiency program, born out of stimulus funding, was so successful that they have received a second grant to extend the life of the program.

Some co-ops are able to provide efficiency services within their own programs, but up-front costs for consumers remain a barrier, even if the costs will be recovered through efficiency savings in the long run, or through tax credits or rebates. With limited financial resources at their disposal, it would be difficult for many rural electric cooperatives to make these energy efficiency loans widely available to its consumers, and a part of our continuous utility service.

The Rural Energy Savings Program was designed to address these barriers while minimizing the impact on the federal budget. The current Senate proposals utilize existing RUS loan procedures instead of creating a new federal infrastructure. The RESPA loan program allows cooperatives to assume 100 percent of the risk of providing efficiency loans to consumers and for repaying the federal government.

The co-ops stand ready and willing to go out front and shoulder the costs of these energy efficiency improvements. The electric cooperatives already have the billing systems in place to allow the consumer to repay the loan on their electric bill. Cooperatives have created several centralized data and billing operations that will allow them to track the

energy usage before and after the installation of energy efficiency upgrades by consumers.

This program will be cost-effective because RESPA has a stringent cost-benefit requirement that any investment in efficiency retrofits must be able to pay for itself in energy savings in ten years or less. This precludes efficiency technologies that are not cost effective within a ten year period. Because cooperatives are on the hook for paying back the federal loan, there is an enormous incentive to make sure that the program works, that the savings promised occur, and that the consumer-owner gets the value promised. The cost-benefit test means that not every new trend in efficiency technology on the market will be used.

The program is focused only on upgrades that are a structural part of a home or business that is in the cooperative service territory. This program is not targeted at such things as energy efficient appliances, but rather on cost-effective improvements to the “building envelope,” such as: HVAC systems, heating boilers, windows, geothermal systems and high-rated insulation. This is because a significant goal of the program is to reduce the need for expensive investment in new electric infrastructure, while supporting the obvious job-creation for contractors and equipment manufacturers.

I must note that this proposed legislation targets “energy” savings, not just electricity savings. As a result, it is possible that “electricity” usage and consumer bills will go up but overall energy usage and bills will go down significantly more. An example would be if a cooperative decides to include in their program the replacement of old inefficient fossil fuel furnaces with high efficiency geothermal systems or heat pumps.

Importantly, The Rural Energy Savings Program Act also has the potential to create jobs in rural America for energy auditors, contractors, installation crews, and thousands of jobs to manufacture the new windows and doors, insulation, heating and cooling systems and other energy saving building improvements.

Electric Co-ops are Committed to Energy Efficiency

The not-for-profit business model encourages cooperatives to use all cost-effective methods to keep electricity affordable for the consumers who own the cooperatives. Rising costs of new generation resources mean that efficiency is often the “least-cost” generation resource. A commitment to increase the quality of life for consumers makes efficiency investments an important priority.

Co-ops’ engagement with energy efficiency has resulted in the following achievements:

- Cooperatives serve only 12 percent of the nation’s consumers but are responsible for nearly 25 percent of the nation’s residential peak load management capacity.
- 96 percent of cooperatives operate an efficiency program.
- 70 percent of co-ops offer financial incentives to promote greater efficiency.

A New Proposed RUS Lending Program Will Boost Co-ops' Efficiency Efforts

Under this proposed legislation, the RUS program, under the U.S. Department of Agriculture (USDA) will administer the loans at the heart of RESPA. Under current proposals, RUS will be able to issue zero interest loans to individual co-ops or state-based groups of co-ops to fund low-interest (no more than three percent) loans to consumers and businesses. A co-op borrower can also tap a "jump-start" loan of no more than 4 percent of the loan amount to cover initial costs of providing service to the first consumers until the cooperative receives loan funds. RUS will use its existing procedures to approve loans and advance funds. In accordance with current practice in RUS electric programs, no loan funds will be advanced on approved loans until the co-op borrower submits documentation of work completed for the approved purposes of this program.

Every RESPA dollar loaned by RUS to a cooperative will be repaid within ten years after the cooperative re-lends the funds to the consumer. There is zero risk to the federal government for consumers' repayment because the co-op will absorb the risks of the payment of consumer loans. Further, the participating co-op will have to expend its own funds to set up and manage the program in the same way cooperatives outlay funds to pay for the costs of adding new generation.

Co-ops and Consumers Will Work Together to Use RESPA Funds Wisely

It should be noted that rural electric cooperatives have an extraordinary track record of positive payment under the RUS electric loan program, and look forward to continuing this trend under RESPA.

The cooperative applicant will specify the efficiency measures it intends to implement and the expected savings for consumers. When a RUS loan is approved, the co-op, in turn, will provide low-interest micro-loans to consumer residences or businesses if an energy audit indicates potential for significant energy savings.

Consumer loans would cover sealing, insulation, HVAC systems, boilers, roofs, windows, and other improvements that co-ops can demonstrate will produce sufficient savings. Consumer loan amounts from the co-op may only be used to make energy efficiency improvements to fixtures that convey with the house or business dwelling. Loans may not be used for appliances that do not convey with the structure, such as refrigerators or window AC units.

Participating consumers will repay the co-op for the installation and material costs through an extra charge on their utility bills within no more than ten years. The energy savings from the upgrade will cover most, if not all, of the cost of the loan. After the loan is repaid, consumers will continue to save on energy bills, potentially hundreds of dollars annually.

Ensuring a Culture of Accountability

As part of standard RUS procedure, every RESPA loan recipient will annually provide to RUS:

- Evidence of no self-dealing.
- Review of program effectiveness as defined by measurement and verification results.
- Efficiency contractor qualifications.

Funds should be provided for a program-wide measurement and verification system to track quality control and savings for the ten-year loan period. A training program should be included to provide utility auditors with information about how to implement the measurement and verification of savings, how to establish contractual relations with efficiency upgrade contractors, and how to assist consumers receiving efficiency upgrades.

Pilot Programs Will Ensure Quick Start and Strong Program

The first cooperatives applying for loans are to be considered “pilot” projects to allow more rapid internal RUS movement as well as to establish what works and what does not work.

Conclusion

Again, thank you for the opportunity to testify at today’s hearing. The electric cooperative industry faces many challenges, including developing a viable way to provide large-scale consumer access to efficiency savings. However, the cooperative business model and the public-private partnership with RUS make cooperatives well-equipped to find innovative solutions. We look forward to working with members of this Committee on this program to promote energy efficiency in Rural America.

TESTIMONY OF DENNIS HALL, ASSISTANT DIRECTOR,
OHIO BIOPRODUCTS INNOVATION CENTER
THE OHIO STATE UNIVERSITY
BEFORE THE U.S. SENATE
COMMITTEE ON AGRICULTURE, NUTRITION & FORESTRY
JULY 14, 2011

Chairwoman Stabenow, Ranking Member Roberts, and Members of the Committee, thank you for the opportunity to speak with you today. It is a privilege to come before you to discuss the exciting potential of bioproducts and biobased manufacturing.

For the past 6 years, I have served The Ohio State University as the Assistant Director of the Ohio Bioproducts Innovation Center (OBIC). OBIC was established in 2005 as an economic development organization with the mission to accelerate commercialization of polymers, specialty chemicals, and advanced materials made from renewable biobased feedstocks. OBIC connects technology development in Ohio's agriculture industry to specialty chemical, polymer, and advanced materials industries. Farmers, rural communities, and agricultural businesses, and ultimately all consumers, benefit from new markets for commodities. In addition, the polymer, specialty chemicals, and advanced materials industries gain from development of innovative new feedstocks and materials. And that means jobs.

OBIC has a history of successfully providing technical and commercial assistance to economic development projects in Ohio by connecting its network of academic, industrial, and farm, chemical, and polymer organizations. The Center has developed nearly a dozen bioproduct clusters involving supply chain members, researchers, and policy-makers to produce bio-based products such as soy-based thermoset resins, natural fibers and fillers for composites, and anaerobic digestion of biomass wastes. Awarded \$9.6M in capital funds and \$1.9M in operating funds from Ohio Department of Development (ODOD) in 2005, OBIC has since leveraged that investment by assisting 60+ collaborators in obtaining over \$100 million of supplemental funding to drive program activities. For example, the NFCC/OBIC partnership has so far created or retained 10 jobs in the Ohio supply chain while 12 new jobs and \$3 million in revenue are expected by the end of 2012.

More OBIC Success Stories

I want to tell you about some of the really cool products that you will begin to see or have already used, but did not realize they first came from someone's farm or ranch.

- Ohio is very proud of a recent start-up company known as Nutek that has developed a complete line of cleaning and lubricant products from soybeans

grown in northwest Ohio.

- If you have seen a late-model John Deere combine or tractor, the green hood and panels are made from a soy/corn composite material manufactured by Ashland Specialty Chemical with headquarters in Dublin, Ohio.
- A new plastic material that is infused with natural fibers is being marketed in construction products and been prototyped for several auto parts.
- And we have another start up company that is processing swine manure into an asphalt substitute that will be used in the manufacture of shingles and other roofing materials.

The key point in all of these examples is that we do not have to bury biomass deep in the Earth and let it cook for a couple thousand years in order for it to be useful to us. We are able to harvest these valuable chemicals today from plants grown on American farms.

Ohio has made bioproducts development an area of strategic importance. We did this because Ohio's number one industry is agriculture and the State is ranked first in the nation for employment in the polymer industry. The nexus of these two industries—where agriculture and the polymer industries meet—is the area where there is untapped potential and an opportunity for innovation and significant economic growth. The economic benefits of biobased products go beyond creating good manufacturing jobs throughout the country. Manufacturing value-added products that utilize biobased adhesives, cleaners, composites, paints, plastics, and rubber also creates new market opportunities for farmers who grow commodities and are interested in diversifying into new types of feedstocks while simultaneously making better use of existing and abundant biomass resources that go to waste today.

Why Bioproducts?

Research and development efforts to create new supply chains to replace high value petrochemicals have been launched across the country to satisfy future material demand. Reasons for these initiatives include a new source of income to the agricultural sector, innovations emerging in ag-biosciences, consumer demand for environmentally friendly products, and perhaps most significantly, risk management of price volatility and supply availability of oil-derived feedstocks. In 2008, interest in biobased materials was especially keen as oil hit \$146/ barrel.

From a public policy perspective, Ohio identified bioproducts as a strategic area of emphasis because of a) market pull from Ohio's more innovative polymer and advanced materials companies, b) existence of critical mass and portions of the entire supply chain within the state's borders, and c) value-added opportunities associated with specialty chemicals and advanced materials. Consider the current use of oil in the U.S. and the relative value of specialty chemicals compared to transportation fuels. According to the U.S Department of Energy, Americans use 70% of our oil for transportation fuel at a total value of \$385 billion. In contrast, we

only use 3.4% of our oil consumption for specialty petrochemicals, but at a value nearly equal to that of transportation fuel, \$375 billion, or 22 times higher on a per share basis. Production of value-added materials is a source for significant increases in jobs across the supply chain, but especially in the production and pre-processing of biomass resources in rural America.

Individuals are often surprised by some of the innovative biobased materials that corporate and university researchers have identified. For example, a start-up company in Ohio with assistance from OBIC is commercializing a new process to convert swine manure to an asphalt supplement for road and roofing applications. Another OBIC start-up is commercializing a proprietary process to compound natural fibers for composites as an alternative to fiberglass with the benefits of lower cost, lighter weight, and comparable performance. OSU researchers are domesticating a new plant, *Taraxacum kok-saghyz*, or commonly known as Russian Dandelion, as a novel source of high-quality natural rubber.

The Challenge of Commercialization

As exciting and promising as these ideas are, progression through the stages of technology commercialization from concept to established market can have multiple barriers with some of the largest occurring at the pre-commercialization phase.

Large investment of resources for infrastructure, supply chain development, prototype demonstration, scale-up, or market analysis is often necessary. Obtaining capital at this stage in the process is difficult and an area where government resources can make a profound difference.

Corporate leaders have identified that obtaining pre-commercial quantities of biobased materials for product testing and development is their top priority (Hall 2007). What is difficult is determining who should pay for these materials. The start-up company often lacks financial resources necessary to provide these materials to interested customers. Potential customers of these novel materials typically consider the risk of paying the full cost of producing pre-commercial quantities greater than the potential gain of finding a material that it will out-perform products from existing suppliers. This barrier is generally referred to as the "Valley of Death" as technologies often struggle to survive this challenge.

New biobased technologies can be extremely beneficial to our country's economic growth and long-term stability. Traditional venture funding for biobased chemicals and polymers may require demonstration of commercial scale production before agreements are made to invest. Crossing that "valley" can require more than one bridge (Scharfenberger 2011). To span this gap financially, multiple support systems are needed including public and private (venture capital) funding as well as operational support that can be provided by economic development centers. These support systems provide the information that potential investors require to help take that product to market.

The creation of corporate networks and geographic clusters can also catalyze biobased technology commercialization because they increase productivity making companies more competitive (Porter 1998). Establishing these new biobased ecosystems can be a slow process and require entities to reach out to new partners. This can be hindered by geography, policy, or lack of resources. A neutral third-party such as an economic development center whether linked to a university or other entity, can lower these barriers by creating information-sharing networks. OBIC has served this function in Ohio since 2005.

Model Programs to Address These Challenges-

USDA has several programs that can make a difference in the area of bioproducts, but in most cases they are either substantially underfunded or need to be modified. Small and medium sized companies need assistance in validating their business case and lessening the risk to future investors.

A great program that has helped several products make it to market is the Biomass Research and Development Initiative (BRDI) jointly administered by USDA and DOE. In 2009, 800 pre-proposals were submitted for 22 grant awards. The following year, many worthy programs did not bother to apply because of the low chance of winning and applications have fallen to 320 pre-proposals with 8 awards in 2010 and 240 pre-proposals in 2011 (awards have not yet been made for this year's applicants). OBIC has collaborated on one of the successful awards and we see this as an excellent program, but have been hesitant to encourage applications due to lack of awards commensurate with the program demand.

The Biorefinery Assistance Program (Section 9003) and the Rural Energy for America Program (Section 9007) are model programs with two problems that limit their utility for bioproducts. The first is that their focus is solely on advanced bio-fuels (9003) and energy (9007) and they miss the opportunity to target high value bioproducts. Second is the paradigm of rural economic development, not agricultural economic development. Many great alliances can be created between rural communities where biomass feedstock development and preprocessing can occur in collaboration with chemical compounders and manufacturers who are located in an urban setting.

We are very excited about involvement in the Northeast Bioenergy and Bioproducts Professional Development for Educators project headed by Cornell University and funded through a USDA grant in sustainable bioenergy. This program will provide training for sixty-six educators annually through six sites giving teaching tools necessary to inspire students in science, technology, engineering, agriculture and math career paths and help lead future generations in the emerging bioeconomy.

Closing-

In the Feature Commentary of the Winter 2009 issue of *Industrial Biotechnology*, Kevin Jarrell of Modular Genetics (Jarrell 2009) articulates a new era in sustainable chemistry. Building off the revolution in chemical production that occurred between 1930 and 1960 by adding the new tools of biotechnology, Jarrell suggests that as many as 50,000 new products collectively worth roughly \$1 trillion is achievable.

As society wrestles with the ongoing challenge to lessen our dependence on petroleum, the question becomes what percent of that \$1 trillion industry will be manufactured in the United States? And how many jobs can we create and retain? The current trend of chemical manufacturing moving to other countries is attributed to the lower cost of producing commodity chemicals in these countries, but it does not have to be that way. The U.S., a land that is home to great scientists and industry, prime farmland, beneficial climate, and abundant water resources, has the opportunity to stake its claim on a sustainable system of novel products and accelerate efforts to make that challenge another great American success story.

Thank you again Chairwoman Stabenow, Ranking Member Roberts and Members of the Committee for allowing me to speak with you today. I applaud your leadership as you continue your work to support the nation's rural communities. I look forward to answering any questions.

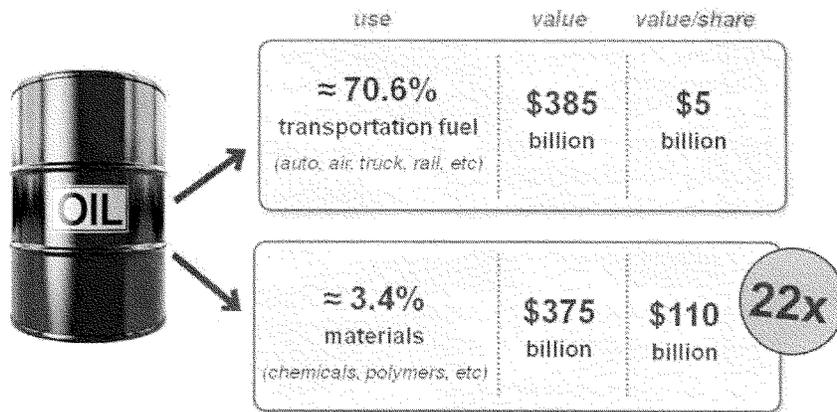
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Value-Added from a Barrel of Oil



Source: U.S. Department of Energy (2009), American Institute of Chemistry



Statement of Textile Management Associates and its Subsidiaries

to the

Committee on Agriculture, Nutrition and Forestry

Growing jobs in Rural America Hearing

Washington, DC

July 14, 2011

Good morning Chairwoman Stabenow, Ranking Member Roberts and all Members of the Committee. Textile Management Associates (TMA) and its subsidiaries that include: Universal Textiles Technologies (UTT), AstroTurf, Syntec, SynLawn, Global, ChemTech and my company, Signature Crypton Carpet, appreciates the opportunity to submit a statement to this hearing on growing jobs in Rural America through the utilization of bio based products.

I am pleased to report to you that our bio based products are used across the nation, including by Hospital Purchasing Service of Middleville, Michigan as well as on the Kansas Jayhawks baseball field.

Textile Management Associates currently employs 1,100 of the finest men and women in northwest Georgia and Alabama. Eight years ago the senior management team, led by Tom Peeples, Larry Mashburn and Doug Giles began exploring the possibility of utilizing bio based technology to replace existing petrochemicals used in the production of high performance backing systems. Through their exploration, they were lead to the United Soybean Board (USB) New Uses Committee, resulting in a new and dynamic partnership with America's farmers and their soybean checkoff. Through these efforts, the industry's first high performance backing system, "BioCel" was introduced, and has become a standard in the specified commercial carpet industry.

Our soy-backed carpets were one of the first bio based products listed by the U.S. General Services Administration. Thanks to the federal Bio preferred program that this Committee created in the Farm Bill, our bio based carpets are to receive preference for procurement in the 500,000 buildings that the U.S. government owns and operates. That is 3 billion square feet of space.

Today, "BioCel" can be found in some of the most prestigious installations in the U.S. including the U.S. Department of Agriculture and the U.S. Patent Office. Walk off matting systems by EcoPath are used at the Pentagon, Landscape turf by SynLawn, St. Louis Rams football field, the University of Cincinnati baseball field by AstroTurf and most recently, The Snow Lodge at Yellowstone National Park by Signature Crypton Carpet.

All totaled, UTT through its use of "Polyols" extracted from American grown soybeans, displaces millions of pounds of foreign dependent petrochemicals each year. By depending on U.S. agriculture, we are depending on U.S. chemists and chemistry. More importantly, the use of "soy" in BioCel backing technologies has shown no increase in costs, while at the same time increasing performance resulting in a cost neutral environmentally responsible solution for our customers.

Due to the success of BioCel, UTT has now made a tremendous investment to develop its own Polyol manufacturing facility, creating even more opportunity for employment in Northwest Georgia.

Over the past 4-5 years, the carpet industry in northwest Georgia has been hit hard with recent economic downturns, with unemployment rates hovering around the 12% mark for most of 2011. Through these tough times, TMA and UTT through its investment in new soy based technologies, have been able to grow its workforce by almost 10%. The trickledown effect of the increase demand of these soy based technologies, also adds value to the American farmer, while continuing to lessen our industry's dependence on foreign petroleum.

Growth of our line of bio based products reaches across America's economy. Carpet installers, landscape firms and many others realize business opportunities as our products are used from coast to coast.

Innovations like BioCel, often spur collaboration with others to create meaningful change. The USB introduced us to Mr. Jim Evanoff, Environmental Protection Specialist for Yellowstone National Park. Jim became concerned when he learned that over 43 tons of post consumer plastics taken out of Yellowstone National Park each season were being shipped out of the country. He felt that they needed to remain in the US, and be recycled by an American manufacturer for American consumers. UTT entered into an agreement with Yellowstone National Park, Four Corners Recycling, CPE, Inc. and the USB creating "Project Yellowstone" to take back all of Yellowstone's plastics utilizing them in our BioCel high performance carpet backing system. Recycled plastics have been utilized in our technologies for the past 8 years, with over 300 million bottles being diverted from America's landfills.

The guiding principles behind "Project Yellowstone" are to increase awareness to recycle in the United States. And further, by keeping 43 tons of Yellowstone plastics in the U.S., and recycling them back into carpet backing, we estimate that hundreds of jobs throughout the supply chain will be created.

Inspired by such innovation, my company, Signature Crypton Carpet has created a dedicated line of products celebrating the accomplishments of "Project Yellowstone". We sought out new fiber technologies by Aquafil USA resulting in a 100% recycled content nylon fiber system. When combined with BioCel, we now offer our customers the most environmentally responsible product in the commercial flooring industry that is 82% green by weight. Signature also realized that industry must also become more socially responsible as well. To that end, Signature formed a partnership with The Yellowstone Park Foundation to donate 50 cents per yard of all product sold back to the Foundation, to help protect and preserve one of America's most pristine natural resources.

We believe firmly that "if you always do what you've always done, you'll always get what you've always gotten". Job creation will be driven by new innovations inspired by the only perfect system on earth: "Nature". Through increased awareness and strategic partnerships, we can realize resurgence in our ability to lead the world in doing well, by doing good!

Thank you again for holding this hearing and the opportunity to submit our statement.

Respectively,

John McIntosh
Vice President of Sales

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First of all thank you Senator for the opportunity to speak with you here today. The creation of long term sustainable jobs in rural America is something I consider to be a personal mission in life and I have found this to be by far the most rewarding aspect of my own career. As a much younger scientist I came to the US from Scotland 27 years ago to work at MIT in Cambridge Mass. One thing led to another and I was very fortunate to help found a new company with two of my MIT colleagues. The company Metabolix will celebrate its 20th anniversary in June of next year. This company was formed with what was then a revolutionary vision and mission: “to use the emerging tools of genetic engineering to create a new chemicals and materials industry based on renewable agricultural resources.” This concept stemmed from a basic science project funded by the Office of Naval Research. At the time, the terms ‘industrial biotechnology and “synthetic biology” had not been conceived, oil prices were under \$20/bbl. We were effectively pioneering what is known today as the biobased products and bio-chemicals industry.

In thinking about what message I wanted to convey in today’s hearings, I came up with three with respect to jobs in rural areas:

- 1) Biobased products and chemicals have the potential to revitalize US based manufacturing and create large numbers of sustainable jobs in rural areas.

2) Continued government investment in Industrial Biotechnology Innovation and Research and Development for adding value to agricultural feedstocks is also crucial to long term sustainable job creation in rural areas.

3) The Government can facilitate deployment of this emerging industry in the US based on locally developed technology by creating demand pull through both policy and its purchasing power

To get back to my story, with the help of a few visionary investors, we worked on the technology in our labs in Cambridge often with Federal support in the form of grants as the Biopharmaceutical industry literally exploded into life around us. Cambridge is virtually unrecognizable today compared to when I arrived in the US. Today, our first production plant with a capacity of a 50,000 tons per year of a new bioplastic is in operation with our partner Archer Daniels Midland (ADM) in Clinton Iowa. The Clinton polymer plant has over 100 employees, with future expansion plans to quadruple this facility. I believe there were over 500 construction workers at the peak of plant construction.

Why Clinton Iowa, frankly there's not too much corn for feedstock in Massachusetts and ADM operates a very large corn wet mill in Clinton with enough infrastructure and sugar to supply the future expanded plant. This speaks to a fundamental advantage of rural areas in the emerging bioeconomy which is the

ability to supply renewable feedstocks for new production facilities based on technological innovation. Jobs move to the center of competitive advantage. The ADM Polymer employees in Clinton are a well trained, capable and very hard working team with a can-do attitude so typical of rural America in addition to having the feedstocks available for this new industry.

A compelling feature of biobased products is the downstream job multiplier effect. Based on this new bioplastic we have rejuvenated the plastics industry in Massachusetts, with our Telles Bioplastics Center and headquarters located in the revitalising industrial city of Lowell. Telles is the name of our joint venture with ADM. In a converted textile mill, we have 50 plastics scientists, engineers and commercial staff working on processing, applications development and sales of Mirel Bioplastics. These jobs are further multiplied by end-users or converters of the Mirel Bioplastic into products like bags, agricultural mulch film, and consumer goods like pens, flatware etc. Globally bioplastics are growing rapidly at over 20% per year with an almost unlimited potential.

The chemicals and plastics industries currently account for around 10% of all petroleum used with the global production of plastics last year being around 540 billion lbs with a net value around \$ 400 billion. Simply put, replacing a barrel of

oil to make higher value added biobased products and chemicals is as effective at reducing dependence on imported oil as biofuels.

The technical innovation developed in the US to make bioproducts is an opportunity for US to recapture its once dominant position in the plastics and chemicals markets. At its peak in the 1950s, the industry was responsible for over 5 million U.S. jobs and a \$20 billion positive trade balance for the United States. Jobs associated with the industry were typically among the highest paid in U.S. manufacturing. Over the last two decades, competitive advantage for chemicals and plastics manufacturing has shifted towards the Middle East (feedstocks) and Asia (growth and low cost labor) as has the industry. U.S. employment in the sector has dropped over the last decade and is projected to shrink further as capital investment for the petroleum-based industry has essentially shifted away from the United States.

Biobased chemicals and plastics represent a historic opportunity to reverse these trends through the creation of a new generation of renewable, sustainable products developed and produced in the United States. The United States and in particular rural America has substantial competitive advantages in available arable land and advanced agriculture and infrastructure. We can couple this with the leading innovative industrial biotechnology sector, an outstanding labor force and excellence in manufacturing. In addition we have the potential to use the existing

chemicals and materials infrastructure from the current chemicals and plastics markets. We basically have the makings of a powerful biobased products industry to revitalize manufacturing in this country. Even in its current early stages, the biobased products industry accounts for over several thousand direct jobs, and is likely responsible for over tens of thousands of jobs economy wide. Achieving the industry's full potential could create tens of thousands of high-paying green jobs in the United States within the next five years, the majority in rural areas.

As I stated earlier, Federal funding of innovative research and development is also crucial to maintaining and building on our advantages. The technology behind the success of the Mirel Bioplastics and the two other commercial platforms being developed by Metabolix was based in part on research funds from the federal government. Using only the bioplastics case, Metabolix translated less than \$5 million in Federal support into what is now over \$300 million in private investment based on the business merits .

Economic development impacts will include the creation of high-valued green jobs, an improved trade balance, the reduction of greenhouse gas (GHG) emissions and enhanced energy security through reduction of dependence on imported foreign oil. To foster growth of the biobased products sector in the

United States, federal policy should provide strong support for research, development and demand for innovative biobased products.

Testimony of Dr. Helen Sanders, of SAGE Electrochromics

July 14, 2011

Chairwoman Stabenow, Ranking Member Roberts, and members of the Committee, thank you for the opportunity to testify today on the role SAGE Electrochromics is playing in creating economic opportunity, and strengthening the green economy, in rural America.

My name is Helen Sanders. I have a doctorate in Surface Science from the University of Cambridge, in England. I serve as the Vice President for Technical Business Development for SAGE Electrochromics, in Faribault, Minnesota, located in rural Rice County.

I. SAGE Electrochromics

SAGE is creating glass for windows that go beyond the traditional idea that a window is simply a piece of glass in the wall. What is unique about our glass is that, using a technology called "electrochromics," it can be made highly tinted, or made highly transparent, or stopped at any tint level in between, all at the push of a button. In, this way it allows the right amount of light and heat to be admitted depending on the exterior environment and the needs of the building occupant. This reduces the load on the heating, ventilation and air conditioning (HVAC) systems, and improves occupant thermal and visual comfort.

At SAGE we like to think of windows as a high tech appliance in the wall that allows occupants to actively manage the amount of sunlight entering a building. This allows occupants to keep out excessive heat and glare without resorting to using shades or blinds, and so maintaining a connection to the natural light and the outdoors – which was why they put the window in the building in the first place.

SAGE is the world's leader in the commercialization of electrochromic, or EC, glass for buildings, supplying EC glass for commercial, institutional and residential windows. This EC glass provides daylighting and energy management solutions for a wide variety of buildings such as commercial offices, art galleries, museums, atria, religious buildings, high tech buildings, college dormitories and student centers, and health care facilities.

The Lawrence Berkeley National Laboratories found that by actively managing lighting and cooling, these "smart windows" could reduce peak electric loads by 20-30% in many commercial buildings, and potentially enhance human comfort and productivity by maintaining access to natural light.¹ The Department of Energy has determined that the use of EC glass in windows can save 10-28% of energy in most climate zones through reduced air conditioning demand and increased use of natural day lighting, making it a huge part of the energy efficiency equation. In fact, variable solar control, such as that provided by electrochromic glass, is one of the key building envelope technologies cited on DOE's roadmap to achieve Zero Energy Commercial Buildings in 2030.

II. Energy Efficient Upgrades to SAGE Facilities

SAGE has advanced the technology to the point at which it is expanding its manufacturing facility. The company is constructing a 300,000 square foot plant in Faribault, Minnesota, that has already created over 200 construction jobs, and will create about 160 permanent green jobs.

¹ E.S. Lee et. Al. "The Energy Savings Potential of Electrochromic Windows in the US Commercial Buildings Sector" LBNL 54966 4/30/2004. Lee et al. 2002. "Active Load Management with Advanced Window Wall Systems: Research and Industry Perspectives." *High Performance Building Systems*. http://buildings.lbl.gov/cec/pubs/E3_50855.pdf

The project is to be financed in part by a loan guarantee provided by the Department of Energy. Senator Klobuchar was instrumental in helping to secure that loan guarantee. Another element of the funding is a loan from our local electric cooperative, funded through a USDA loan program (similar to the RUS program that would be established by the bill Senator Merkley plans to introduce.)

The USDA financing provides a valuable contribution to this project. It will support the cost of energy efficiency enhancements to our factory, including, for example, the implementation of energy efficient lighting systems using T8 lights and dimmable lighting controls, which, in combination with the unusually large number of windows and skylights throughout the manufacturing facility, will provide natural daylight and offset the need for conventional electric lighting. In addition, the HVAC and chilled water systems will use free cooling from outside air, and there will be a hot water reclamation system from the compressed air equipment to provide plant heating. Waste and rain water reclamation systems are also going to be implemented for water conservation. As a result of these and other energy saving implementations, the energy performance of the facility is projected to be 28% better than the ASHRAE 90.1 baseline – a key national energy standard for commercial buildings today and SAGE will be pursuing Leadership in Energy and Environmental Design (LEED) certification for the building.

By constructing a plant that is as energy efficient as possible, SAGE expects to substantially reduce its air conditioning bill, in particular by reducing its cooling load during peak demand periods. By the use of large numbers of skylights and windows, SAGE will reduce electricity costs through utilization of natural daylight. The energy savings will be further increased when SAGE replaces the high performance triple silver low-e glass which will be

initially glazed in the windows with its own EC glass, after bringing the manufacturing plant on line. Incidentally, a side benefit of the abundance of natural daylight is happier, healthier and more productive employees – a benefit proven through numerous studies. Finally, by having a green building, SAGE will be better able to attract the absolute best employees.

III. Promoting Energy Efficiency Creates a Virtuous Cycle

Now that SAGE has been able to make these energy efficiency improvements, we will be able to make further investments in our company to make our product available at increasingly affordable prices to our customers, which will allow consumers to increase the energy efficiency of their buildings. The faster that SAGE is able to ramp down the manufacturing cost of this new innovative product, the faster the technology will be adopted in the market and the faster the nation can capture the significant energy savings potential in both new construction and in renovations of the existing building stock, and move closer to the goal of low energy or zero energy buildings.

Thank you for the opportunity to testify. I look forward to answering your questions.

July 11, 2011

United States Senate

Committee on Agriculture, Nutrition and Forestry

Testimony of Mr. Zac Stewart

Chairwoman Stabenow, ranking member Roberts and distinguished members of the subcommittee, thank you for allowing me to speak today regarding the proposed Rural Star legislation and its potential job creation impact in rural America.

I operate a small home energy retrofit business located in southwest Colorado. We are a full service home performance business which means that we conduct the initial energy audit and generate a recommendation report based on potential energy savings and then perform the repairs. We install windows, insulation and other related energy saving measures. I currently have three employees, and all three including myself were previously employed in the residential home building industry prior to the downturn in the housing market. We are experiencing a steady demand for energy efficiency repairs, but face the same challenges most markets face: access to capital.

For home performance programs to work a funding mechanism must be in place to meet the needs of the homeowners who want and need repairs but lack the money to proceed. In metropolitan areas there are large national home performance contractors that have the capital to offer financing to homeowners. In rural areas like southwest Colorado, we are made up of small home performance businesses that don't have the ability to offer financing to customers. Financing options coupled with existing energy efficiency incentives is the piece that we in the rural areas are missing, and I believe this would propel many homeowners to move forward with repairs.

The housing stock in the southwest is weathered and aged. Home repairs usually only take place when there is a "good year" or the furnace stops working and there is no other choice but to fix it. There is no shortage of homes that need to have energy efficiency upgrades completed. Our greatest challenge as a home performance company is converting the audit into repairs. I can perform energy audits and have the most talented salesman around but if the homeowner doesn't have the money to implement the recommended repairs we are back to square one. I routinely encounter homeowners that are taking advantage of rebates available for an energy audit but cannot proceed with any installed measures due to financial constraints. Rural Star benefits a homeowner by making their homes safer, healthier, and more efficient, and it benefits the rural contractors by increasing our workload.

It has been a pleasure speaking here today. Thank you for your time.

Testimony before the Senate Agriculture Committee

Marc Verbruggen

CEO and President, NatureWorks

July 14, 2011

Thank you Chairwoman Stabenow and Senator Roberts for inviting me to testify today. I am Marc Verbruggen, the Chief Executive and President of NatureWorks LLC, based in Minneapolis, MN the home state of committee member Senator Klobuchar.

I also want to recognize Senator Nelson. We have worked with him for many years, going back to his time as governor, to bring bio-based products to market. I also would like to thank Senator Johanns from Nebraska for his work with us as well. Our manufacturing plant is located in Blair, Nebraska. We employ about 100 people and are presently investing tens of millions of dollars to improve efficiencies and further expand our production capacity in response to double digit global demand.

This demand is creating jobs and spurring new product growth for our customers – from manufacturers in Ohio like Clear Lam and PolyOne to manufacturers in Michigan like Fabrikal – one of our biggest global customers. This is also supporting corn demand, as well as driving low carbon footprint packaging for leading US brands like StonyField Yogurt in New England and global retailers like Wal-mart.

More nascent, but of tremendous opportunity in Michigan, is the leading interest from auto companies in replacing the lightweight, performance materials in their cars with biobased versions. Ford Motor Company in particular is highlighting its interest and long term technology leadership in biobased materials including what it's already done with soy-based polyurethane foams – including some manufactured by our parent company Cargill.

Bio polymers represent an extraordinary sustainable manufacturing platform. While other industries may still be struggling, this industry is beginning to flourish globally, with high profile IPO offerings and Venture Capital investments.

According to a recent report Minnesota venture capital investing numbers in green chemistry are up for two consecutive quarters. For several years running medical technology has been the top funded sector, but green chemistry technology may be taking over. The medical technology industry in Minnesota has established roots, while the green chemistry space has taken to the state more recently. While most green chemistry companies in Minnesota do not

have the long history of NatureWorks, there is a growing renewable chemical cluster which fits nicely with venture capitalists looking to take part in the all important green economy. This tracks with national trends as well, with potential for all regions in the US to benefit.

Between 1997 -2003, the US trade balance in chemicals plummeted from a \$20B surplus to \$10B deficit. According to a recent jobs report issued by the Biotechnology Industry Organization ("BIO"), this Committee could help create over 237,000 direct US jobs in the sustainable chemistry sector, and help improve the balance of trade in the chemical sector. High value bioproducts could help turn around the job loss in the US chemicals industry. With the help of the Committee, US renewable chemical companies could capture a projected 19% of a new estimated \$1 trillion global biochemical market.

To illustrate, NatureWorks' one plant directly supplies over 50 manufacturing customers in the US, and there is a tremendous multiplier effect, as each of those manufacturers in turn, supplies their customer base, with the cascade effect rippling on through the channel to market. NatureWorks is proud to be part of this fast-growing sector in Minnesota, Nebraska, the US, and around the globe.

With that broad context of the renewable polymers and chemicals industry established, I'd like to talk to you about NatureWorks.

I want to recognize up front that the NatureWorks story you're going to hear – the development of this world class, sustainable manufacturing platform - was supported in part by an R&D grant from the Energy Efficiency and Renewable Energy Program within the U.S Department of Energy. This project, "Making Industrial Biorefining Happen" leveraged significant private investment to achieve efficiency and operating productivity.

NatureWorks LLC was the first company to commercialize a broad family of bio-polymers, derived from 100 percent renewable resources. We engineered and built the first ever large scale bio-polymer plant, with the required economies of scale to compete head-to-head with traditional oil-based polymers. Our proprietary PLA (polylactic acid) polymer, marketed globally under the Ingeo™ brand name, can today be found in a wide variety of applications, from rigid and flexible disposable packaging, to wipes, diapers, and, in blended form, in an ever increasing range of (semi-) durable products (gift cards, mobile phones, computer and copier housings). Global brands and retailers such as Coke, Pepsi, Danone, Nestle-Purina, Toyota, and Walmart have Ingeo products in their global portfolio.

NatureWorks is a typical representative of the broader bio-polymer and green chemical industry, and is proud to be a Presidential Green Chemistry Challenge Award recipient, in recognition of Ingeo providing a number of benefits, including:

- The carbon footprint of the industry's products, as demonstrated through a wide variety of third party Life Cycle Analysis, is 50% or less than of traditional plastics;
- Our products are 100% based on renewable resources, which are abundantly available in U.S., and as noted earlier, based on present feedstock economics, PLA can compete very well with disposable oil-based plastics such as Polystyrene and PET.
- The Ingeo PLA renewable feedstock requirement can be easily met domestically with materials such as starch from conventional corn. As a result, we create a highly valuable bio-plastics product, which is a tremendous addition of value for both our input suppliers and our customers.
- Additionally, Ingeo™ and other renewable polymers convey environmental benefits when the PLA waste gets composted or is re-cycled and reprocessed into new PLA products.

As to be expected from a "new-to-the-world" innovation, the journey to commercialize Ingeo™ has not been an easy one. Initial manufacturing plant yields were very low, manufacturers didn't really know how to work with the product, and frankly there wasn't much initial market demand. We were a bit ahead of the curve. As a result, NatureWorks suffered through a period of sizeable financial losses. Further, to commercialize a new plastic on a global scale required a large commercial organization, which had to be built from scratch and resulted in very high upfront annual expenses.

Thankfully, the last couple of years have seen a dramatic improvement in our operations – operating plant yields are now comparable with traditional plastic plants, consumers around the world have been driving the demand for "sustainable" plastics and global brands see the value in "low carbon" product launches.

The marketplace is now changing. During the economic downturn, not only did we survive, we continued to grow. Throughout the global recession, we grew on an annualized rate of close to 10 percent. We are now experiencing a year-over-year growth exceeding 30%. Our business fundamentals are in a much better place. Our customers are household names. Consumers and brands care, and we believe that growth will continue at a consistent high rate. Green chemistry and agricultural innovation in general, hold significant promise.

As it relates to the Congress, we would stress several important policy principles that can serve the sector well:

1. USDA BioPreferred: Maintain and expand USDA's successful BioPreferred consumer labeling program. NatureWorks is one of the first to be certified for the BioPreferred Program, and ClearLam - our Ohio manufacturing customer I referenced earlier, was the first manufacturer to get the entire packaging line which it supplies to Walmart, certified

“BioPreferred.” I thank the Committee for its leadership in creating BioPreferred, which has sent a strong message to the marketplace, and I urge increased support in the next Farm Bill.

2. Government support – incentives or tax benefits – should be predictable, stable and multi-year. Significant capital is required to build and operate large scale bio-polymer plants, some of them being “first-of-a-kind” and capital markets still considers the bio-polymer industry as carrying sizable risk. Consequently, only multi-year, predictable incentive programs will be seen as lowering the investment risk and assisting job creation.
3. Incentives should not be biased toward one type of product or feedstock versus another. Bio-based innovation projects should have equal access to any form of assistance the government offers. As an example, future bio-refineries will have economics similar to oil-based refineries, needing a balance of high volume and high margin (bio-plastics) products to be viable. At present, the US government does not recognize this required balance in its present incentive programs. The US should not walk away from America’s competitive advantage at corn dextrose and renewable oils during the transition to next generation technology.
4. Industry incentives should be competitively awarded. This ensures that projects are appropriately reviewed not only for the science involved, but also with an element of commercial viability.
5. Government should expect that private capital be a part of the equation. The pledge of private capital is a strong signal that those involved believe a project is promising. Government can and should support, but it should not be a disproportionate source of funding.
6. Policy and government involvement needs to be coordinated. We need the farm bill, bio-based incentives, and tax policy to be aligned, so that the commitment to green chemistry is well coordinated. Enactment of the Biobased Production Tax Credit, a priority for NatureWorks, though outside the jurisdiction of this Committee, would greatly enhance job creation and help this sector tremendously.
7. Government should work as hard to promote manufacturing investment as it does investing in innovation. Innovation is essential, but manufacturing investment and commercialization of products are the sources of jobs. Bio-polymer start-up companies face a number of investment hurdles, the largest one bringing “new-to-the-world” technology to scale. A number of private financing options exist to build pilot or demonstration plants but far fewer options exist to build a large scale plant. In the absence of US investment options, there is a material risk that plants will be built overseas and/or overseas industries will gain ownership of US bio-polymer companies. Other countries are offering significant incentives to lure this sought after renewable industry abroad.

Conclusion

I thank the Committee for its leadership in holding this hearing, and look forward to working collectively on the proposals discussed today. With a sense of urgency, the U.S. can capture a projected \$190 Billion of the \$1 trillion global renewable chemical market, as well as all the value chain jobs that go with this sector. However, the industry needs similar manufacturing-scale incentives that have been provided to other industries in their early stages such as those provided to the petrochemical, biofuels, wind, solar and other renewable industries – or the US will lose jobs and the historic opportunity to lead global sustainable chemical manufacturing.

The primary reason I am raising these principles is that the potential for bio-plastics such as Ingeo PLA is now recognized globally. While the U.S. is the world's most efficient producer of corn, there are other feed stocks that are a suitable substitute – most notably cane sugar or starches from alternative plants such as cassava. Multiple sugar- or starch- producing countries in Southeast Asia, Europe or South America are working hard to attract manufacturing investment that will benefit local farmers by maximizing their crop value and while creating high wage industrial jobs. One S.E. Asian country is now providing an incentive package containing a 15-year tax abatement for investors in the bio-plastic industry. Since the bio-polymer industry will come of age in the next 5 years, we believe it is a critical time for the U.S. to remain a strong base for innovation; but the US must remain equally focused on bringing these innovations to scale if it wants to be home to the manufacturing of these innovations.

Let me conclude by reiterating that the US is still on the forefront of bio-polymer technology, from enzymes to fermentation to chemical technologies. It is home to the best developed agricultural infrastructure, and the base of some of the largest agricultural and chemical companies in the world. It still has the largest plastics market. It has qualified labor and competitive energy rates. It is therefore uniquely positioned to benefit from the emerging bio-polymer industry, which will grow to a multi-billion dollar enterprise over the next decade.

In the end, only the marketplace will decide which innovations succeed. We are a firm believer that "green" plastics with economics tied to renewable resources will be one of the key growth drivers for the next decade, creating numerous "green" jobs tied to domestic feedstocks rather than imported oil. Where the U.S. government can help is to support innovation through competitively awarded research funds, and at this point probably most important, re-double efforts through tax policy to attract the manufacturing base that many other countries are now working so hard to get.

QUESTIONS AND ANSWERS

JULY 14, 2011

Senate Committee on Agriculture, Nutrition & Forestry
Growing Jobs in Rural America
Questions for the record
Paul Bony
July 14, 2011

Senator Debbie Stabenow

1. Obviously, our hope is that this initiative would increase demand for energy efficiency improvements for both homeowners and rural business owners. As that demand increases, that means you could be looking to hire new people. Do you believe our workforce has the training and expertise necessary to step into those new jobs as they become available? Will additional training be needed to help workers take advantage of these new opportunities?

Answer- For ClimateMaster, we have the capability to train both our manufacturing force and our network of equipment and geothermal loop installers. Our product installation process utilizes the basic skills of existing heating and air conditioning contactors and water well and other drillers.

Senator Pat Roberts

1. You testified that your company performed a study that indicated that 50% of the customers would have implemented energy efficiency upgrades had they had the financing. When was this study performed, and how many customers were included in your analysis?

Answer - This survey was conducted between 3/29/2011 and 5/12/2011. Our survey firm made calls to 1,163 individuals and obtained responses from 150.

2. How do you ensure that the savings you estimate from your audit are actually gained from the improvements?

Answer - ClimateMaster dealers are trained to use "GeoDesigner" to size the equipment and loop for our residential ground source heat pumps. This program also provides the consumer with a cost savings calculation. In the commercial market, several programs can be used by engineers and commercial project designers to calculate equipment sizing and cost savings.

We train our dealers to perform unit run tests to make sure our equipment is meeting its performance standards at start-up.

3. Why isn't private capital available to assist with financing RESPA?

Answer – There is some private capital available to fund energy efficiency improvements, but it comes at a high cost, is “clunky” in matching the customers’ decision to make home improvements with the loan process. For example, unsecured consumer loan programs offered in the Heating and Air Conditioning industry can be as high as 26% APR. There are high transaction costs and time barriers to obtaining secured financing at a lower cost. Consumers can grow frustrated with the process and loose interest in investing in energy improvements. The beauty of RESPA is that it brings the loan process into the audit recommendation process and provides consumers with affordable interest rates. The on-bill collection process also removes a key efficiency retrofit barrier consumer barrier by allowing consumers to tie their efficiency loans to their buildings removing their fear of funding retrofits that will benefit future owners at their current expense.

4. If RESPA were to become law, it would require funding to be fully implemented. Given our current budgetary situation, Congress will need to look for offsets to pay for this program. Would you provide us with suggestions as to where to find the funding for this program?

Answer - I can offer two suggestions. The first is to reduce subsidies to the oil and gas industries equal to the amounts provided to the efficiency industry. This would level the playing field between extraction and efficiency. The other would be to allow this program to operate at the cost of treasury financing plus a small “mark-up” to cover the administrative costs of the program, as the RUS does with utility financing. This would still bring much needed capital to the efficiency market while taking the program off budget.

Senator John Thune

1. If greater loan availability would be in place making it easier for homeowners to purchase geothermal or other energy efficient systems for their homes – do you anticipate a rise in the cost of the energy efficient systems due to the increased demand?

Answer – It is our experience that the contrary would occur. As markets for our product grow, competition and contractor economies of scale bring prices down.

2. If the loans were in place that this legislation authorizes what percentage increase in your business do you anticipate?

Answer – If the legislation is approved and fully implemented by the participants we would expect at least a 10% annual increase in our business over our current forecasts.

Senate Committee on Agriculture, Nutrition & Forestry
Growing Jobs in Rural America
Questions for the record
Mr. Bruce Graham
July 14, 2011

Senator Debbie Stabenow

1. I would like to focus on the potential new administrative costs that the electric cooperatives would see if they participated in this kind of program. You mentioned that the electric cooperatives already have established billing systems that would allow the consumer to repay their loans on their electric bills and that the electric cooperatives already have centralized data and billing operations that will allow them to track energy usage before and after the installation of energy efficiency upgrades. Given that these things are already in place, would there be substantial new administrative costs for the cooperatives?

While most rural electric cooperatives already have established billing systems in place that will aid in the implementation of the rural energy savings program, we will still see substantial overhead costs that will not be fully covered by the allowance included in proposed legislation and will require a strong commitment on the part of cooperative boards.

Most efficiency programs that are currently in place across the country are not very labor intensive. Rebate programs for the installation of energy efficient appliances are common and involve verification of installation and processing of a rebate check. With RESPA, the energy efficiency measures that are effective will vary by region and perhaps by state. In each case, an energy audit is the first step, which will require an increase in auditors and audits. Individual loans will be made to consumers, and in many cases, a loan-making and servicing function may be established at the cooperative for the first time. While billing systems may be in place, there will be additional costs to administer the program at the co-op level and the amount of those costs will be directly proportional to the size and success of the program. Such additional costs include: contractor certification, contracting, measurement and verification, and program promotion.

2. Mr. Graham, in your testimony you made the important point that the rural electric cooperatives do not own the homes and businesses where the energy efficiency upgrades would be made – your customer would need to request these upgrades. So, the success of an initiative like the Rural Energy Savings Program would in part depend on some degree of outreach. Can you describe some of the

outreach techniques that the cooperatives might employ? You mention an energy efficiency program provided by Hoosier Energy. Can you describe some of their outreach efforts that they found successful?

Electric Cooperatives are fortunate to enjoy an extraordinary communication level with their consumers. Most have monthly publications that are sent directly to the member. Many are establishing electronic communication links with their members through traditional e-mail as well as facebook and twitter. Electric Cooperatives have Annual Meetings, Regional Meetings, Member Advisory Councils and an enthusiastic workforce that helps to spread the message about new programs and services. Most have professional communicators on staff who are adept at public relations efforts to get media attention for innovative programs such as this.

In addition, other witnesses testified that an effective way of promoting this program is to work with the local contractors. This program will help contractors secure additional business by making the energy efficiency improvements affordable and effective and they will serve as excellent program ambassadors.

Senator Pat Roberts

1. We have received a few mixed reviews from cooperatives in Kansas about the Rural Energy Savings program. This is probably a question that should be directed to USDA RUS but in their absence I will ask you for your thoughts. This legislation would require USDA RUS to administer a \$760 million program with existing resources. In other words, there is currently no new money to administer this program. In the absence of funding, do you have concerns that this legislation would create more stress on RUS and would detract RUS from their main mission - providing loans to increase electric generating capacity?

Senator, as you indicated, this is a question that should be directed to the RUS, as I cannot speak for them.

It is NRECA's understanding that the Rural Utilities Service currently operates a \$7.1 billion loan program with very limited resources. It is also NRECA's understanding that while a new \$760 million energy efficiency program would put additional stress on current RUS resources, the program would serve a critical purpose and at a level that is not achievable today.

Energy efficiency needs to be a part of RUS's main mission, but that currently isn't cost-effective or feasible. RESPA would reduce the lending cost relative to traditional RUS loans, making energy efficiency loans affordable for consumer members as part of RUS's main mission.

2. If the bill were to become law, it would require funding to be fully implemented. Given our current budgetary situation, Congress will need to look for offsets to pay for this program. Do you have any suggestions where to find the funding for this program? There are a number of programs at USDA and Department of Energy that incentivize energy efficiency projects. Would you prioritize current programs, which ones are less important, and could be cut to provide money for this one?

We would be willing to work with Congress on finding the appropriate offsets for the authorization of the RESPA program.

Although efficiency investments have always been part of the culture of the electric cooperatives and part of the RUS mission, the authorization of efficiency loan programs under Section 6101 ("Energy Efficiency Programs" in the 2008 Farm Bill) recognized that efficiency investments are a part of providing electricity services to consumer-members of RUS borrowers. However, the RUS loan program is usually oversubscribed, and serves the purpose of providing loans for our infrastructure that provides electricity to our consumers. As also stated in question one, energy efficiency needs to be a part of RUS's main mission, but currently isn't cost-effective. RESPA would reduce the lending cost relative to traditional RUS loans, actually making energy efficiency loans feasible as part of RUS's main mission.

3. I would like to know more about the loans under this program. You testify that the loan will remain with the house or permanent structure. What happens when homeowners or small businesses who are participating in the Rural Energy Savings Program default on their residential or commercial loans? In other words, customers who are awarded a loan to make energy efficiency improvements subsequently default on their mortgage, and the bank then seizes the real property. Who is responsible for paying off the RUS loan? Will USDA RUS have a lien on the house or real property in this case? Can you explain that process?

It is our intent that the obligation for the rural energy savings program loan stays with the meter, so as long as the house is occupied and the meter is turning, the

owner will be paying their electric bill. If the resident does not pay their electric bill, the service is turned off. So, if there is a mortgage default, someone eventually moves into the house and the utility service is resumed. The new owner will enjoy a lower energy bill and thus may continue paying on the RESPA loan. Importantly, the cooperative will absorb all risks for consumer repayment of their efficiency investments.

4. Please elaborate on what existing rebates are available for homeowners and small businesses who want to make energy efficiency improvements and why these rebates are not sufficient incentives to jump start this market?

Rebate programs are generally limited in scope and often target the replacement of old inefficient appliances, incentives to remove second refrigerators, etc. They are usually small dollar amounts and generate results by picking the "low-hanging fruit." The RESPA program is designed to help members turn "audits into action." Often when a consumer requests an energy audit, the potential savings can be dramatic but it takes a significant up-front investment. Many consumers can't afford the initial cost, even though they can see that in several years, the projects will pay for themselves and generate long-term savings. The programs are entirely different and RESPA fills this identified need with a forward thinking program.

5. How do you ensure that the savings that are gained from the energy efficiency improvements are greater than the cost of the loan?

Trained energy auditors will conduct audits to determine which types of energy efficiency improvements are warranted. These will vary by region and may include duct sealing, insulation, HVAC systems, heat pumps, boilers, roofs and other improvements that the utility has demonstrated to RUS will produce sufficient savings. The program will preclude efficiency technologies that are not proven and cost-effective within a ten-year period. Because cooperatives are on the hook for paying back the loan, there is a huge incentive to make sure that these savings occur, and the consumer-owner realizes the value promised.

6. Explain what happens if a customer using RESPA stops paying his/her power bill?

Cooperative customers have an excellent record of payment, with a national average of less than 0.4% uncollectable bills. However, if a customer who has

taken on a RESPA loan through their cooperative stops paying their power bill, the cooperative will turn off the electricity until payment is resumed, as is currently the case. The loan stays with the property so even if a consumer stops paying and sells the property, the new purchaser will assume the loan and the benefit of the energy efficient improvements. If there is no new consumer, the cooperative pays the loan within the original ten-year term.

7. What type of participation level do you expect among cooperatives? How many cooperatives are currently operating or administering a similar type program?

Participation levels are difficult to predict. Currently, there are only a couple electric cooperatives that I am aware of operating this type of program -- one is Midwest Energy in Hays, Kansas. We believe that a national program will have a better chance for success. Rather than each electric cooperative developing innovative but separate programs such as Midwest's How\$mart, a national program could be administered and promoted much more efficiently.

According to our estimates, 1.6 million households will be able to participate in the program if the average consumer loan is \$3,000, and 1.1 million households will be able to participate if the average loan is \$4,500. These estimates are based on data from South Carolina cooperatives' rural energy savings program proposal. These numbers are directly dependent on the funding level and interest rates -- the lower the funding level or the higher the interest rate, the lower the amount of participation in the program.

8. Has your association performed studies on how many jobs would be created if RESPA is enacted, and if so, can you provide a summary of that report or reports?

By the end of 2012, a program authorized at \$760 million would support an estimated 13,000 to 27,000 jobs that would not otherwise be present in the economy. These jobs will increase in number each year while efficiency improvements are being made in consumer homes and businesses and then sustained over the long-term by the economic activity generated by the energy savings from these investments -- increasing to more than 157,000 job-years over the 10-year program.

The job impact estimates are based on an economic analysis conducted on behalf of the South Carolina Co-ops. This study examined the benefits that would accrue to the state of South Carolina if such a program were enacted. Applying the results of the SC analysis to a broader national program assumes getting similar employment effects and energy savings per program dollar.

The South Carolina study found that co-ops would have to increase their staffing levels to support the program. In addition, the loans would have direct employment effects as contractors are hired to do the work. Indirect and induced jobs - brought-on by multiplier effects - are created as contractors purchase supplies for 2nd and 3rd tier suppliers and as a portion of their incomes are spent in the local economy. Importantly, additional jobs in the community will be generated by the spending of newly created energy savings for cooperative members.

9. Are most cooperatives structured in a way that they can lend? How many will need to hire new staff or train existing staff to handle the loan process?

Consumer loan programs are rare at electric cooperatives. There will need to be new procedures, training and possibly new staff to administer those programs. Servicing loans could be more efficiently aggregated between several cooperatives, through state or regional affiliates such as their statewide association, their generation and transmission cooperative, through an affiliated credit union, or a loan processing company. These arrangements are possible under the proposed legislation.

Senator John Thune

1. Would you say that the Rural Energy Savings Program could possibly be a disincentive to existing loan programs electric cooperatives have in place to consumers and remove incentives to create new non-government programs?

Some cooperatives are able to provide efficiency services within their own programs, but up-front costs for consumers remain the major impediment to most-existing non-government programs. This is the case for energy efficiency services even if the costs will be recovered through efficiency savings in the long run, or through tax credits or rebates. It is expected that RESPA, by providing the funding to install these efficiency measures and then produce most of the repayment from the energy savings, will reach consumers who aren't otherwise financially able to access rebates or other such programs.

2. In this light of the current U.S. budget and deficit, how do you justify growing the federal government's role within this legislation?

A main goal of the Rural Energy Savings Program is to reduce the need for expensive investment in new electric infrastructure, while supporting the obvious job-creation for contractors and equipment manufacturers. Rural electric cooperatives have far less revenue than the other electricity sectors to

support a greater share of the distribution infrastructure. We believe it would be a win-win to be able to help consumers invest in energy efficiency improvements for their homes and small businesses so that they can save on their energy bills, while also helping cooperatives avoid the long-term costs of building new infrastructure.

This is a voluntary loan program. There is little growth in government that will result from this program and there is little or no risk for to the government related to the return of those loan funds. The program will create jobs as a result of the government's investment in this initiative. The federal government's role is justified as an extension of the repeated precedent for encouraging energy efficiency through incentives such as the tax code.

Senate Committee on Agriculture, Nutrition & Forestry
Growing Jobs in Rural America
Questions for the record
Mr. Dennis Hall
July 14, 2011

Senator John Thune

1. What do you see as the greatest challenge to the growth of biobased products right now?

During the past 100 years, our country made investments in converting cheap oil into an amazing variety of very high quality petro-chemicals. We need to explore opportunities for similar investment in converting biomass into high value, renewable materials. Two suggested are provided below:

- 1) Targeted enforcement of BioPreferred legislation that requires the federal government to purchase biobased products when comparable in performance and price will drive rapid adoption. Assistance may be needed by small companies with ability to scale-up to meet larger orders.

- 2) Investment in **research that is aligned to industry needs**. By beginning with market needs, bioproducts can be a vehicle for innovation, international competitiveness, and job growth. The Ohio Bioproducts Innovation Center has developed a set of business-savvy services to accelerate commercialization. The process requires development of a reliable supply chain, support in overcoming technical barriers, seed funding to lessen the risk experienced by potential customers, and financing through commercial scale-up. A cluster of research and industry collaborators that share an interest in the new bio-based material is key to business success.

2. What do you think needs to be included in the upcoming Farm Bill to further spur the growth of biobased products?

Biobased materials have not been a priority by the federal government even though they have per unit value many times that of energy or transportation fuel. One issue has been jurisdictional between USDA and US DOE. The Farm Bill needs to claim bioproducts as an agricultural enterprise and then secure federal funding to accelerate research and development of this still nascent industry.

From my experience, there are few programs that target bioproducts. The Biomass Research and Development Initiative (BRDI) seems like a model program, but is under-funded. Biorefinery demonstration programs need to include a new emphasis on high-value, bio-based materials.

With the possible exception of long-term academic research, the economic impact will be much greater if bioproduct R&D is a collaborative endeavor that involves the for-profit, business community with university and other non-profit research centers.

Senate Committee on Agriculture, Nutrition & Forestry
Growing Jobs in Rural America
Questions for the record
Mr. John McIntosh
July 14, 2011

Senator Pat Roberts

1. The development of new biobased products can clearly benefit feedstock crops. You seem to have developed a positive relationship with the United Soybean Board utilizing soybeans as your feedstock. Investing in new uses for commodities is an important role for check-offs. How did you become involved with the United Soybean Board and what role did they play in the development of BioCel?

Universal Textile/Signature Crypton Carpet has worked with the New Uses committee in the education of different market segments of the availability of soy technology. The USB has introduced our team to the farmers who are entwined into the churches, local government and business community across America. In doing this introduction with marketing synergies it have been extremely cost efficient and successful. This is the key component in the assistance of the USB. The partnership has grown into one of mutual inspiration, each finding new customers to purchase products utilizing these technologies. We can have the most amazing technologies in place, but if no one sees the value/solutions in their businesses, it's not effective.

Senator John Thune

1. What do you see as the greatest challenge to the growth of biobased products right now?

The commitment for the purchasing level does not currently meet the commitment made at the senior levels. We need to have more support from the purchasing sector. Education will play a great role in this effort. Also, partnerships with leaders like Yellowstone National Park, will create the kind of awareness we need to move others to biobased solutions.

2. What commodity crop do you see as having the most potential to produce biobased products? Do you see that changing?

We see Soy being the leader; however, the demand from China is forcing us to look at other options.

Senate Committee on Agriculture, Nutrition & Forestry
Growing Jobs in Rural America
Questions for the record
Dr. Oliver P. Peoples
July 14, 2011

Senator Pat Roberts

1. Your testimony references federal research funds that supported the development of several of your products. Please elaborate on the programs and funding that was used and how you benefitted from this assistance.

Senator, Metabolix, was founded on technology developed in the Department of biology at MIT with research funding from the Office of Naval Research. The company, founded in 1992 has also been the recipient of a number of additional Federal Research grants. The first from the Department of Energy Office of Biomass for \$7 million was instrumental in assisting the company to scale up some of the technology innovations which led ultimately to the joint venture with ADM called Telles to manufacture and sell the mirel family of bioplastics with the creation of a large number of jobs. In 2007 we received a \$2 million research grant from NIST to develop renewable routes to chemical intermediates which we are now in the process of commercializing. In June we were awarded a \$6 million grant from the DOE under the BRDI program to develop an advanced technology to produce large volume chemicals from engineered biomass crops like switchgrass which can be cost advantaged over petroleum based products with oil at \$40/barrel. This potentially disruptive technology has the potential to change the game for low cost renewable chemicals and enable broad deployment of advanced biorefineries with farmers as co-investors. At scale this new industry will be economically advantaged without the need for subsidies, generate thousands of jobs in rural areas and positively impact the balance of payments. So Metabolix is a great example of a very effective innovative company leveraging basic research funding to enable private investment and create long-term rural jobs.

Senator John Thune

1. You stated in our testimony that biobased products reduce our dependence on imported oil, could you tell me how cost-effective this is at the present?

Answer: Senators, like most new technologies there is a range of answers depending on what material we are discussing. In some cases biobased products have cost parity or a slight cost advantage over their oil based counterparts. I believe that this is the case with some of the soy based materials which was described by one of the other speakers on the panel. These are used in car seats and carpets. In others the biobased product brings new functionality which enables different applications or ways of doing business. Our own product the mirel bioplastics are biodegradable in a very wide range of environments

including oceans, rivers, sewage systems, compost and anaerobic digester facilities. So mirel bioplastic enables the use of biodegradable plastic for seedling planting to restore sea grasses and help restore the Chesapeake bay. Agricultural films produced using mirel eliminate the need to collect the film after use and dispose of it in landfills providing an overall system cost reduction. Finally mirel bags have the strength and toughness of petroleum plastic bags but can be used to collect organic waste from households for conversion to biogas in anaerobic digestion facilities.

2. What do you think the plastics and chemicals manufacturing industries need to shift manufacturing back to the United States/

These industries have declined in the United States for a variety of reasons including lower cost feedstocks at the well head in the Middle East, lower capital and labor costs in developing markets in China and India and in some cases environmental regulations. The United States agricultural resource can provide the feedstock but we must continue to invest in advanced innovative technologies to convert biomass to chemicals. We have an excellent labor force in the rural areas looking for opportunity. Finally regulatory processes need to be based on sound science. Exporting jobs to other parts of the world based on the agendas and activities of NGOs may be good for the NGO business but for many hard working rural Americans having a job that enables them to raise a family seems to me to be more important. Last but not least the United States is a very large if not the largest market for plastics and chemicals but demand for biobased products is greater in other parts of the world, in particular the European Union. By helping create demand at home the Federal government can greatly facilitate the establishment of this industry create thousands of jobs, reduce imports and position the US as a major exporter of renewable products for the future. The Middle East, China and India simply can't compete in renewable feedstocks.

Senate Committee on Agriculture, Nutrition & Forestry
Growing Jobs in Rural America
Questions for the record
Dr. Helen Sanders
July 14, 2011

Senator Pat Roberts

1. Will customers be allowed to choose any contractor to implement their energy efficiency upgrades? Explain how that process works once a customer has an audit performed and is ready for improvements to be performed. *I understand the legislation has been drafted to provide flexibility that allows the cooperatives to structure arrangements with their members in ways that are suited to local economic and business conditions.*
2. What is the cost of your windows that you manufacture? *The units we ship cost between \$60 and \$75 per square foot in commercial applications. When glazed into a frame, the finished window units are comparable to the cost of low-emissivity windows combined with automatic blinds and exterior sunshades. Can you provide examples of buildings that are using Sage glass? The glass will soon be installed in the Visitors' Center at the Washington Navy Yard in Washington, DC. In your testimony, you cite a Department of Energy study that indicates that this technology provides 10% to 28% of energy savings in most climate zones. What climate zones are those? The study was performed in Phoenix (hot and dry conditions in which the cooling load is the critical factor), Washington, DC (composite climate with heating and cooling seasons) and Minneapolis (cold climate, heating load is most critical). These three areas cover the range of energy savings that could be achieved in continental United States.*
3. You mention in your testimony that there are other funding sources that this industry can benefit from such as a Department of Energy loan guarantee program and USDA loan program. Why are cooperatives or other rural customers unable to utilize these programs as you have to implement energy efficiency standards? *It is my understanding that USDA loans are available to cooperatives and other rural customers, but I am not an expert in the technicalities surrounding these programs.*
4. Once you lower your operational costs, build adoption in the market place, and increase jobs as you testified, do you estimate the cost of these window will

decrease and if so by how much? *Our manufacturing costs will indeed be lower when the new plant is operational, by more than 30%.*

5. If RESPA were to become law, it would require funding to be fully implemented. Given our current budgetary situation, Congress will need to look for offsets to pay for this program. Would you provide us with suggestions as to where to find the funding for this program? *One source of funding offsets could be revenue expenditures that are currently in the tax code for mature energy producing sectors.*

Senator John Thune

1. Do you think there should be a means test to determine eligibility for government loans for energy efficient products, such as the windows your company manufactures? *A means test would reduce the number of people eligible to participate in a loan program and thus make the investments that the program seeks to spur, which would result in less economic impact. In addition, restricting the program to lower-income consumers may increase the risk of the government's loan portfolio.*

At the heart of this question is whether a loan program provides a subsidy for people to take actions that they could or would take without that subsidy. In the case of the USDA loan that SAGE received to upgrade our business's energy efficiency, it allowed us to make an investment that we may not have made otherwise, or at least would have postponed for a few years.

2. In your testimony you state the USDA financing provides a valuable contribution to making you plant more energy efficient. Does this financing coupled with reduced energy costs decrease the cost of the products you manufacture to the consumers who purchase them? In other words does it contribute to your bottom line, alone, or are savings passed on to consumers? If so, how? *The savings will be passed along to our customers.*

Senate Committee on Agriculture, Nutrition & Forestry
Growing Jobs in Rural America
Questions for the Record
Zac Stewart
July 14, 2011

Senator Debbie Stabenow

1. What kinds of improvements do you think your customers will be most interested in if this loan program becomes available to them? What are some of the energy efficient improvements people make today if they could afford the up-front cost? *The most common repairs are attic insulation, furnace replacements, and window replacements. Due to the high cost of window replacements and furnace upgrades many homeowners cannot afford to proceed with those repairs.*
2. Obviously, our hope is that this initiative would increase demand for energy efficiency improvements for both homeowners and rural business owners. As that demand increases, that means you could be looking to hire new people. Do you believe our workforce has the training and expertise necessary to step into those new jobs as they become available? Will additional training be needed to help workers take advantage of these new opportunities?
I believe there is already the trained workforce in place in rural areas. Over the past two and a half years with the increased funding by the American Reinvestment and Recovery Act, the United States Department of Energy's, Weatherization Assistance Program (WAP) has been actively training a green workforce throughout the country. The wonderful part about WAP is that it serves every county of every state in the nation, therefore, even in the most remote rural communities there are individuals and contractors that are trained in energy efficiency work. The harsh reality that will be coming our way is the ARRA funding levels will be ending and the massive ramp up in WAP staff, equipment, and training will lead to layoffs. The employees that have been working in WAP are excellent, well-trained personnel that would be an asset to a business like mine. I believe that a rural savings program would lead to hiring by contractors like myself, but it could also allow WAP agencies to operate a for-profit portion of their business and retain the employees that they currently have.

Senator Pat Roberts

1. I would like to know more about your business. How many energy audits do you perform annually? How do you ensure that the savings you estimate from your audit are actually gained from the improvements?
Annually I perform between 70 and 100 audits. When an audit is performed we run computer energy simulations in conjunctions with a utility bill analysis. The

utility bill evaluations allow us to “true up” our model and accurately assess where the home is using the most energy. If we know where the energy is going and at what rate, we can give an accurate savings estimate based on the new improvements that can be installed. To ensure that we deliver on the savings that we estimate it all depends on the accuracy of the audit and the utility bill analysis.

2. How will we ensure that auditors are following the same standards? Who will train the auditors and how will that be funded? What measures or controls will be in place to prevent auditors from recommending products they (the auditors) could directly or indirectly benefit from? Can an auditor also be a contractor as well? What measures are in place to prevent a conflict of interest?

To ensure the auditors are following the same standards a national accreditation entity such as Building Performance Institute (BPI) would need to be the criteria for anyone performing the audits.

Currently auditors are receiving BPI training throughout the country. There are numerous national companies that offer training, as well as local companies such as myself that offer BPI training. In addition, many community colleges are offering BPI training and scholarships. Here in Colorado we received two separate grants from the US Department of Energy for green job training and two of the community colleges are administering training throughout the state.

I began doing this work in Phoenix, Arizona partly because the local utility had in place a very good energy efficiency repair rebate program for homeowners to participate. The criteria for contractors to participate was to be BPI certified, this propelled me to pay for the training myself and become a BPI certified professional. I believe that there will be interest in a rural energy savings program that will drive contractors to seek and pay for the training without any assistance if needed in order to participate in the program.

I believe there needs to be a program sponsor that is well versed in energy efficiency repairs and building science to prevent auditors from recommending products that directly or indirectly benefit them. The program sponsors will need to review the audit and proposal for any loan to move forward.

Yes an auditor can be a contractor. I believe an auditor/contractor serves the homeowner very well because they know exactly what they want done and what it will take to get it done to achieve the predicted savings. I have experienced the difficulty that homeowners have when they receive an auditor's recommendations report and then contact contractors to perform all the repairs, often having to schedule multiple contractors to get the job done.

In order to prevent a conflict of interest the program sponsor must perform evaluations of the work and audit. For example the Arizona utilities operate a rebate program for energy efficiency repairs and have a non-profit group act as the program administrator. The non-profit group performs a paper review of 100% of jobs and field audits of 15% of all contractors jobs.

3. You mentioned in your testimony that you need additional funding for the cooperatives to market this program. How much money will be needed for this purpose?

I would not be able to give a very well informed answer to this question as I am unsure of the marketing costs beyond the small marketing that I perform. I do believe it needs to be a significant amount of marketing.

4. If RESPA were to become law, it would require funding to be fully implemented. Given our current budgetary situation, Congress will need to look for offsets to pay for this program. Do you have any suggestions as to where to find the funding for this program?

I am not familiar with all of the budget workings; however, my first thought would be to end subsidies and tax loopholes for oil, gas, and coal industries. Not only would RESPA save American families money that can be spent elsewhere in the economy it would decrease our dependency on fossil fuels.

Senator John Thune

1. Do you believe federal funding is the best source of capital for loans that improve home energy savings?

In the absence of private lending at this time I do believe that the government does have a compelling interest in funding energy savings loans. The amount of loans that are being issued by private banks are not enough to create major job growth. Loans for energy repairs have a much greater impact on the nation than a loan to remodel a kitchen. When those homeowners who perform energy repairs lower their monthly utility bill they spend the saving elsewhere in the economy. This is not a one time savings, this happens every month and compounds.

2. Do you think it is wise to grow the federal government's role in home improvement through these proposed loans?

Home energy repairs have a three prong benefit; reducing the US dependency on foreign oil, protecting the environment, and creating jobs. I do believe it wise to grow the federal government role to support a rural energy savings program that would benefit Americans on many different levels.

Senate Committee on Agriculture, Nutrition & Forestry
Growing Jobs in Rural America
Questions for the record
Dr. Marc Verbruggen
July 14, 2011

Senator Pat Roberts

1. The success of NatureWorks is an impressive example of growth and expansion. With a year over year growth exceeding 30% as you state in your testimony, you appear to have established an expanding market for your products. Keeping in mind that we are developing the next Farm Bill under tighter budget constraint than the last two bills, based on your experience and success, what is the most critical area of the technology and product development process where the federal government can provide assistance?

ANSWER: Probably the most important assistance the new Farm Bill can offer is continuing (and possibly strengthening) the USDA BioPreferred program. This program offers two significant benefits for the emerging bio-polymer industry:

- a. The labeling program allows US consumers to make an educated choice between regular and bio-plastics. Up to now it was often impossible for consumers to identify bio-plastics since they look identical to oil-based products. It is important for the industry to include in the Farm Bill appropriate funding for the USDA to support and strengthen this BioPreferred label program.
- b. The federal procurement preference for bio-polymers under the USDA BioPreferred program should be strengthened by adding more bio-based products to the program and by strengthening the compliance portion of the program (e.g. by having government departments reporting on implementation rates and/or by including purchasing specifications that include bio-polymers).

Senator John Thune

1. What is the greatest challenge to producing biobased products today?

ANSWER: The biggest challenge remains the competition in the global market place against oil-based polymers with their established economies of scale, developed over a 50+ years time period. Direct and indirect customers (e.g. converters, brand owners) as well as consumers are only willing to pay a marginal premium (< 10%) for sustainable products (with lower carbon footprint, based on renewable resources, with superior recycling) so, unless legislation (e.g. carbon tax, foam bans, plastic bag bans, recycle tax) drives behavior, emerging bio-polymer companies need to compete head-to-head with very large chemical companies. NatureWorks, thanks to its existing economies of scale at its Nebraska plant, has been able to compete with traditional plastics once oil prices approached \$80/barrel but most of my colleagues have far smaller operations lacking scale to be price competitive. The capital required to get the appropriate capacity is very high and financing (whether private or public, equity or debt) remains problematic.

2. What would you like to see included in the upcoming Farm Bill for the biobased products industry?

ANSWER: Probably the most important assistance the new Farm Bill can offer is continuing (and possibly strengthening) the USDA BioPreferred program. This program offers two significant benefits for the emerging bio-polymer industry:

- a. The labeling system allows consumers to make an educated choice between regular and bio-plastics. Up to now it was often impossible for consumers to identify bio-plastics since they look identical to oil-based products. It is important for the industry to include in the Farm Bill appropriate funding for the USDA to support and strengthen this BioPreferred label program.
- b. The federal procurement preference for bio-polymers under the USDA BioPreferred program should be strengthened by adding more bio-based products to the program and by strengthening the compliance portion of the program (e.g. by having government departments reporting on implementation rates and/or by including purchasing specifications that include bio-polymers).

Beyond assistance in the new Farm Bill, a production tax credit for renewable chemicals could help address the economies of scale issue highlighted above, and encourage growth here in the U.S. rather than abroad. As I testified, other countries are offering significant incentive packages to renewable chemical and bio-polymer companies, putting the U.S.

at a competitive disadvantage to capture jobs from this sector. I thank you for your leadership on both the Agriculture and Finance Committees, and stand ready to assist in anyway possible.

