

**ON-FARM ENERGY PRODUCTION: IMPACTS ON
FARM INCOME AND RURAL COMMUNITIES**

HEARING

BEFORE THE

SUBCOMMITTEE ON COMMODITY EXCHANGES,
ENERGY, AND CREDIT

OF THE

COMMITTEE ON AGRICULTURE
HOUSE OF REPRESENTATIVES

ONE HUNDRED SIXTEENTH CONGRESS

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CONTENTS

	Page
Brindisi, Hon. Anthony, a Representative in Congress from New York; submitted statement on behalf of Dairy Farmers of America	64
Conaway, Hon. K. Michael, a Representative in Congress from Texas, opening statement	6
Peterson, Hon. Collin C., a Representative in Congress from Minnesota, opening statement	5
Scott, Hon. Austin, a Representative in Congress from Georgia, opening statement	3
Submitted article	63
Scott, Hon. David, a Representative in Congress from Georgia, opening statement	1
Prepared statement	3

WITNESSES

Falk, Jim, President, Falk's Seed Farm, Inc.; Co-Owner, Falk Farm, Murdock, MN; on behalf of Minnesota Farmers Union, National Farmers Union	8
Prepared statement	9
Submitted questions	65
Sievers, Hon. Bryan J., Owner, Sievers Family Farms; Chief Operating Officer, AgriReNew; Vice Chair, Board of Directors, America Biogas Council, Stockton, IA	11
Prepared statement	13
Submitted questions	67
Harris, Will, Owner, White Oak Pastures, Bluffton, GA	22
Prepared statement	24
McCloskey, D.V.M., Michael J., Founder and Chairman, Fair Oaks Farms; Owner/Partner, Prairies Edge Dairy Farm; Chair, Environmental Issues Committee, National Milk Producers Federation, Fair Oaks, IN	43
Prepared statement	45

ON-FARM ENERGY PRODUCTION: IMPACTS ON FARM INCOME AND RURAL COMMUNITIES

THURSDAY, JULY 23, 2020

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON COMMODITY EXCHANGES, ENERGY, AND
CREDIT,
COMMITTEE ON AGRICULTURE,
Washington, D.C.

The Subcommittee met, pursuant to call, at 10:05 a.m., in Room 1300 of the Longworth House Office Building, Hon. David Scott of Georgia [Chairman of the Subcommittee] presiding.

Members present: Representatives David Scott of Georgia, Spanberger, Delgado, Craig, Axne, Peterson (*ex officio*), Austin Scott of Georgia, Crawford, Rouzer, Johnson, Baird, Hartzler, and Conaway (*ex officio*).

Staff present: Lyron Blum-Evitts, Patrick Delaney, Ross Hettervig, Isabel Rosa, Anne Simmons, Ashley Smith, Anna Brightwell, Josh Maxwell, Ricki Schroeder, Patricia Straughn, John Konya, Dana Sandman, and Justina Graff.

OPENING STATEMENT OF HON. DAVID SCOTT, A REPRESENTATIVE IN CONGRESS FROM GEORGIA

The CHAIRMAN. This hearing will come to order. Today, what I would like to do is to open this hearing up with a word of prayer, and I would like to ask if my good friend, brother, and cousin, Austin Scott, would lead us in a moment.

Mr. AUSTIN SCOTT of Georgia. I would be honored to.

The CHAIRMAN. Okay.

Mr. AUSTIN SCOTT of Georgia. Let us pray.

Lord, we love you and we know you love us. You have given us so many things to be thankful for, Lord, and as we reflect upon the life of our dear friend and brother, John Lewis, we want to thank You for allowing us to experience him and for the walk that he walked, and the faith that he had in You to, Lord, let people attack him and to change them in his peaceful manner by never attacking back. And Lord, we know that we just have so much to be thankful for in this country and this world. We would ask that You would bless the leadership, and that You would put Your hand on us, Lord, and that You would help guide us in a direction that let us lead this country and this world, and in a direction that will be pleasing to You. Lord, I make this prayer in the name of Your Holy Son, Jesus Christ. Amen.

The CHAIRMAN. Thank you, Austin. I appreciate that. Excellent prayer to get us started off right.

This hearing of the Subcommittee on Commodity Exchanges, Energy, and Credit entitled, *On-Farm Energy Production: Impacts on Farm Income and Rural Communities*, will come to order. And welcome and thank you for joining us at this hearing today.

After brief opening remarks, the hearing will be open to questions. Members will be recognized in order of seniority, alternating between Majority and Minority Members. For those participating remotely today, when you are recognized, you will be asked to unmute your microphone and you will have 5 minutes to ask your questions, or make a comment. And in order to get as many questions in as possible, the timer will stay consistently visible on the screen, and when 1 minute is left, the light will turn yellow signaling time is close to expiring.

Let me begin with my opening remarks, and I want to say good morning to everyone who is here in the committee room, those of you who are out, and other means of communicating in this, our very first hybrid hearing of the Subcommittee on Commodity Exchanges, Energy, and Credit.

We are going to talk today about an exciting and very, very important subject, especially in context of what is going on in our country today.

As the economy continues to struggle the effects of the coronavirus pandemic, Americans in towns both large and small are keeping an eye on not only their own health, but also on their financial bottom line. For all Americans, that includes thinking about the cost of energy that powers our homes, our cars. But for that American farmer, that also includes thinking about additional ways that our farmers can boost their incomes as the farm economy continues to lag. There could be no more important issue than the one we are going to deal with today. We can do without a lot of things, but we cannot do without food and without water.

Today's topic touches on both of those things, because we are talking about on-farm energy. Energy is a particular concern for farmers, and for ranchers, as approximately 15 percent of production costs for U.S. farms is tied up in energy costs. By comparison, the average American household spends a little over two percent of its budget on electricity and the same amount for gas. The better a farm operation is able to manage its energy costs, the better it can weather the tough times like what we are seeing clearly today.

I am excited to have four innovative farmers here with us today. Our witnesses are going to talk about the pioneering work underway on their own farms to explore ways of reducing their energy use, develop alternative sources of energy, and grow more diverse income streams. This is a discussion that I know will benefit every farmer and rancher who is watching.

And our discussion of how these folks are going to work on home-grown energy sources on the farm is one that I hope will help move our climate discussion forward as well, highlighting especially the capacity of agriculture as a source of clean, domestic, renewable energy.

Today we will look at the programs in the 2018 Farm Bill that help to encourage investment and exploration in the field of on-farm energy creation, storage, and use. These programs in the energy and conservation titles range from ones that help producers

transition to cleaner and more efficient energy systems and ones on the cutting edge of new biobased energy feedstocks. We will also look at other ways farmers are helping to move the renewable energy forward by exploring solutions like our wind, our solar, within their operations as well.

[The prepared statement of Mr. David Scott follows:]

PREPARED STATEMENT OF HON. DAVID SCOTT, A REPRESENTATIVE IN CONGRESS FROM
GEORGIA

Good morning, and thank you for joining us at the first hybrid hearing of the Subcommittee on Commodity Exchanges, Energy, and Credit. We're going to talk today about an important subject, especially in the context of what's going on in our country today. As the economy continues to struggle with the effects of the coronavirus pandemic, Americans in towns large and small are keeping an eye not only on their health, but also on their financial bottom line. For all Americans that includes thinking about the cost of the energy that powers their homes and cars. For American farmers, that also includes thinking about additional ways they can boost their incomes as the farm economy continues to lag.

Today's topic touches on both of those things, because we're talking about on-farm energy. Energy is a particular concern for farmers and ranchers, as approximately 15 percent of production costs for U.S. farms is tied up in energy costs. By comparison, the average American household spends a little over two percent of its budget on electricity and the same amount for gas. The better a farm operation is able to manage its energy costs, the better it can weather the tough times that we're seeing so clearly today.

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Today we'll look at programs in the 2018 Farm Bill that help to encourage investment and exploration in the field of on-farm energy creation, storage, and use. These programs—in the energy and conservation titles—range from ones that help producers transition to cleaner and more efficient energy systems and ones on the cutting edge of new biobased energy feedstocks. We'll also look at other ways farmers are helping to move the renewable energy forward by exploring solutions like wind and solar within their operations as well.

With that, I will recognize my Ranking Member, Mr. Scott of Georgia, for any opening comments he'd like to make.

The CHAIRMAN. In consultation with the Ranking Member and pursuant to Rule XI(e), I wanted to make Members of the Subcommittee aware that other Members of the full Committee may join us today.

Now, I recognize Ranking Member Austin Scott for his opening statement.

**OPENING STATEMENT OF HON. AUSTIN SCOTT, A
REPRESENTATIVE IN CONGRESS FROM GEORGIA**

Mr. AUSTIN SCOTT of Georgia. Thank you, Mr. Chairman, and thank you for calling today's hearing to review on-farm energy production. I believe this hearing is very timely, given the current discussions taking place on the future of U.S. energy policy, and the future of U.S. agriculture.

Recently, the Majority staff, about 3 weeks ago, of the Select Committee on Climate Crisis released a report, a very large report

as I just held up,* recommending Congressional action needed to meet a goal of reaching net zero greenhouse gas emissions economy-wide no later than 2050. And while I think that a lot of the recommendations focus too much on reducing America's dependence on fossil fuels and not enough on emissions, in other words, if we could move from diesel to natural gas, that certainly is a benefit to the environment, that the focus on emissions would be more productive than the focus on simply eliminating fossil fuels.

But specifically, this report outlines principles for Federal carbon price, which is a direct tax on businesses and consumers. I want to make this clear. I believe that we can and we should do a better job of taking care of the environment. And in taking care of the environment, we have to acknowledge that the habitat is important to the wildlife of this country.

I am prepared to work in a bipartisan manner to improve upon current programs and find new solutions, but I cannot support an extreme climate agenda that fails to consider rural Americans who have to shoulder the burden of the majority of the staff proposals that have come out in this report. Many of these proposals are aimed at the basic underpinning of our farming, manufacturing, energy, and transportation systems, and require changes of marginal or unknown benefit that would have significant implications for the profitability of U.S. agriculture and the U.S. economy. The report recognizes these glaring consequences and makes several recommendations for funding economic transition payments. In other words, the report's authors know and acknowledge that there are harmful consequences to their proposals, and rather than develop better, more thoughtful proposals in a bipartisan nature, they continue to recommend Federal overreach and dismantling of strong business and agricultural communities.

Many of the agricultural recommendations do highlight the benefits farm bill programs play in assisting farmers, ranchers, and foresters in being the best stewards of the land. However, some of the recommendations also uncover what seems to be a hidden agenda: increased compliance and government control of our producers' land and livelihood. This is in direct conflict with the bipartisan principles that on-farm stewardship should be locally-led, voluntary, and incentive-based. The 2018 Farm Bill has voluntary farm programs that help farmers implement new practices that sequester carbon, reduce emissions, and adopt more energy efficient farming practices.

One of these programs proven to be effective is the Environmental Quality Incentives Program. The Natural Resources Conservation Service, or the NRCS, has adopted anaerobic digesters as a conservation practice, and provides cost-share assistance to producers. This allows farmers and ranchers to voluntarily implement this innovative on-farm energy production practice by receiving financial and technical assistance through EQIP.

Another important program in the farm bill is the Rural Energy for America Program, which promotes energy efficiency and renewable energy development through grants and guaranteed loans.

***Editor's note:** the report referred to is retained in Committee file, and it is available at: <https://climatecrisis.house.gov/sites/climatecrisis.house.gov/files/Climate%20Crisis%20Action%20Plan.pdf>.

Grants may be used to finance energy audits for renewable energy technical assistance and site assessment, while the guaranteed loans may be used for construction of renewable energy systems, like anaerobic digesters, wind turbines, or solar panels.

As mentioned before, making these improvements on the farm can produce a variety of benefits for farmers and ranchers. For example, using an anaerobic digester turns waste into energy, which can then be used for several purposes, including generating electricity to help run the farm, processing it further into high quality fuels, or even sold to the local power grid. These improvements will allow farmers and ranchers to reduce input costs needed to operate their farm and can even help increase income.

While it is easy to talk about the benefits of on-farm energy production for farmers and ranchers, I would be remiss if I did not mention barriers to entry. There are generally extremely high costs to build the infrastructure needed for on-farm energy production. While the farm bill programs help cover some of the costs involved, many farmers and ranchers do not have the ability to take on these additional up-front costs today to make farm improvements due the current state of the farm economy.

Mr. Chairman, we have a great panel of witnesses that I look forward to hearing from. They have extensive knowledge of on-farm energy production. I want to thank them for joining us today. I am looking forward to a productive discussion on what we can do to improve access to these programs, and let me once again say, I think that we can and should do a better job of taking care of the environment.

With that said, Mr. Chairman, I am committed to working with you to find the path forward.

The CHAIRMAN. Thank you, Ranking Member Scott.

All Members are reminded that face coverings are required for attendance at meetings longer than 15 minutes in committee hearing rooms. This is in accordance with Section 3.2.1 of the *Attending Physician's Guidelines*.

Now I would like to recognize Chairman Peterson for any opening comments he would like to make.

**OPENING STATEMENT OF HON. COLLIN C. PETERSON, A
REPRESENTATIVE IN CONGRESS FROM MINNESOTA**

Mr. PETERSON. Thank you very much, Mr. Chairman, and thank you for your leadership on this issue. This is something that I have worked on, been involved in for a long time.

There is no question that we can produce energy on the farm. We have been able to in a number of different ways do that over the years. The problem has been to be able to make the economics work long-term. And to some extent, this is scale. To some extent, it is technology. To some extent, it is a problem with what happens with other energy sources. When oil collapses, then that changes the equation in terms of how the rest of this stuff works.

I am all in favor of doing whatever we can to exploit this and to be able to do as much as possible on the farm with renewable energy. I have told a lot of people this over the years, it has to be able to be, at some point, stand on its own. I am okay with helping it get started and okay with having some ability to get it going. But

there has to be a light at the end of the tunnel. It can't be something that the government is going to subsidize forever. And we have some of that going on in some of these areas. Like I say, I am for all energy whatever it is. Whether it is oil, gas, ethanol, whatever it is, as long as it makes economic sense. It works and that it is viable for the long-term.

And so, I hope that as we provide support that we do it in a way that we are supporting things that have the ability to be viable in the long-term. And that has been a challenge, with some of the stuff that has happened, and I just think we need to keep that focus on it.

Mr. Chairman, I appreciate your leadership in calling this hearing today. I look forward to hearing what the witnesses have to say. I have other hearings going on, so I may not be here the whole time, but again, thank you for what you are doing, and I yield back.

The CHAIRMAN. Thank you, Chairman Peterson. I appreciate your comments.

And now, I would like to recognize our distinguished Ranking Member, Congressman Mike Conaway, for any opening comments he would like to make.

**OPENING STATEMENT OF HON. K. MICHAEL CONAWAY, A
REPRESENTATIVE IN CONGRESS FROM TEXAS**

Mr. CONAWAY. Thank you, Mr. Chairman. I, too, appreciate you having this hearing. I also appreciate you starting with a prayer. I think we deliberate better when we start that way, so thank you for doing that.

I agree with most everything that has been said. The real question for me, though, is who pays for it? The Chairman mentioned the government pays for it. It is really the taxpayers that ultimately fund all of those programs that we put in place, and whether it is a tax subsidy that goes out directly, or whether it is some sort of transfer payment between the folks that are in the system, all of those things, at the end of the day, the Chairman is exactly right. Can we afford it? Does it make sense?

I noticed recently when the price of oil collapsed in March, some of the anti-oil folks were gleeful about that. The truth of the matter is, they really should want really high oil prices, really high gasoline prices because it makes all of these other alternatives competitive against the current system. Whatever that utopia looks like out there that doesn't use fossil fuels—and maybe that is centuries from now we will get there. But in the meantime, we have to afford it. We have to be able to live. We have to be able to sustain it, keep our families alive, and those kinds of things. As we go up about these projects, figuring out who pays for it, where that cost gets ultimately settled is really a key to making this thing work.

So again, Mr. Chairman, thank you for having this hearing. I appreciate our witnesses being here, and I yield back.

The CHAIRMAN. Thank you very much, Ranking Member Conaway.

The chair would request that other Members submit their opening statements for the record so the witnesses may begin their testimony, and to ensure that we have ample time for questions.

I would like to welcome all of our distinguished witnesses. Thank you for being here on this, our very first hybrid Committee hearing.

Our witnesses today, first, Mr. Jim Falk, who is President of Falk Seed Farm, Incorporated, co-owner of Falk Farm, on behalf of the Minnesota Farmers Union and National Farmers Union from Murdock, Minnesota.

Next, we have Mr. Brian Sievers. Mr. Brian J. Sievers, who is the owner of Sievers Family Farms, Chief Operating Officer, AgriReNew, on behalf of America Biogas Council, Stockton, Iowa.

And we have Mr. Will Harris, who is the owner of White Oak Pastures, Bluffton, Georgia, from our beloved State of Georgia. Of course, all of our states are beloved.

I will recognize the gentleman from Indiana, Mr. Baird, to make an introduction of our final witness.

Mr. BAIRD. Thank you, Chairman Scott, Ranking Member Scott, and Members of the Subcommittee, as well as Chairman Peterson of the Agriculture Committee and Ranking Member Conaway of the Agriculture Committee. It is definitely my privilege to introduce to you today the founder and Chairman of Fair Oaks Farms, Dr. Mike McCloskey. Dr. McCloskey has followed his passion for animal agriculture since the early 1980s when he ran a successful veterinary clinic, and this passion has led him to creating Fair Oaks Farm, along with one of the nation's largest dairy cooperatives, and in that process, the creation of a dairy-based wellness product.

In addition to being Chairman of Fair Oaks Farms, Dr. McCloskey has worked tirelessly in the agricultural community by serving on numerous boards and associations. He is the Chairman of the Environmental Issues Committee within the National Milk Producers Federation. And like all farmers, Dr. McCloskey understands the need to be good stewards of our environment. He has been able to seek out opportunities for environmentally sustainable practices that are beneficial to agriculture, and a good example is that he installed their first anaerobic digester in 2002, which processed cow manure and food waste into electricity. Seven years later, they built their second digester with the goal of creating renewable biogas, and that is some of the information that he is going to share with us here today.

In partnership with Cummins and Kenworth, Dr. McCloskey has a fleet of over 40 trucks that run on renewable, compressed natural gas from the biogas, and each truck has traveled over 1 million miles transporting milk from farms to processing facilities. This record of achievement is why Dr. McCloskey is before us and before this Committee today. He possesses an expertise from decades of working in the dairy industry and the agricultural industry in general.

I really look forward to hearing his testimony before this Committee and how we can improve the lives of farmers and rural communities. I want to welcome Dr. McCloskey.

Thank you. I yield back.

The CHAIRMAN. Thank you very much.

The chair would request that any other Members submit their opening statements for the record so that our witnesses may begin their testimony to ensure we have ample time for questions.

Let me, if I may, start off with my questions. Before I do that, Ashley, excuse me for a minute, what would I do without ample good staff?

Now, we will recognize Mr. Falk for 5 minutes.

STATEMENT OF JIM FALK, PRESIDENT, FALK'S SEED FARM, INC.; CO-OWNER, FALK FARM, MURDOCK, MN; ON BEHALF OF MINNESOTA FARMERS UNION, NATIONAL FARMERS UNION

Mr. FALK. Chairman Scott, Ranking Member Scott, and Members of the Committee, thank you for giving me the opportunity to testify today. I'm Jim Falk, a fourth generation farmer from Swift County, Minnesota. I farm with my son, Andrew, who is the fifth generation to work our land. I am also a member of Minnesota Farmers Union and am testifying today on behalf of the National Farmers Union.

Our farm includes about 1,000 acres, of which approximately 550 are in crop production, 250 in pasture and hay meadow, and the balance in conservation programs and wetlands. Since 1985, we have also owned a seed cleaning facility, Falk's Seed Farm, Inc., which is now a key part of our operation. We are a small regional seed company, with the majority of our customers farming within a 150 mile radius of our business.

The energy consumption of the seed plant is significant due to the electrical motors needed for processing. We process seed or grain for approximately 10 months of the year, with October through May being our peak season.

From 2016 through 2019, the average annual cost of power from both sources was \$14,332 per year. My wife, Karen, and I have been interested in utilizing renewable energy to offset our power consumption for quite a while. We wanted to do our part to offset our carbon footprint and power the majority of the seed plant from renewable energy produced onsite. In addition, as the cost of power continues to rise, there should be a cost savings for us after the equipment is paid for. In 2016, we installed a 30-kW wind turbine to connect to our three-phase power, and in 2017, we installed a 33-kW solar system on the seed plant roof that is connected to our single-phase power. The tax credits for small wind and solar were forecast to be reduced, so we felt we needed to proceed while those credits were available. While we applied for grants from USDA's Rural Energy for America Program to help fund both projects, our applications were unsuccessful. It seems the demand for REAP grants far exceeds the funding available.

With both our wind and solar systems functioning, today we are producing approximately 73.7 percent of the seed plant's power needs on an annual basis. This hits our target of producing approximately 70 percent of the seed plant's power needs when we initially made our plan and I believe provides long-term sustainability to help reduce our energy cost.

I was asked to testify today to speak about my experience with on-farm wind energy, but my experience also includes on-farm solar energy as well. As a result, I am familiar with the positives and negatives of both.

To be sure, both energy systems have their place. Wind can produce power any time of the day or night if the wind is blowing.

However, our turbine, in our local wind resources, is under performing in comparison to what was projected when I purchased the machine. My tower height is 100', and other installations with taller towers may likely have higher outputs than mine. Our solar system, meanwhile, is performing above what was projected as our likely output for power per year.

The hybrid system I have works well for me; however, I feel solar is the safer investment for farmers to produce their own renewable energy with a system that fits their operation. It makes good sense that farmers and ranchers are able to produce their own clean energy onsite. It makes good sense for farmers and ranchers to produce their own clean energy onsite. To accomplish this, we need tax incentives, including an extension of the tax credits for small wind and solar, along with increased and targeted research spending, and additionally, more funding and farmer access for REAP are needed to get more renewable energy systems installed on private lands.

On-farm renewable energy systems are vital tools for U.S. farmers and ranchers and their businesses as they work towards economic and environmental sustainability and combat climate change. My farm and business are just one example of that.

Thank you for allowing me to share my experience with you today.

[The prepared statement of Mr. Falk follows:]

PREPARED STATEMENT OF JIM FALK, PRESIDENT, FALK'S SEED FARM, INC.; CO-OWNER, FALK FARM, MURDOCK, MN; ON BEHALF OF MINNESOTA FARMERS UNION, NATIONAL FARMERS UNION

Chairman Scott, Ranking Member Scott, and Members of the Committee, thank you for providing me the opportunity to testify today regarding "On-Farm Energy Production: Impacts on Farm Income and Rural Communities."

I am Jim Falk, a fourth-generation family farmer from Swift County, Minnesota. I farm with my son, Andrew, who is the fifth generation to work our land. I am also a member of Minnesota Farmers Union and am testifying today on behalf of the National Farmers Union (NFU).

Our farm includes about 1,000 acres, of which approximately 550 are in crop production, 250 in pasture and hay meadow, and the balance in conservation programs and wetlands. Since 1985, we have also owned and operated a seed cleaning facility, Falk's Seed Farm, Inc., which is now a key part of our operation. We are a small regional seed company, with the majority of our customers farming within a 150 mile radius of our business.

The energy consumption of the seed plant is significant due to the electric motors needed for processing. We process seed or grain for approximately 10 months of the year—October through May is our peak season. The seed plant uses three-phase power for most of the motors within the plant. We also use single-phase power for all other seed plant electrical needs, including lighting, heat, and temperature control for our office. From 2016 through 2019, the average annual cost of power from both sources was \$14,332 per year.

My wife, Karen, and I have been interested in utilizing renewable energy to offset our power consumption for quite a while. We wanted to do our part to offset our carbon footprint and power the majority of the seed plant from renewable energy produced onsite. In addition, as the cost of power continues to rise, there should be a cost savings for us after the equipment is paid for. Minnesota has a net metering law that allows for renewable energy systems under 40 kilowatts (kW) to be installed for each meter onsite. In 2016, we installed a 30 kW wind turbine to connect to our three-phase power, and in 2017, we installed a 33 kW solar system on the seed plant roof that is connected to our single-phase power. The tax credits for small wind and solar were forecast to be reduced, so we felt we needed to proceed while those credits were available. While we applied for grants from USDA's Rural Energy for America Program to help fund both projects, our applications were unsuccessful. It seems the demand for REAP grants far exceeds the funding available.

With both our wind and solar systems functioning, today we are producing approximately 73.7 percent of the seed plant's power needs on an annual basis. This hits our target of producing approximately 70 percent of the seed plant's power when we initially made our plan and I believe provides long-term sustainability to help reduce our energy cost.

I was asked to testify today to speak about my experience with on-farm wind energy, but my experience also includes on-farm solar energy production. As a result, I am familiar with the positives and negatives of both. To be sure, both energy systems have their place. Wind can produce power any time of the day or night if the wind is blowing. However, our turbine, in our local wind resource, is under performing in comparison to what was projected when I purchased the machine. My tower height is 100', and other installations with taller towers may likely have a higher power output than mine. Our turbine suffered damage from a severe weather event in 2019, and it took about 7 months to complete the repairs. There is a need for more service technicians trained to work on turbine repairs. The turbine is functional again, producing power for the seed plant, but it was offline for quite some time and is an example of the performance and reliability issues that have plagued the small wind industry for some time.

Solar power generation doesn't face these challenges. Our solar system is performing above what was projected as our likely output of power per year. The solar panels I have installed have a 25 year warranty, and because they are mounted on our roof, there are no moving parts to wear or break. Repair and maintenance issues for a solar system are minimal compared to a wind turbine. As the cost of solar continues to come down, solar will be more appealing to farmers and it will be harder for small wind companies to compete.

The hybrid system I have works well for me, but, in my opinion, solar is the safer investment for farmers who wish to install a renewable energy system. The fact is, both these systems work and there is a lot of interest in using both wind and solar on the farm. However, I feel there needs to be a greater effort to encourage farmers to produce their own renewable energy. It just makes good sense that farmers and ranchers are able to produce their own clean energy onsite.

To be sure, renewable energy production presents a lot of opportunities for farmers.¹ Between 2012 and 2017, there was a 132 percent increase in the number of farms that were generating their own power from renewable sources.² The number of farms with wind turbines increased by 56 percent during that time period, while solar panel installations increased by 148 percent. Farmers also invested in geothermal/geoexchange systems and a small number of methane digest[er]s during that time.

As of 2017, there were about 81,000 small-scale wind turbines installed at homes, farms, and other facilities across the United States—about ¼ of which were for agricultural uses.³ The center of the United States, from Texas to North Dakota, has particularly good conditions for wind energy production.⁴ Minnesota ranked third in 2017 for distributed wind generation capacity, behind Iowa and Texas.

NFU supports policies that expand the production and use of on-farm renewable energy. NFU, which is a member of the AgEnergy Coalition, supports making renewable energy development, and reducing U.S. dependence on fossil fuels, a top priority. This includes through ambitious national investments renewable energy production. Our nation's farmers and ranchers will be a key player in reaching these necessary goals. Private agricultural lands can host wind and solar infrastructure that can power farms and, if large enough, sell energy back to the grid. The production of biofuels feedstocks can help to ease America's reliance on petroleum to fuel our vehicle fleet, while woody biomass is a sustainable source for heating and power generation. A combination of these and other renewable energy production technologies will be needed to ensure a sustainable and climate friendly future for America.

Tax incentives, including an extension of tax credits for small wind and solar, increased and targeted research spending, limits on consolidation in the renewable energy sector, and more funding and farmer access for REAP are needed to get more renewable energy systems, especially promising but underutilized technologies, installed on private lands across the country. Lawmakers should also protect and ex-

¹NFU staff provided background research and assisted in the compilation of this document.

²USDA 2017 Census of Agriculture:https://www.nass.usda.gov/Publications/AgCensus/2017/Full_Report/Volume_1_Chapter_1_US/st99_1_0049_0050.pdf.

³DOE 2017 Distributed Wind Market Report: <https://www.energy.gov/eere/wind/downloads/2017-distributedwind-market-report>.

⁴U.S. Energy Information Administration: <https://www.eia.gov/todayinenergy/detail.php?id=31032#tab2>.

pand the Renewable Fuel Standard, recognizing its importance as both a key tool for curbing the effects of climate change and a market for U.S. farmers.

All told, on-farm renewable energy and biofuels production are vital tools for U.S. farmers and ranchers and their businesses as they work toward economic and environmental sustainability and combat climate change. Our farm and business are just one example of that.

Thank you for allowing me to share my experience with you today.

The CHAIRMAN. Mr. Brian J. Sievers, owner of Sievers Family Farms, Chief Operating Officer, AgriReNew, on behalf of America Biogas Council, Stockton, Iowa. We will hear your 5 minutes.

STATEMENT OF HON. BRYAN J. SIEVERS, OWNER, SIEVERS FAMILY FARMS; CHIEF OPERATING OFFICER, AGRIRENEW; VICE CHAIR, BOARD OF DIRECTORS, AMERICA BIOGAS COUNCIL, STOCKTON, IA

Mr. SIEVERS. Chairman Scott, Ranking Minority Member Scott, Chairman Peterson, Ranking Member Conaway, and Members of the Committee, thank you for asking me to testify today.

During these especially unsettling times, I am grateful to share with you how farm energy production has helped my bottom line, improved the risk-bearing ability of our farm, and benefitted the community around us.

My wife Lisa and I are fifth generation owners of a farm near Stockton, Iowa. We run a 2,400 head beef cattle feedlot. We produce corn, soybeans, and hay on approximately 2,200 acres. Our farm operates two complete mix anaerobic digesters, which produces biogas that is used to generate electricity which is sold to Alliant Energy, as well as reclaimed heat, which is used to heat our digesters and other outbuildings. We use a variety of feedstocks in the digesters, including beef cattle manure, biomass from our farm fields, organic food residuals left over from processing food, and purpose-grown cover crops. Conservation and environmental stewardship are paramount to our operation. We have implemented numerous water and soil quality practices over the years, including grassed waterways, field borders, buffer strips, terraces, contour farming, no-till, strip-till, grid soil sampling, and cover crops.

When my wife and I constructed our digesters and renewable energy facility on our farm in 2013, we were grateful to receive support from the Federal Government through a few programs: the Renewable Energy for America Program, or REAP; the Environmental Quality Incentives Program, or EQIP; a Section 1603 energy grant through the American Recovery and Reinvestment Act; and an energy efficiency rebate from our local service provider, Alliant Energy. We also participated in the Biomass Crop Assistance Program, where the biomass we captured from our cornfields was first used as bedding for our cattle, and then as a substrate in our digesters. Without the significant support we received from the Federal Government from programs like REAP and EQIP, as well as the BCAP Program, we would not have been able to build our highly functioning biogas systems, which generate renewable energy and soil products, while making our farm more sustainable and protecting our air, water, and soil.

From an investment standpoint, we leveraged these Federal programs to secure \$4.8 million in private investments to construct

our digester facilities so that for every Federal dollar spent, almost \$5 in new private investment has been made.

Unfortunately, funding for many of these programs has disappeared since 2013. Reinstating the funding for these and other valuable programs will allow farmers and ranchers to design and construct on-farm anaerobic digester facilities so they can realize the benefits we have received which have helped us weather financial challenges due to falling commodity prices, to improve our water quality, soil health, and management of organic waste streams from our beef cattle feedlot, as well as other agricultural processing facilities in our region.

When it comes to addressing our changing climate, enhancing water and air quality, improving soil health, increasing agriculture sustainability, while providing valuable economic benefits, I genuinely believe on-farm anaerobic digesters can play a vital and significant role.

I serve as Vice Chair and board member of the American Biogas Council, which represents over 200 companies in all parts of the biogas supply chain. We also collaborate with the AgEnergy Coalition, and Solutions from the Land. These organizations believe that strengthening on-farm economies is key to advancing the deployment of renewable energy, and the production of biofuels and renewable chemicals.

Many aspects of the 2018 Farm Bill support on-farm energy production, most of which are included in the energy title. These programs create high value jobs and new income streams for American farmers, accelerate the commercialization of new technologies, and support the construction of biogas systems and biorefinery systems in rural communities. I urge the Committee to push for full implementation of the farm bill and support robust annual appropriations for these exceptionally impactful programs.

We are especially pleased to see that the appropriators have recognized the need to support technologies that have been historically under-funded within REAP by establishing a REAP reserve fund for under-served technologies such as biogas and small wind energy. This House Appropriations Committee encouraged USDA to establish the reserve fund and provided \$10 million in funding for a pilot program to be created at the USDA. We are hopeful that this will improve access and we will see greater deployment of these exceptionally valuable technologies.

The farm bill also contained two initiatives of importance to the biogas industry. Section 9011, the Carbon Utilization and Biogas Education Program, was established and recognized that digesters are one of the greatest methods available to trap methane-emitting waste products and convert it to renewable energy and nutrient-rich soil amendments. However, this program has yet to receive funding. Another priority highlighted by the Committee in the conference report, the establishment of the Biogas Opportunities Roadmap Taskforce, has yet to be acted upon by the USDA. While outside of the jurisdiction of this Committee, we also urge the Committee to support the Renewable Fuel Standard as it continues to provide value to on-farm energy producers. A strong and properly administered RFS not undermined by the unscrupulous issuances of small refinery exemptions raises all boats in the rural economy.

We also urge the Committee to support efforts to extend tax policies that support on-farm energy production such as the PTC and ITC for renewable energy, and to take under advisement the recent recommendations pertaining to sustainable agriculture released by the House Select Committee on Climate.

Thank you for your time today, and I will be happy to answer any questions.

[The prepared statement of Mr. Sievers follows:]

PREPARED STATEMENT OF HON. BRYAN J. SIEVERS, OWNER, SIEVERS FAMILY FARMS;
CHIEF OPERATING OFFICER, AGRIRENEW; VICE CHAIR, BOARD OF DIRECTORS,
AMERICA BIOGAS COUNCIL, STOCKTON, IA

Introduction

Chairman Scott, Ranking Minority Member Scott, and Members of the Committee, thank you for asking me to testify at today's hearing regarding On-Farm Energy Production: Impacts on Farm Income and Rural Communities.

My wife Lisa and I own and operate Sievers Family Farms near Stockton, Iowa. We are fifth generation Iowa farmers that run a 2,400 head beef cattle feedlot, produce corn, soybeans, and hay on approximately 2,200 acres. Our farm operates two complete-mix anaerobic digesters where we produce biogas that is used to generate renewable electricity, which is sold to Alliant Energy, and reclaimed heat, which is used to heat our digesters and other buildings on our farm. We focus on stewardship and conservation of our natural resources in our operations and have implemented numerous water quality and soil health practices over the years, including grassed waterways, field borders, buffer strips, terraces, contour-farming, no-till and strip-till, grid soil sampling, and cover crops.

When my wife and I constructed our digesters and renewable energy facility on our farm in 2013 we were grateful to receive support from the Federal Government through a few programs: the Rural Energy for America Program (REAP), Environmental Quality Incentives Program (EQIP), a Section 1603 Energy grant through the American Recovery and Reinvestment Act, and an energy efficiency rebate from our local service provider, Alliant Energy. We also participated in the Biomass Crop Assistance Program (BCAP) where the biomass we captured from our corn fields was used first as bedding for our cattle and then as a substrate in our digesters. Without the significant support we received from the Federal Government for programs like REAP and EQIP, as well as the BCAP program, we would not have been able to build our highly functioning biogas system which generates renewable energy and soil products while making our farm more sustainable and protecting our air, water, and soil. From an investment standpoint, we leveraged these Federal programs to secure \$4.8 million in private investments to construct our digester facilities, so that for every Federal dollar spent, almost \$5 in new private investment have been made.

As a result of my experience in agriculture and anaerobic digestion, I also serve as a Vice-Chair on the Board of Directors of the American Biogas Council (ABC) which is the only national trade association representing the entire biogas industry in the U.S. We represent over 220 companies in all parts of the biogas supply chain who are dedicated to maximizing the production and use of biogas from organic waste. The mission of the ABC is to grow biogas business in the United States which creates jobs, protects our air, water and soil and catalyzes energy independence and new investments. Biogas systems provide waste management solutions for organic material, recycle nutrients, create soil products, and produce energy, most often in the form of either electricity or biogas, which can be upgraded into renewable natural gas (RNG).

Biogas systems are one of the most comprehensive ways to recycle organic waste streams. At their core, biogas systems recycle organic wastes into renewable energy and soil amendment products using the natural process of anaerobic digestion. Biogas systems create sustainable recovered materials management solutions for organic wastes such as food waste, animal manures, wastewater treatment biosolids, yard trimmings, and organic waste from the industrial processing of food. Biogas systems also recycle nutrients like nitrogen, phosphorus, potassium, calcium, and sulfur which reduce the need to produce synthetic fertilizers for our agriculture industry. Biogas systems reduce odor and greenhouse gas emissions both from the organic wastes they recycle and the fossil fuels they replace. On the energy side, biogas systems are unique among renewable energy technologies because they

produce energy 24/7 365 days a year with a 95% combined efficiency rate producing electricity, heat, and/or renewable natural gas (RNG). Biogas systems produce energy and other products while providing solid waste recycling infrastructure and protecting our air, water and soil.

Biogas systems are a powerful tool for managing organic waste streams and creating on farm renewable energy. When biogas systems are coupled together with other renewable energy technologies like solar, wind, and energy storage they can provide 24/7 baseload power during the times that intermittent technologies are not producing power. Furthermore, biorefineries that are joined to or use an auxiliary biogas system can produce renewable natural gas from the waste product remains from the production of ethanol or grain alcohol. The renewable natural gas produced from the biogas system is then used to power the ethanol or grain alcohol plant and as a result, greatly lowers the greenhouse gas intensity of the biorefinery.

The ABC is in turn a member of the AgEnergy Coalition, a group of organizations committed to a strong, bipartisan support of on-farm energy production. The ABC and the AgEnergy Coalition believe that strengthening rural America and on-farm economies are two key ways to advance the deployment of renewable energy, and the production of biofuels and renewable chemicals.

Over the past few years, I have become very involved in Federal policy affecting the digester industry. I have also been and remain involved in advocating for state policies that affect the agricultural and rural economy. The experiences I gained while serving in the Iowa House of Representatives (2001–2003) and the Iowa Senate (2003–2004) helped me draft legislation in 2011 which expanded Iowa's renewable energy tax credit program for anaerobic digesters and biogas producers that generated electricity for re-sale to the electric utilities. This bill passed the Legislature and was signed into law by Governor Branstad in 2011.

I also served as Chair of the Biomass Conversion Committee. This committee was created by the Iowa Economic Development Authority as a result of the 2016 Iowa Energy Plan which was developed under the authority of then Lieutenant Governor Kim Reynolds. Our Biomass Conversion Committee prepared a Biomass Action Plan in the spring of 2018, now included in Iowa's comprehensive renewable energy policy. The Biomass Action Plan focuses on ways to enhance water quality, air quality, and soil health. Producing renewable electricity and renewable natural gas from the biogas produced through the anaerobic digestion of organic waste streams and manure is a key part of the Plan to reach those goals.

Supporting the BioEconomy

I come before you today to urge the Committee to continue to support On-Farm Energy Production. One of the best ways to do so is to closely oversee the implementation of the 2018 Farm Bill especially the energy title programs which encourages on farm energy production. This important piece of legislation contains many programs intended to help farmers diversify their income streams. In the midst of trade wars, the Administration's actions to undermine the Renewable Fuel Standard (RFS) and the effects of [COVID-19], the farm bill energy title programs continue to provide value to farmers, agricultural producers and small rural businesses. American farmers and rural communities are hurting. The challenges farmers are facing between low commodity prices caused by escalating trade wars, [COVID-19], and the gutting of the RFS caused by issuing more Small Refinery Exemptions than ever before has created significant financial pressures on farmers and ranchers. In both cases, the Trump Administration's actions have dramatically decreased the value of several of the products we and our fellow farmers produce which dramatically reduces the revenue we need to keep our farm operating.

Members of Congress have labored over numerous farm bills to craft policies that minimize fluctuations caused by commodity price volatility. As Members of this Committee continue to implement the 2018 Farm Bill, we ask Members to keep in mind the value of our 21st century biobased economy which can help offset some of the earlier discussed headwinds affecting our farms, families and the agriculture economy. Chief among these policies is the energy title, title IX, which creates high-value jobs and new income streams for American farmers, accelerates the commercialization of new technologies and products derived from agriculture, and supports construction of biogas systems and biorefinery manufacturing facilities in rural communities. Conventional and advanced biofuels (including renewable natural gas derived from biogas), chemicals, and biobased products made with biotechnology can drive the demand for crops (including cover crops) and crop residuals. This can boost on-farm revenue.

The 2018 Farm Bill (Agriculture Improvement Act of 2018; P.L. 115–334) extends most of the 2014 Farm Bill energy title programs through FY 2023 and provides new mandatory funding. It establishes one new program of great interest to the

American Biogas Council—the Carbon Utilization and Biogas Education Program. Unfortunately, however, the 2018 Farm Bill provides less mandatory funding than previous farm bills for energy title programs. For instance, the 2018 Farm Bill energy title programs mandatory funding level (\$375 million) is approximately 46% less than the mandatory funding provided in the 2014 Farm Bill (\$694 million). Alternatively, the total discretionary authorization provided by the 2018 Farm Bill (\$1.7 billion) is approximately 13% more than what was authorized in the 2014 Farm Bill (\$1.5 billion) for the energy programs. While the latter increase sounds positive, most energy title programs have not received discretionary appropriations under previous appropriation bills, something that should change.

To ensure the American bioeconomy and on farm energy generation continues to expand, Congress must continue to oversee the implementation of the 2018 Farm Bill. Given the discrepancy in mandatory energy title funding between the 2014 and 2018 Farm Bill, we urge Congress to increase annual discretionary funding to ensure the success of these programs. We ask that this Committee continue to work with Appropriators to encourage robust funding of the discretionary amounts for energy title programs. Robust discretionary funding will support additional deployment of on-farm renewable energy and catalyze the development of American biotechnologies that convert domestic crops and agricultural residues to energy and value-added products, while also creating high paying rural jobs, encouraging economic growth, and improving the health of our environment.

The following are the programs contained within title IX of the 2018 Farm Bill which support our industry and for each one:

- a description of how the programs work;
- products these programs have helped develop; and
- how the ABC believes these programs can be improved in their implementation.

Farm Bill Energy Title Programs

- Section 9002 Biobased Markets Program, known as the BioPreferred® Program
- Section 9003 Biorefinery, Renewable Chemical, and Biobased Product Assistance Program (BAP)
- Section 9005 Bioenergy Program for Advanced Biofuels
- Section 9007 Rural Energy for America Program (REAP)
- Section 9008 Biomass Research and Development (BRDI)
- Section 9010 Biomass Crop Assistance Program (BCAP)
- Section 9011 Carbon Utilization and Biogas Education Program

Section 9002, the Biobased Market Program, or the BioPreferred® Program

The goal of the BioPreferred® Program is to increase the purchase and use of biobased products from agricultural feedstocks. The program's purpose is to spur economic development, create new jobs and provide new markets for farm commodities. The increased development, purchase, and use of biobased products reduces our nation's reliance on petroleum, increases the use of renewable agricultural resources, and mitigates adverse environmental and health impacts.¹

BioPreferred® achieves these goals through two initiatives: (1) a mandatory purchasing requirement for Federal agencies and their contractors and (2) a voluntary labeling initiative for biobased products. Products that meet the minimum biobased content criteria may display the USDA Certified Biobased Product label.²

Under the Biobased Markets Program, Federal agencies and their contractors are generally required to purchase biobased products from 109 categories of goods—among which are cleaners, carpets, lubricants, office supplies, and paints—when an agency procures \$10,000 or more worth of an item within these categories during the course of a fiscal year, or where the quantity of such items or of functionally equivalent items purchased during the preceding fiscal year was \$10,000 or more.³

The 2018 Farm Bill extended the Biobased Markets Program through FY 2023, while adding some new implementation requirements. It requires the Secretary to update the eligibility criteria for determining which renewable chemicals will qualify for a “USDA Certified Biobased Product” label. It also requires the Secretary and the Secretary of Commerce to develop new North American Industry Classification System (NAICS) codes for both renewable chemical manufacturers and biobased product manufacturers, and for the Secretary to establish a national registry of testing centers for biobased products. Additionally, it requires USDA to establish an ex-

¹ USDA BioPreferred <https://www.biopreferred.gov/BioPreferred/faces/Welcome.xhtml>.

² *Ibid.*

³ *Ibid.*, Product Categories.

pedited approval process for products to be determined eligible for the procurement program and to receive a biobased product label. Finally, the 2018 Farm Bill prohibits a procuring agency from establishing procurement guidelines for biobased products that are more restrictive than what the Secretary has established. The 2018 Farm Bill authorized mandatory funding of \$3 million for each of FY 2019–FY 2023 for biobased products testing and labeling. Discretionary funding of \$3 million was authorized to be appropriated for each of FY 2019–FY 2023. We urge the Committee’s support of fully annual discretionary funding.

Recommendations

The BioPreferred® Program could be better utilized to create an initial market for the full range of products from a biogas system including fiber, nutrient products, digestate. The promotion of nutrient recycling is especially important in watersheds designated as distressed. The U.S. is witnessing significant water quality issues which could be addressed by processing manures and extracting the nutrients. These nutrients can then be further processed, taken out of the water shed, and be sold as sustainable fertilizer. The ABC encourages the BioPreferred® Program to be more inclusive of biogas system products, especially those generated from digestate, the digested organic material from an anaerobic digester.

Furthermore, we encourage USDA to increase outreach and education to augment public awareness and acceptance of renewable chemicals and biobased products through BioPreferred® program’s voluntary labeling and procurement system. Finally, we ask that the Committee support the full annual appropriation of \$3 million in discretionary funding for FY 2020–2023.

Section 9003 Biorefinery, Renewable Chemical, and Biobased Product Assistance Program

This program assists in the development of new and emerging technologies for advanced biofuels, renewable chemicals, and biobased products. Competitive grants and loan guarantees are available for construction and/or retrofitting of demonstration-scale biorefineries to demonstrate the commercial viability of one or more processes for converting renewable biomass to advanced biofuels.⁴

This loan guarantee program enables producers to access capital for large-scale projects in rural communities. Without the loan guarantee program, new technologies might never be able to pool sufficient capital to commence development of a project in a rural community with a small population.

The 2018 Farm Bill extended the program through FY 2023. It expanded the definition of eligible technology to include technologies that produce one or more of the following, or a combination thereof: an advanced biofuel, a renewable chemical, or a biobased product. The 2018 Farm Bill authorized mandatory funding of \$50 million for FY 2019 and \$25 million for FY 2020 for the cost of loan guarantees. Discretionary funding of \$75 million was authorized to be appropriated for each of FY 2019–FY 2023. We urge the Committee to support providing an additional \$75 million to this impactful program. support of fully annual discretionary funding.

Recommendations

This incredibly impactful program has allowed companies to put steel in the ground for first-of-their-kind biorefineries. These biorefineries are proven job and economic growth drivers for rural communities. We urge the Committee to support appropriating the maximum funding authorized—\$75 million annually—through 2023.

Section 9005 Bioenergy Program for Advanced Biofuels

This program encourages production of advanced biofuels, other than corn starch ethanol. The policy goal is to create long-term, sustained increases in advanced biofuels production. Awards are made through Rural Development to biofuels producers, based on the amount of advanced biofuels produced from renewable biomass. Feedstocks incentivized by this program include crop residue, food and yard waste, vegetable oil and animal fat. The program has promoted the development of biogas, wood pellets, biodiesel, and advanced and cellulosic ethanol.⁵

Section 9005 funding helps stakeholders increase their return on investment, which is needed to proceed with constructing a new plant or expanding capacity at an existing facility. Without Section 9005 mandatory funding, companies working on

⁴USDA Biorefinery Renewable Chemical and Biobased Product Manufacturing Assistance Program <https://www.rd.usda.gov/programs-services/biorefinery-renewable-chemical-and-bio-based-product-manufacturing-assistance>.

⁵USDA Advanced Biofuel Payment Program <https://www.rd.usda.gov/programs-services/advanced-biofuel-payment-program>.

advanced biofuel technologies have one less tool to support innovation and commercialization of the cleanest fuels in the world. Current USDA funding programs help advanced biofuels succeed; the industry cannot afford to be without one of these programs.

The 2018 Farm Bill authorized mandatory funding of \$7 million for each of FY 2019–FY 2023. Discretionary funding of \$20 million was authorized to be appropriated for each of FY 2019–FY 2023. We ask the Committee to continue to support the appropriation of full discretionary funding for the Bioenergy Program for Advanced Biofuels through FY 2023.

Section 9007 Rural Energy for America (REAP)

This outstandingly popular, successful, and constructive program supports every state and region and renewable energy and energy efficiency technology. REAP provides benefits to the full agricultural value chain, from producers and co-ops, to biotechnology and clean energy companies operating across rural America.⁶ Over 13,000 projects across all 50 states have received awards since its inception in the 2008 Farm Bill, leveraging more than \$3 billion in private investment. REAP is one of the rural economy’s best methods to drive growth in America’s energy infrastructure and resiliency.

The program has been instrumental in helping deploy biogas systems throughout the rural economy allowing agricultural producers, through the use of digesters, to make products from waste streams—manure and crop residues—that would otherwise be viewed as an environmental challenge. Farmers can now take these waste streams and make on-farm renewable energy, nutrient-rich soil amendments, fertilizers, renewable natural gas, and even feedstocks for renewable chemicals and bioplastics. The sale of all these products helps protect the agricultural producer from swings in commodity prices.

The 2018 Farm Bill extends the program through FY 2023. It also retains mandatory funding of \$50 million for FY 2014 and each fiscal year thereafter (thus, unlike other farm bill renewable energy programs, REAP’s mandatory funding authority does not expire with the 2018 Farm Bill). Mandatory funds are to remain available until expended. Discretionary funding is authorized to be appropriated at \$20 million annually for each of FY 2019–FY 2023. We urge the Committee’s support of fully annual discretionary funding.

Recommendations

This widely popular program has been oversubscribed year after year. We urge the Committee to support appropriating the maximum funding authorized—\$20 million annually—through 2023.

Historically, digesters and other under-served technologies such as small-scale wind have disproportionately been unsuccessful in securing REAP funding. The ABC and the AgEnergy Coalition encouraged the establishment of a reserve fund that would better support these “under-served technologies,” by setting aside no more than 10% of the funding for these under-served technologies and returning any unused funds back into the applicant pool. We understand that this concept is something the Committee recognizes, and that USDA has used similar structures in the past.

In the FY 2021 Agriculture Appropriations bill, the Committee encouraged USDA to establish the reserve fund and provided \$10 million in funding for a pilot program to effectuate the same goals as the reserve fund. We support both improving REAP for underserved technologies and the new pilot at USDA to address this problem. We are hopeful that these two efforts fund for under-served technologies such as biogas will improve access and that farmers, ranchers and small rural businesses can further deploy this exceptionally valuable technology. USDA should be in the business of promoting development of lessmarket mature but proven technologies like biogas and small-scale wind in REAP, as it does in other programs.

Section 9008 Biomass Research and Development Initiative (BRDI)

The Biomass Research and Development Initiative (BRDI) seeks to foster significant commercial production of biofuels, biobased energy innovations, development of biobased feedstocks, and biobased products and processes, including cost-competitive cellulosic ethanol. The program provides competitive funding in the form of grants, contracts, and financial assistance for research, development, and demonstration of technologies and processes. Eligibility is limited to institutions of higher learning, national labora-

⁶USDA Rural Energy for America Program <https://www.rd.usda.gov/programs-services/rural-energy-america-program-renewable-energy-systems-energy-efficiency>.

tories, Federal or state research agencies, private sector entities, and non-profit organizations.⁷

BRDI provides coordination of biomass research and development, including life-cycle analysis of biofuels, between USDA and DOE by creating the Biomass Research and Development Board to coordinate government activities in biomass research, and the Biomass Research and Development Technical Advisory Committee to advise on proposal direction and evaluation.⁸

Applicants seeking BRDI funding must propose projects that integrate science and engineering research in the following three technical areas that are critical to the broader success of alternative biofuels production: feedstock development, biofuels and biobased products development, and biofuels development analysis.

The 2018 Farm Bill extended the program through FY 2023. It amends the definition of biobased product to include carbon dioxide, and it requires the Initiative's technical advisory committee to include an individual with expertise in carbon capture, utilization, and storage. Furthermore, it expands the objectives of the Initiative to include the development of high-value biobased products that permanently sequester or utilize carbon dioxide. The 2018 Farm Bill provided no mandatory funding for the program. Discretionary funding of \$20 million is authorized to be appropriated annual for FY 2019–FY 2023. However, no discretionary funding has been appropriated for BRDI through FY 2020.

Recommendations

Further research into feedstock development and technology optimization will help encourage far greater deployment of biotechnologies including anaerobic digesters throughout the U.S. We urge the Committee to support full annual discretionary funding of BRDI at \$20 million for FY 2020–2023. Appropriations cuts in past years have led to smaller grants, limiting the diversity of projects.

Section 9010 Biomass Crop Assistance Program (BCAP)

The Biomass Crop Assistance Program (BCAP) provides financial assistance to owners and operators of agricultural and non-industrial private forestland who wish to establish, produce, and deliver biomass feedstocks.⁹ BCAP provides assistance by either (1) establishment of annual payments or (2) matching payments.

Establishment and annual payments are available to certain producers who enter into contracts with USDA to produce eligible biomass crops on contract acres within designated BCAP project areas.¹⁰ Eligible land for BCAP project area contracts includes agricultural land and nonindustrial private forestland, but does not include Federal or state-owned land, or land that is native sod. Lands enrolled in existing land retirement programs for conservation purposes—the Conservation Reserve Program (CRP) or the Agricultural Conservation Easement Program (ACEP)—also become eligible during the fiscal year that their land retirement contract expires. Generally, crops that receive payments under title I, the commodity title, of the farm bill (*e.g.*, corn, wheat, rice, and soybeans), plus noxious weeds and invasive species are not eligible for annual payments.

Matching payments are available to eligible material owners who deliver that material to qualified biomass conversion facilities. Eligible material must be harvested directly from the land and separated from a higher-value product (*e.g.*, title I crops). Invasive and noxious species are considered eligible material, and land ownership (private, state, Federal, *etc.*) is not a limiting factor to receive matching payments.

Despite initial challenges, this program remains crucial to developing the feedstocks necessary for the biobased economy. The program's regionally appropriate biomass feedstocks are key to the development of sustainable systems for biofuels, renewable chemicals, and biobased products.

BCAP has incentivized nearly 1,000 growers and landowners farming nearly 49,000 acres to establish and produce dedicated, non-food energy crops for delivery to energy conversion facilities.¹¹ In 2014 and 2015, USDA approved 209 contracts for matching payments of \$15.8 million toward the collection or harvest of approximately 300,000 dry tons of forest residues from National Forest Service and Bureau of Land Management public lands. Forest residues are removed for the reduction

⁷USDA National Institute of Food and Agriculture BRDI <https://nifa.usda.gov/funding-opportunity/biomass-research-and-development-initiative-brdi>.

⁸*Ibid.*

⁹USDA BCAP <https://www.fsa.usda.gov/programs-and-services/energy-programs/BCAP/>.

¹⁰See FSA, USDA, “BCAP Project Area Information,” at <https://www.fsa.usda.gov/programs-and-services/energy-programs/BCAP/bcap-project-area/index>.

¹¹Biomass Crop Assistance Program (BCAP) Qualified Biomass Conversion Facilities (BCF's) FY 2017 <https://www.fsa.usda.gov/Assets/USDA-FSA-Public/usdfiles/Energy/BCAP%20Facility%20Listing%20FY2017.pdf>.

or containment of disease or insect infestation and reduction of wildfire threat, the last of which is a significant threat to the Western U.S.¹²

The 2018 Farm Bill extended BCAP through FY 2023 and expanded the definition for eligible material to include algae. Unfortunately, the 2018 Farm Bill provided no mandatory funding for the program. Discretionary funding of \$25 million was authorized to be appropriated for each of FY 2019–FY 2023. No discretionary funding was provided for FY 2020.

Recommendations

When well-funded, BCAP has the potential to be a huge benefit to the development of the biobased economy and to farmers and agricultural producers looking to diversify their income streams. We urge the Committee to support full annual discretionary funding of BCAP at \$25 million for FY 2020–2023.

Section 9011 Carbon Utilization and Biogas Education Program

This new program was established in the 2018 Farm Bill and requires the Secretary to award competitive grants to eligible entities for two purposes:

1. education to the public and biogas producers about the benefits of carbon utilization and sequestration; and
2. education about the opportunities to aggregate multiple sources of organic waste into a single biogas system.

The 2018 Farm Bill provided no mandatory funding for the program but authorized discretionary funding of \$2 million annual for each of FY 2019–FY 2023. No funds have been appropriated through FY 2020.

Recommendations

While anaerobic digestion technology is mature, greater deployment throughout the rural economy has been slowed due to a lack of awareness and farmer education about how they work and their benefits. Digesters are one of the greatest methods available to trap methane emitting waste products such as manure and crop residues and convert it to renewable energy, nutrient-rich soil amendments, fertilizers, renewable natural gas, and feedstocks for renewable chemicals and bioplastics. Providing greater education and outreach to farmers and agricultural producers could greatly increase the deployment of digesters as well as the utilization of farm bill energy title programs that support digesters. We urge the Committee to support fully funding the \$2 million authorized annually for this program.

Biogas Opportunities Task Force

Language directing USDA, EPA and DOE to establish an Interagency Biogas Opportunities Task Force (building upon the existing Biogas Opportunities Working Group) was contained in the conference report accompanying the 2018 Farm Bill.

This provision states that no later than 180 days after the date of enactment of the Agriculture Improvement Act of 2018, the USDA Secretary in coordination with the Secretary of Energy and the EPA Administrator will establish an Interagency Biogas Opportunities Task Force to coordinate policies, programs, and research to accelerate biogas research and investment in cost-effective biogas systems.

The Task Force is to be composed of the head of each Federal office responsible for biogas research or biogas system financing, including a representative from the Department of Agriculture, the Department of Energy, the Environmental Protection Agency (EPA), and National Renewable Energy Laboratory. The Task Force will also have one or more representatives of state or local governments, one or more nongovernmental or industry stakeholders, and a community stakeholder.

The Task Force will evaluate and improve the coordination of loan and grant programs of the Federal agencies represented on the Task Force to broaden the financing options available for biogas systems. It will also explore how to enhance opportunities for private financing of biogas systems; review Federal procurement guidelines to ensure that products of biogas systems are eligible for and promoted by applicable procurement programs of the Federal Government; evaluate the development of North American Industry Classification System and North American Product Classification System codes for biogas and biogas system products; review opportunities and develop strategies to overcome barriers to integrating biogas into electricity and renewable natural gas markets; develop tools to broaden the market for non-energy biogas system products; provide information on the ability of biogas system products to participate in markets that provide environmental benefits; identify

¹²USDA Resumes Incentives to Grow the Bioeconomy and Improve Forest Health. https://www.fsa.usda.gov/news-room/news-releases/2016/nr_20161110_rel_185.

and investigate research gaps in biogas and anaerobic digestion technology; including research gaps in environmental benefits, market assessment; and performance standards; assess the most cost-effective voluntary investments in biogas to reduce waste and methane emissions; and identify and advance additional priorities, as determined by the Task Force.

Not later than 18 months after the date of the establishment of the Task Force, the Task Force will submit to Congress a report that identifies whether it was able to carry out the duties outlined above and include recommendations on how Congress should prioritize policies and technological opportunities, aimed at expanding the biogas industry. The report will also consider recommendations on how to eliminate barriers to investment in biogas systems in the landfill, livestock, wastewater, and other relevant sectors; and to enhance opportunities for private- and public-sector partnerships to finance biogas systems. Two years after the establishment of the Task Force it will identify, collect, and analyze environmental, technical, and economic performance data relating to biogas systems, including the production of energy from biogas systems, co-products, greenhouse gas and other emissions, water quality benefits, and other data necessary to develop markets for biogas and biogas system co-products. The data will be made public.

To date, this language has not been acted upon. We have been told by USDA Administration that unless the language is statutory or unless Congress provides additional funding to implement this provision that it will continue to be ignored.

Recommendations

Implementation of the Biogas Opportunities Task Force will help drive research, collaboration, innovation, education, outreach and deployment of anaerobic digestion technologies. As the Biogas Opportunities Working Group recognized, these technologies help turn agricultural challenges into opportunities by converting manure and other agricultural wastes into renewable energy, nutrient-rich soil amendments, fertilizers, a renewable natural gas, and even feedstocks for renewable chemicals and bioplastics.¹³ We urge the Committee to support this language and work with the Agency to oversee its implementation.

Non-USDA/Non-Farm Bill Programs

Renewable energy production plays a key role not just in agricultural policy, but also in energy, tax, and environmental policy. As a result, many of the Federal programs that support renewable energy production in general, and agriculture-based energy production in particular, are outside the purview of USDA and have origins outside of omnibus farm bill legislation. The Renewable Fuel Standard, for example, was established outside of farm bill legislation.

The Renewable Fuel Standard

The RFS mandates an increasing volume of biofuels use and has its origins in the Energy Policy Act of 2005 (P.L. 109–58). The RFS was expanded in the Energy Independence and Security Act of 2007 (EISA; P.L. 110–140) and divided into four distinct, but nested, biofuel categories—total, advanced, cellulosic, and biodiesel—each with its own mandated volume. Biogas qualifies as both a cellulosic and advanced biofuel, depending on the feedstock. In fact, biogas makes up well over 90% of the annual cellulosic volumes. Additionally, biogas from non-cellulosic feedstocks such as food waste is a growing category. While not a USDA administered program, the RFS significantly impacts the on-farm and rural economy because it can be a significant source of revenue to farms when administered properly by EPA. Additionally, USDA recommendations assist in the calculations of annual renewable fuel volume targets. When the RFS is being administrated well and running smoothly, it provides an additional stream of income that can help buffer the effects of on-going trade disputes or the impacts of bad weather. When the RFS is being administered poorly, it can add to the farmers and agricultural producers' woes.

Waivers

We strongly argue that the continued abuse of the small refinery exemptions undermines the integrity of the RFS and is in direct contravention of the statute passed by Congress in 2007. We urge the EPA to limit the use of these waivers to only their intended purpose.

¹³Biogas Opportunities Roadmap, *Voluntary Actions to Reduce Methane Emissions and Increase Energy Independence*, August 2014. https://www.energy.gov/sites/prod/files/2014/08/f18/Biogas%20Opportunities%20Roadmap%208-1-14_0.pdf.

Biomass Derived Renewable Electricity

When reauthorized and expanded through the Energy Independence and Security Act of 2007 (EISA; P.L. 110–140), Congress included electricity made from renewable biomass as part of the fuel mix in the RFS. One of the main goals of the RFS is to incentivize the development and deployment of new American produced biofuels, which will create energy independence and new markets for producers including the electricity produced from biomass.

Furthermore, EPA included electricity derived from biogas in the Renewable Fuel Standard Program.¹⁴ Yet, while numerous applications to generate biogas derived electricity have been submitted, none have been approved. The EPA has yet to set up the processes necessary for producers to generate Renewable Identification Numbers (RINs). As shrinking markets and trade wars increasingly strap small farmers, the revenue that they should generate from the sale of these e-RINs may be the difference between shutting down and staying open.

Building electricity into the RFS is not a way to incentivize electric vehicles. One may only look to how the ethanol market works to understand. The producer of ethanol receives the RIN credit for fuel blended into the larger gasoline supply. This in no way encourages or discourages the use of traditional vehicles; it simply ensures the producer of biofuels gets the credit to which they are entitled under the RFS. The same applies to renewable electricity powering electric vehicles. Biofuels, such as the biogas produced from anaerobic digesters, are already being “blended” into the electricity supply but the producers of these biofuels are not able to receive the RINs credit. The use of the biogas, which consists of methane and carbon dioxide, as a fuel to generate renewable electricity helps improve our air quality, water quality, soil health, and the environment while mitigating the effects agricultural production has on our climate.

Incorporating electricity into the RFS is also not a threat to ethanol producers. The majority of the fuel would be added to the cellulosic biofuel category (D3 RIN), which is separate from the ethanol market’s D6 RIN.

Recommendations

If Congress is looking for a way to help farmers during the time of trade wars, competing interests of the oil industry, and the effects of [COVID-19], supporting the RFS would be an ideal way of doing so. Ensure the integrity of the RFS by only granting waivers to those small refiners who truly qualify. We also ask Congress to uphold the letter and intent of the RFS by directing EPA to include renewable biomass derived electricity to the annual blending requirements. Agricultural producers should be allowed to participate in the RFS as Congress originally intended, and it would help producers stay afloat even with other uncertainties.

Tax Policy

While Tax Policy is underneath the jurisdiction of the House Ways and Means Committee, it nevertheless affects on Farm Energy Production. Biogas produces firm, reliable baseload power that can be easily incorporated into existing energy infrastructure. Power from biogas and other baseload technologies is critical to the stability of the nation’s electric grid, creates high-paying jobs, and helps the country meet its environmental and energy policy objectives.

Biogas qualifies for the Section 45 Production Tax Credit (“PTC”) at a ½ credit rate. The PTC lapsed on December 31, 2016. The Bipartisan Budget act retroactively extended the PTC for 2017 was expired for 2018 and 2019. In late December of 2019, this credit was extended retroactively in the FY 2020 Appropriations bills for 2018 and 2019 and for 1 year in the future, 2020. The temporary nature of the incentive combined with the long project lead times have historically limited the efficacy and utilization of the incentive for biogas. The ability of other renewable technologies to readily utilize the PTC and the Section 48 Investment Tax Credit (“ITC”) while our technologies have effectively been denied similar tax treatment under current law has had the practical impact of putting this otherwise economically competitive technology at a distinct competitive disadvantage in the energy marketplace.

Recommendation

To provide parity in tax policy and energy markets, technologies whose eligibility for the PTC and the ITC has been intermittent should be eligible for the same tax treatment that has been afforded other renewable energy technologies. We strongly urge this Committee to support the extension of the Production Tax Credit (PTC)

¹⁴ Approved Pathways for Renewable Fuel <https://www.epa.gov/renewable-fuel-standard-program/approved-pathways-renewable-fuel>.

(§§ 45 and 48(a)(5)) for Renewable Electricity and the expansion of the Investment Tax Credit for Biogas §48 for biogas properties. Biogas property has been defined as property that converts biomass into a gas (which is at least 52% methane) for productive use. Electricity produced from property receiving an ITC under this provision is not also eligible for benefit under the PTC. We also ask that this Committee support the extension of the alternative fuel excise tax credit and the effort to provide an Elective Payment for energy property and electricity produced from certain renewable sources. These four tax policy recommendations were contained in the *Moving Forward Act* (H.R. 2), which was recently passed by the House.

House Select Committee on the Climate Crisis

The House Select Committee on Climate Crisis recently released its Action Plan for a Clean Energy Economy and Healthy, Resilient, and Just America. This wide ranging forward looking plan outlines many policy priorities including many under the jurisdiction of this Committee. In general, the ABC is supportive of the recommendations contained within this report and believes that if implemented, we can transition our economy to a more sustainable model which values workers and forward-thinking agricultural producers, advances sustainable environmental policies and goals, and is prepared to meet the challenges of the climate crisis.

Conclusion

The production of On-Farm Energy is driven by numerous factors included among them is policy formulated by this Committee. Farm bill energy title programs have been incredibly successful in growing the on-farm and rural economy. Because of the research, loans, and grants provided by these programs, biogas and biotechnology companies are developing new technologies and feedstocks for the conversion of biomass for the production of renewable energy, advanced biofuels, renewable chemicals, renewable fertilizers and biobased products.

The biogas industry is on the cusp of creating a robust biobased economy through U.S. biobased production, which strengthens rural and on-farm economies. Biogas systems encompass a value chain from agriculture through the manufacture of consumer goods that provides a cost-competitive alternative to petroleum's value chain and brings environmental, economic and other benefits.

Encouraging growth of our industry provides new markets for farmers and agricultural producers, promotes innovation in domestic manufacturing and exports, and stimulates sustainable economic growth. In turn, because the inputs and technologies are domestically developed, this sector will boost the incomes of America's farmers, revitalize rural communities, create high-skilled jobs in the manufacturing sector, and provide sustainable employment.

The ABC and the AgEnergy Coalition are ready to serve as a resource to the Committee and you continue to support On Farm Energy Production. Please do not hesitate to call on our organizations if we can be of service.

The CHAIRMAN. Thank you very much, Mr. Sievers.

And now, I recognize Mr. Will Harris, for 5 minutes, from Georgia.

STATEMENT OF WILL HARRIS, OWNER, WHITE OAK PASTURES, BLUFFTON, GA

Mr. HARRIS. Chairman Scott, Ranking Member Scott, and Members of the Subcommittee, thank you for inviting me to be here today.

White Oak Pastures is a 153 year old family farm that geographically surrounds our town of Bluffton, Georgia. It is a vertically integrated, multi-generational farm where we utilize multi-species rotational grazing practices, produce beef, pork, lamb, poultry, eggs, organic vegetables, and honey. The fourth, fifth, and sixth generation of the Harris family are currently living and working on the farm.

There are three topics I want to cover with you today: regenerative farming as an economic driver; and as a tool to help mitigate climate change; and paired with renewable energy, to create more economic opportunities for rural America.

First, as an economic driver. Every conscious American recognizes the decay that has occurred in rural communities over the last half century. Prior to World War II, most rural communities enjoyed a fairly consistent agrarian economy. But after the war, the centralization of our food processing system began, and new mega-plants, owned by large multinational companies started to starve out small, hometown, locally-owned processing businesses.

When I was growing up in rural Georgia in the 1960s, every county had at least one family-owned slaughter plant. Today, almost every one of these is gone from our 159 county state. And this is a tragedy being replicated all across the United States.

Regenerative farming at White Oak Pastures has revitalized the economy of our county, and it can do the same for other communities across the nation. White Oak Pastures is the largest private employer in our county. In the last 20 years, our farm has grown from four full-time employees and \$1 million in annual revenue, to 155 full-time employees and \$20 million in annual revenues. We write payroll checks for over \$100,000 every week, in a county that has fewer than 3,000 residents. The average salary of our employees is almost twice that of the average employee in the county. There could, and should, be a White Oak Pastures in every agricultural county in the United States. It is a highly replicable business model.

Second topic is regenerative ag farming to mitigate climate change. This has been scientifically proven by the lifecycle assessment, and I provided the link to that in my written comments. White Oak Pastures may be the only farm in the world that has a peer-reviewed, third-party scientific study that verifies and validates that we sequester more carbon than we emit. We are a contributor to the mitigation of climate change.

Our farm has sequestered over a ton of carbon per acre per year on 3,200 acres of land for the last 20 years. During this period of time, our farm has pulled the carbon equivalent of almost ½ million barrels of crude oil out of our atmosphere and sequestered it in the soil. White Oak Pastures used a \$50,000 USDA REAP Grant to construct a 50,000-watt solar array in 2010. It provides our farm with energy resilience and helps power our on-farm red meat and poultry slaughter plants, both of which are USDA-inspected.

A couple of years ago, I learned that Silicon Ranch, one of the largest owner-operators of solar power plants in the country, would be building a solar array on over a thousand acres of land next to my farm. I invited my new neighbors to visit, and during the visit, we discussed the opportunity for a mutually beneficial partnership: I would use my livestock and regenerative farm practices to manage the vegetation on their solar farm. It worked. White Oak Pastures will be bringing regenerative land management to 2,400 acres of solar farmland in southwest Georgia. Twenty years from now, Silicon Ranch's land will have five percent organic matter, just like mine does. The White Oak Pastures-Silicon Ranch partnership model is replicable anywhere. It is win-win for the solar developers and farmers and rural communities.

Adding regenerative cattle grazing to the model would greatly expand the opportunity. Integrating cattle grazing over these large-

scale solar farms is not an option without more research and development.

In partnership with the National Renewable Energy Lab, White Oak Pastures and Silicon Ranch have applied to work with the Department of Energy through a grant to construct a prototype on my land to power my slaughter facility. It will demonstrate cattle and solar compatibility.

White Oak Pastures is honored to have been able to transform renewable energy into regenerative energy. I want to thank the Members of the House Agriculture Committee for giving me the opportunity to share our story today. It is a story of hope and innovation, and a story of how we can bring prosperity back to impoverished rural America. Thank you very much.

[The prepared statement of Mr. Harris follows:]

PREPARED STATEMENT OF WILL HARRIS, OWNER, WHITE OAK PASTURES, BLUFFTON, GA

Chairman Scott, Ranking Member Scott, and Members of the Subcommittee, thank you for inviting me to be here today—

White Oak Pastures is a 153 year old radically traditional family farm that geographically surrounds the town of Bluffton, Georgia. It is a vertically integrated, multi-generational farm that uses the multi-species rotational grazing practices of our forefathers to produce beef, pork, lamb, poultry, goat, eggs, organic vegetables, and honey. We have not used pesticides, chemical fertilizers, tillage, or GMO's in the last 20 years and we operate as a zero waste facility. The fourth, fifth, and sixth generation of the Harris family are currently living and working on the farm.

There are three topics that I want to cover today that I hope you will consider to be important:

1. Regenerative Farming as an Economic Driver
2. Regenerative Farming as a Tool To Help Mitigate Climate Change
3. Regenerative Farming Paired With Renewable Energy To Create More Economic Opportunities for Farmers and Rural America

First, regenerative farming is an economic driver, proven as a workable business model in Bluffton, Georgia—

Every conscious American has some level of recognition of the decay that has occurred in our rural communities in the last half century.

Prior to World War II, most rural communities enjoyed a fairly constant agrarian economy.

But after the war, the centralization of our food processing system began, and new mega-plants, owned by large multinational companies and operated with great “economic efficiency” started to starve out our small, hometown, locally-owned and operated processing businesses.

When I was growing up in rural Georgia in the 1960s, every county had at least one family-owned abattoir [artisan slaughter plant]. Today, almost every single one is gone from our 159 county state. And this tragedy has been replicated across the rural United States.

Regenerative farming at White Oak Pastures has revitalized the economy in our county, and it can do the same for other communities across this great nation.

White Oak Pastures is the largest private employer in our county. In the last 20 years, our farm has grown from four full time employees, and a million dollars in annual revenue, to 155 full time employees, and twenty million dollars in annual revenues. We write payroll checks for over \$100,000 each week, in a county that has fewer than 3000 residents. The average salary of our employees is approximately twice that of the average salary in the county.

There could, and should, be a White Oak Pastures in every agricultural county in the United States. Maybe two or three of them. It is a highly replicable business model.

And now for the second topic I wish to share with you all today. regenerative farming helps to mitigate climate change, proven scientifically by the life cycle assessment that I have provided for you—

<https://blog.whiteoakpastures.com/hubfs/WOP-LCA-Quantis-2019.pdf?hsCtaTracking=6d515b16-e2ed-4bea-a286-a7433c983b81%7C7a0781f6-8e32-4e28-89e9-563565ab2eea>

White Oak Pastures is likely the only farm in the world that has a peer reviewed, third-party scientific study that verifies and validates that we sequester more carbon than we emit. We are a contributor to the mitigation of climate change.

The organic matter of our soil has increased from 0.5% to 5.0% over the last 2 decades. Each 1% of organic matter will absorb over 20,000 gallons of water. Our 3,200 acres of land will absorb a 5" rain event. The neighboring farms can only absorb a ½" rain event, which has enormous downstream impact.

Our farm has sequestered over 1 ton of carbon per acre per year, on 3,200 acres of land, for the last 20 years. During this period of time, our farm has pulled the carbon equivalent of about 500,000 barrels of crude oil out of our atmosphere.

White Oak Pastures used a \$50,000 USDA-REAP Grant to construct a 50,000 kW solar array in 2010. It provides our farm with energy resilience and helps to power our on-farm red meat and poultry slaughter plants, both USDA-inspected.

While this on-site solar array introduced us firsthand to the benefits of renewable energy, for my third topic I want to share how regenerative farming paired with renewable energy creates even more economic opportunities for rural America—

A couple of years ago, I learned that Silicon Ranch, one of the largest owner-operators of solar power plants in the country and the leader in our state of Georgia, would be building a solar farm on over a thousand acres of land next to my operations. I liked solar, but I didn't like what it typically meant for the land it occupied—un-natural, unhealthy monoculture—and dead dirt.

I invited my new neighbors to visit. And during the visit, we discussed the opportunity for a mutually beneficial partnership: I could use my livestock and regenerative farming practices to manage the vegetation on Silicon Ranch's solar farm—a big operational challenge for them usually managed with mowing and spraying—and at the same time I could access more grazing land without additional investment and improve my bottom line.

Following months of collaborative discussions, White Oak Pastures has formed a meaningful partnership with Silicon Ranch, and they have transformed their approach to managing the land under their arrays across the country.

For our part, White Oak Pastures will be bringing regenerative land management to close to 2,400 acres of solar farm land in southwest Georgia. Twenty years from now, Silicon Ranch's land will have five percent organic matter like mine does and even more economic value per acre by layering clean energy generation, food production, and ecosystem services.

The White Oak Pastures-Silicon Ranch partnership model is replicable anywhere willing farmers and solar energy intersect. Solar is a decentralized form of power generation that can support the decentralization of agriculture by providing regenerative farmers with finance-free access to land and a new source of income. The co-location of renewable energy generation and regenerative agricultural production is a win-win-win: for the solar developers, the farmers, and the community.

And the replication process has already begun: Silicon Ranch has replicated this model in Mississippi, Tennessee, Arkansas, and Colorado, and will be implementing it in additional states in the coming years.

To date, Silicon Ranch's co-location model has integrated regenerative sheep grazing, as well as pasture-raised poultry, on its solar farms. This innovation has created a unique and significant opportunity for farmers and rural America.

Adding regenerative cattle grazing to the model would greatly expand this opportunity to even more farmers and communities because cattle are by far the most widely consumed ruminant in the country. Nearly ¼ of all land in the U.S. is dedicated to cattle grazing.

Integrating cattle grazing on large-scale solar farms is not an option without new research and development due to current solar power plant design and limitations related to the financing of untested new designs.

In partnership with the National Renewable Energy Lab and experts from three renowned academic research institutions, White Oak Pastures and Silicon Ranch have applied to work with the Department of Energy, through a grant from the Solar Energy Technologies Office, to custom build a 250kW Outdoor Test Lab on my land to power my USDA slaughter facility, and to demonstrate cattle and solar compatibility. If the DOE awards our grant application it would be yet another example of how targeted Federal programs can help support innovation and progress to advance the mission of our family farm.

Moreover, if our Test Lab is successful, Silicon Ranch intends to scale and replicate this new model, the CattleTracker model, across the country, keeping even more land in ag production while supporting and leading the transition to clean energy.

White Oak Pastures is honored to have helped Silicon Ranch transform “renewable energy production” into “regenerative energy production” and we look forward to expanding the positive impacts of energy projects through building a CattleTracker project on our farm.

I want to thank the Members of the House Agricultur[e] Committee for giving me the opportunity to share our story today. It is indeed a story of hope and innovation, and it is a story of how we can bring prosperity back to impoverished rural America. Thank you.

WILL HARRIS, *Owner*, White Oak Pastures.

ATTACHMENT



Quantis

CARBON FOOTPRINT EVALUATION
OF REGENERATIVE GRAZING AT
WHITE OAK PASTURES

RESULTS PRESENTATION

Prepared for:

 **General Mills**
Making Food
People Love

+

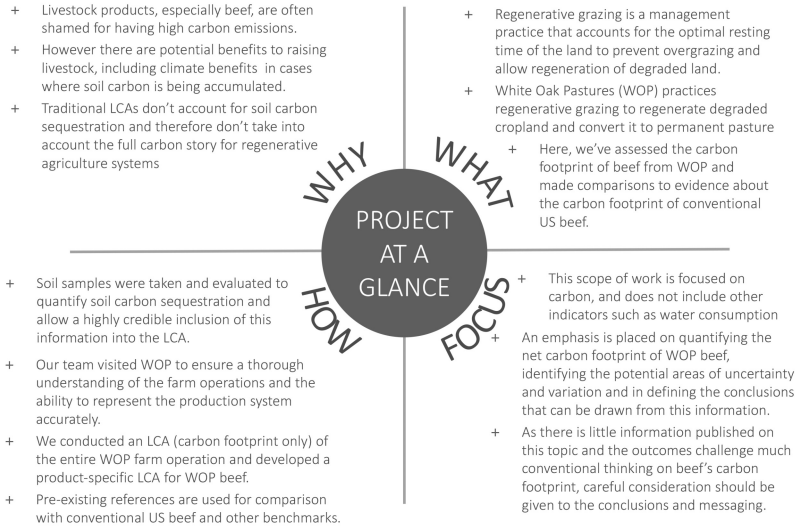
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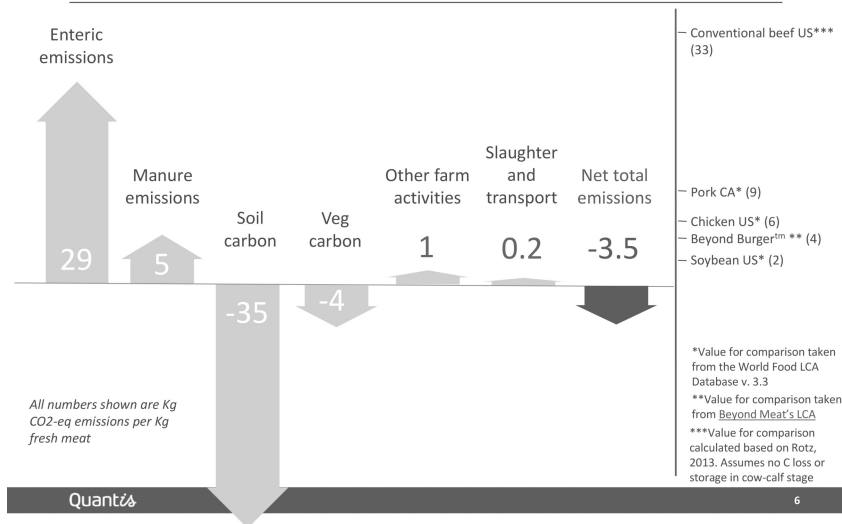
February 25th, 2019



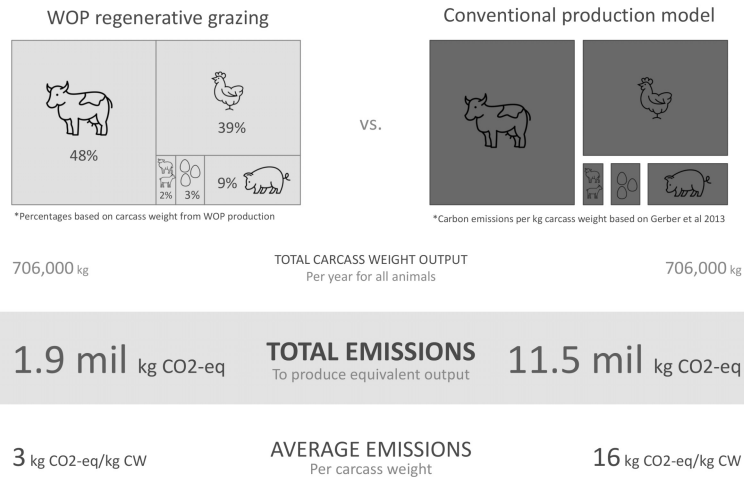


WHAT WE FOUND	SO WHAT	NOW WHAT
<ul style="list-style-type: none"> + The net result is that WOP beef has a carbon footprint 111% lower than a conventional US beef system. + The WOP system effectively captures soil carbon, offsetting a majority of the emissions related to beef production. + The largest emission sources—from cattle digestion and manure—are highly uncertain. We believe the results shown here are on the conservative side. 	<ul style="list-style-type: none"> + Regeneratively grazed beef, can likely escape the stigma of extremely high carbon emissions attached to conventional beef. + Accounting for soil carbon capture is not yet standard practice and the results may meet with challenges, such as on ensuring long-term storage. + In the best case, the WOP beef production may have a net positive effect on climate. The results show great potential. 	<ul style="list-style-type: none"> + There is a great positive story to tell at WOP and on the potential for regenerative grazing as a carbon solution. General Mills, Epic and WOP should consider how to tell this story to ensure brand enhancement, minimizing brand risk and having a positive influence + Following this preliminary assessment, there are several potential paths for future exploration. There are uncertainties to be addressed regarding enteric emissions and long-term carbon storage. There are also other areas of benefit to consider such as land use, water use and water pollution.

Carbon footprint breakdown per kg of White Oak Pastures' beef



WOP's integrated system is 6 times more carbon efficient than North American average production systems for the equivalent amount of carcass weight





2 | Introduction

Project rationale

Livestock production is often implicated as the **largest contributor to environmental issues** related to the food system (especially climate change, water use, nutrient cycling, antibiotic resistance, land use, etc.).

The concept of regenerative grazing, which has been shown to significantly increase soil carbon content by drawing carbon from the atmosphere, is leading some people to question whether the carbon footprint of grass-grazed meat is as high as is often published or if alternative production systems could have a significantly more positive story. Some evidence has emerged that there is a potentially a net-positive impact to raising meat with regenerative practices.



What is Regenerative Grazing?

The concept of regenerative grazing (also known as holistic planned grazing or holistic management) is rooted in the “law of the second bite”. Conventional grazing systems typically lead to overgrazing, by allowing grazing animals to take a “second bite” of a plant before that plant has had time to recover from the first bite. This, combined with other factors, leads to degenerated land.

In carefully and well managed grazing, the land is allowed to rest for an optimal amount of time before the grazing animals are allowed to return to that spot. This allows the grasses to build up their root structure. The complex relationships and interactions between soil microbes, plant roots, and grazing animals allow for a net sequestration of carbon in the soil.

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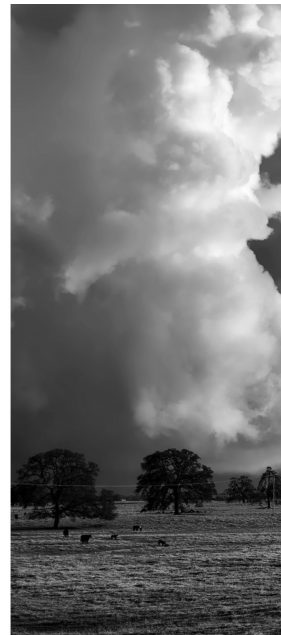
Intro to White Oak Pastures (WOP)

WOP is a 3000 acre family farm in Bluffton, Georgia. Originally a conventional beef farm, 20 years ago they began the shift to regenerative grazing practices after Will Harris, the owner, became disenchanted by the industrial tools of the existing system.

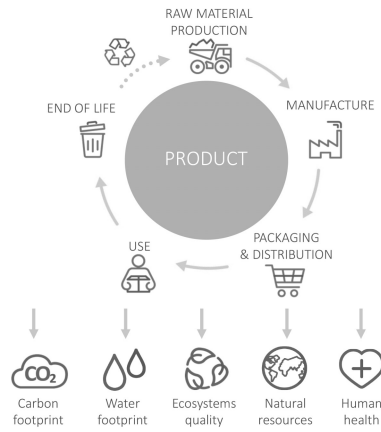
By converting annual cropland to perennial pasture, and a monoculture of cattle to a diverse range of animals, they are regenerating the health of the soil that has been heavily degraded from years of tillage, pesticide use, and monocropping. They now raise sheep, goats, hogs, poultry and rabbits in addition to cattle in an integrated farming system.

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What is Life Cycle Assessment (LCA)?



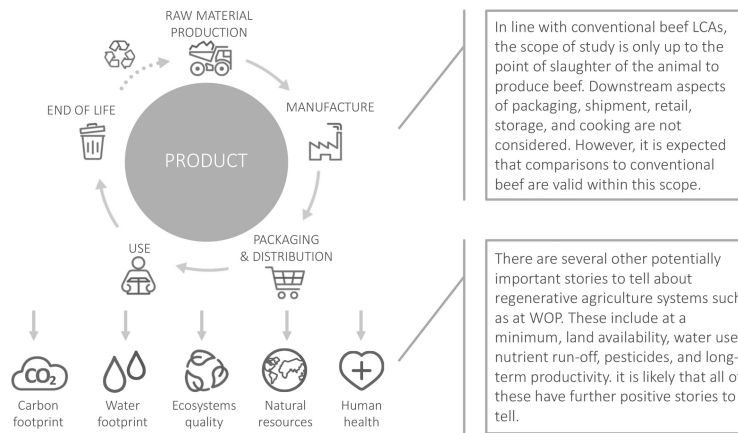
An LCA evaluates the total environmental impact of a product over its entire production (and/or consumption) chain, allowing for a comprehensive comparison of alternative ways of meeting human needs and economic functions.

LCA aims to avoid missing the important part of the environmental story by looking at all aspects of the system and by considering a wide range of environmental impact.

It's an ideal tool for directional comparisons and to support big-picture strategies and decision-making. It is not intended for site-specific environmental management or risk assessment.

LCA gives us a framework to think clearly about the sustainability of a given product or system. However, it alone cannot define benchmarks for what is sustainable or not. It usually omits societal impacts from consideration and may omit important environmental issues.

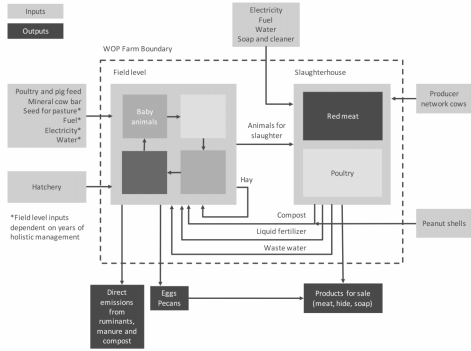
Here, we consider only carbon footprint of the production



In line with conventional beef LCAs, the scope of study is only up to the point of slaughter of the animal to produce beef. Downstream aspects of packaging, shipment, retail, storage, and cooking are not considered. However, it is expected that comparisons to conventional beef are valid within this scope.

There are several other potentially important stories to tell about regenerative agriculture systems such as at WOP. These include at a minimum, land availability, water use, nutrient run-off, pesticides, and long-term productivity. It is likely that all of these have further positive stories to tell.

Farm System Boundary



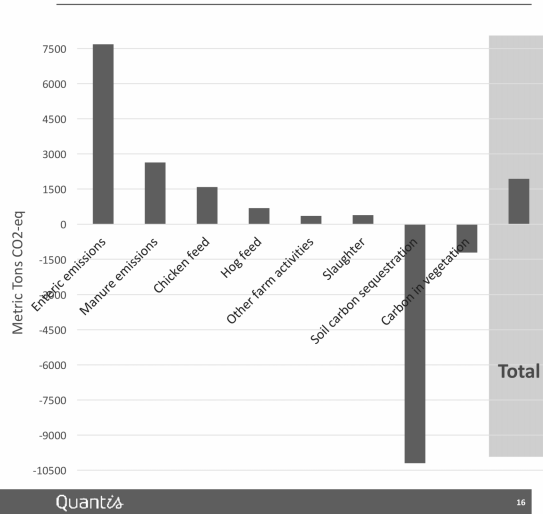
This study considered the full farm operations from field to slaughter for the year 2017

- The following were ignored from the LCA boundary
- Row crops/vegetable garden
 - Restaurant
 - Farm offices/cabins
 - Packaging waste for farm level inputs

3 | Results



Full farm carbon footprint of WOP

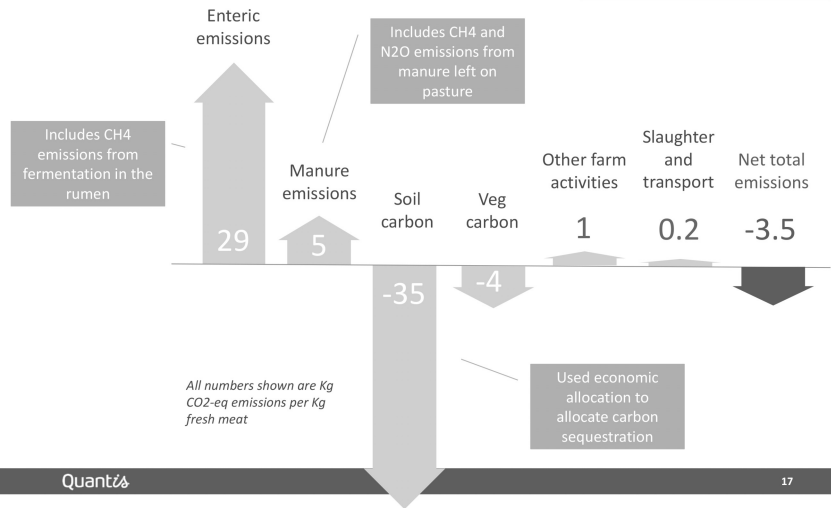


+Numbers shown here include emissions from all animals and all farm activities

+The WOP system effectively sequesters carbon, offsetting a majority (~85%) of the farm's total emissions

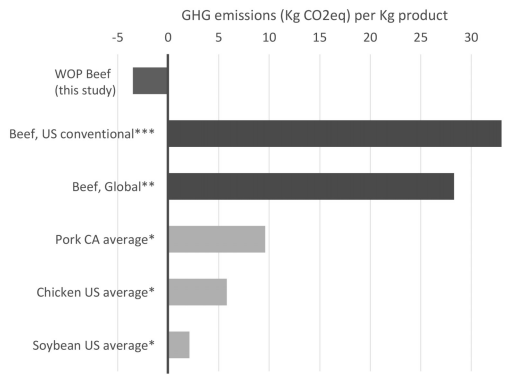
+For scale, the net total emissions of WOP in 2017 represents 0.01% of General Mill's F17 corporate footprint

Carbon footprint breakdown for WOP beef



Numbers shown here include only farm level activities and emissions that are directly related to beef production

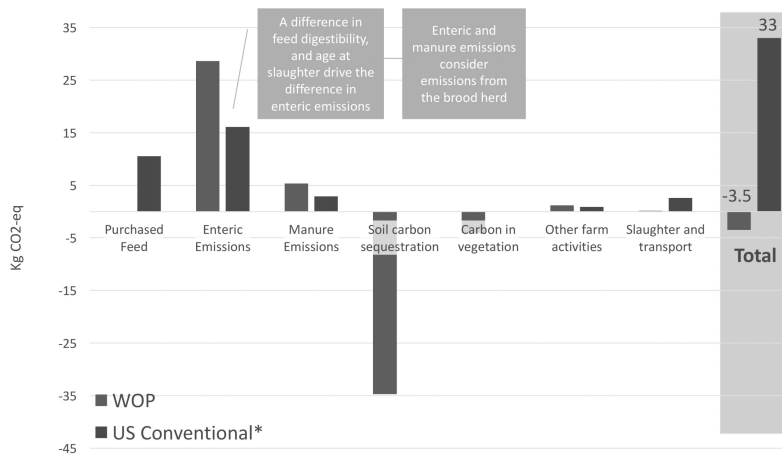
How does our result compare?



*Value taken from the World Food LCA Database v. 3.3
 ** Average of 20 published values summarized by Desjardins et al. 2012. "Carbon Footprint of Beef Cattle" in *Sustainability*, v4, p3279
 ***Value for comparison calculated based on Rotz, 2013

- + WOP's beef shows a much lower carbon footprint than conventional beef. It doesn't share the stigma of extremely high carbon emissions attached to conventional beef.
- + The most likely result is that WOP beef falls within, or even below the range of other protein sources.
- + At the best case scenario, rotationally grazed beef may be a very unusual case of having a net negative carbon impact from its production.

Comparison of WOP emissions to US conventional beef emissions per kg fresh meat

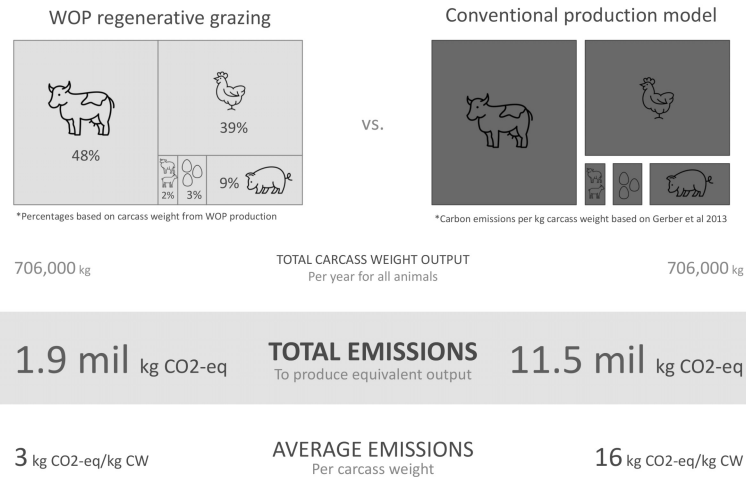


*Value calculated based on Rotz, 2013 for conventional beef

WOP and Rotz 2013 comparison

	WOP	Rotz 2013
Method	Grazing	Rotational grazing for cow-calf stage, Feedlot for finishing
Cattle age at slaughter	24 months	17 months
Average annual herd size	Breeding age females 1,200 Breeding bulls 60 Heifer/calves 200 Young steers 1,095 Slaughter age steers 500 Total 3,055	Breeding age females 5,498 Breeding Bulls 285 Replacements 1,180 Calves 5,050 Total 12,000
Average annual slaughtered heads	990	5050
Average weight at slaughter	520 kg	580 kg

WOP's integrated system is **6 times more carbon efficient** than North American average production systems for the equivalent amount of carcass weight



WHAT WE FOUND	SO WHAT	NOW WHAT
<ul style="list-style-type: none"> + The net result is that WOP beef has a carbon footprint 111% lower than a conventional US beef system. + The WOP system effectively captures soil carbon, offsetting a majority of the emissions related to beef production. + The largest emission sources—from cattle digestion and manure—are highly uncertain. We believe the results shown here are on the conservative side. 	<ul style="list-style-type: none"> + Regeneratively grazed beef, can likely escape the stigma of extremely high carbon emissions attached to conventional beef. + Accounting for soil carbon capture is not yet standard practice and the results may meet with challenges, such as on ensuring long-term storage. + In the best case, the WOP beef production may have a net positive effect on climate. The results show great potential. 	<ul style="list-style-type: none"> + There is a great positive story to tell at WOP and on the potential for regenerative grazing as a carbon solution. General Mills, Epic and WOP should consider how to tell this story to ensure brand enhancement, minimizing brand risk and having a positive influence + Following this preliminary assessment, there are several potential paths for future exploration. There are uncertainties to be addressed regarding enteric emissions and long-term carbon storage. There are also other areas of benefit to consider such as land use, water use and water pollution.
<p>Quantz</p>		<p>22</p>

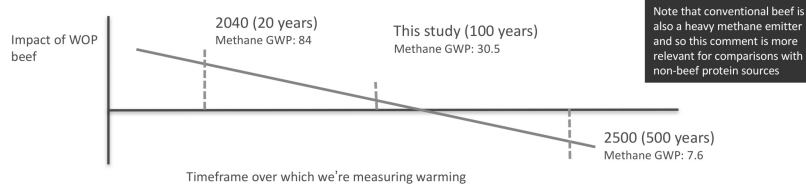
Why might the benefits be LESS than shown here?

The impact of methane may be underestimated if considering the critical 2050 period for achieving global targets.

We've used the IPCC's global warming potentials based on total warming within a 100-year timeframe (these are by far the most widely used GWPs).

Methane has a sharply higher warming potential for the first 10-20 years after it is emitted, after which it is removed from the atmosphere (12.4 year lifespan).

It is believed that the necessary period to reduce GHG emissions to avoid irreversible damage to many earth systems is in the coming 30-50 years.



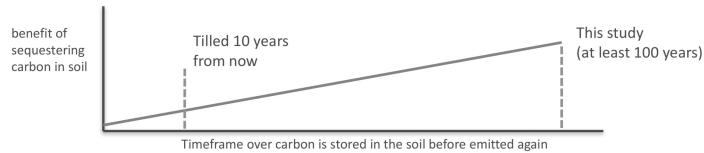
Why might the benefits be LESS than shown here?

The carbon sequestered could be re-emitted next year (or next decade)

When we emit carbon dioxide, we are sure that most of it will remain in the atmosphere for 100 years or longer.

However, when we take carbon from the atmosphere and store it in soil, we are less sure of how long it will be stored. Future management of the land will determine whether the carbon remains there and tilling the land for agriculture could re-release much of this carbon at any time.

It is therefore uncertain whether it is accurate to consider soil sequestration as the opposite of an emission.



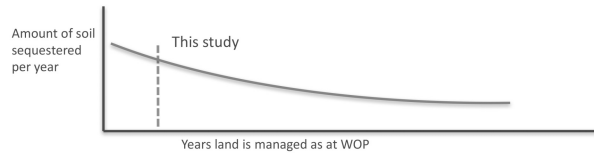
Why might the benefits be LESS than shown here?

The rate of carbon sequestration may slow as the soil becomes “carbon saturated”

We are starting from a point of very low organic carbon content in the soil, so there is very large room for improvement.

However, over time, some of the carbon in the upper layer of soil will be buried more deeply in the soil, while the surface layer will become saturated with carbon and accumulate carbon at a slower rate.

While the change in soil carbon measured here are credible, this amount of change may slow considerably in the coming decade or two.

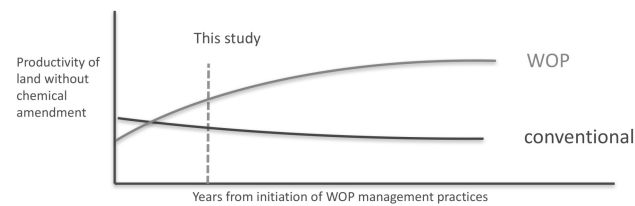


Why might the benefits be MORE than shown here?

We're not accounting for increased productivity of the land as soil carbon increases

The conventional beef model and the WOP model are both a snapshot of 1 year's production.

However, each year the WOP land becomes more fertile as soil carbon is restored and the land on which grain is grown for the conventional beef very likely has its fertility further depleted. Taking a longer term view (a few decades) would likely show that the efficiency of the WOP system continues to increase while the conventional system either decreases or requires increasing amounts of chemical treatment to sustain production.



Why might the benefits be MORE than shown here?

We could be over-estimating enteric methane emissions

There are relatively few direct measures of methane emissions rates from cattle while grazing in such systems. Some experts (e.g., J. Rowntree) believe that the IPCC references used here are likely to be an overestimate of the true enteric emissions.

We have erred on the conservative side for these results. If indeed overestimated, the results could show a more highly positive carbon emission benefit for WOP beef.

Why might the benefits be MORE than shown here?

We're only looking at the carbon emissions story

There are potentially many environmental benefits of the operation at WOP relative to conventional beef raising. These include:

- Reduced water use if avoiding the need to irrigate crop land
- Reduced nutrient runoff from fertilizer use on conventional crop land, or concentration of manure from confined feeding operations
- Reduced pesticide use on conventional crop land
- Increased natural habitat, depending on landscape of farm

There is a potential that the WOP production system could in net use a greater land area than the conventional feedlot production model, but initial estimates indicate that the total land area used per amount of beef may be similar between the two.

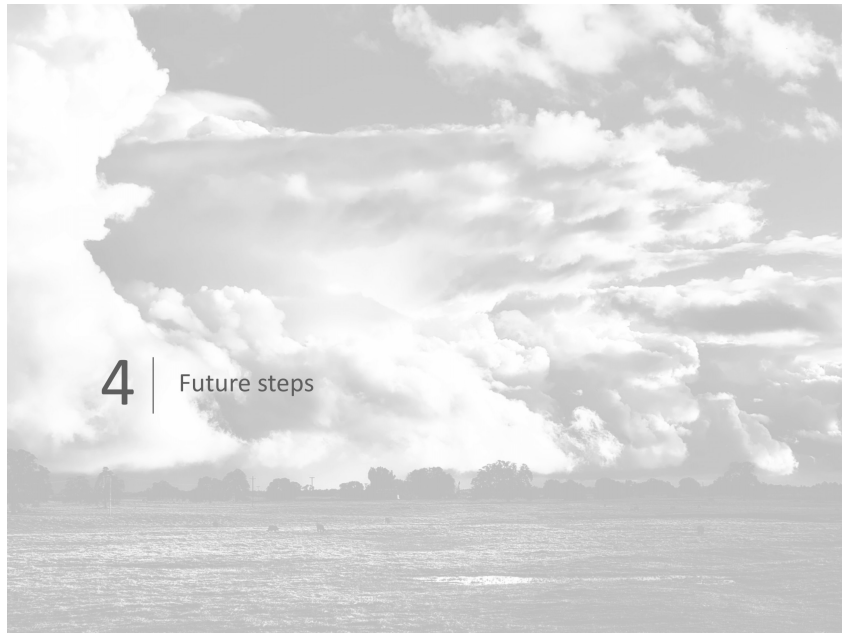
What can we say with confidence?

- The WOP beef is much, much better for net carbon emissions than conventional beef
- The WOP beef is potentially on-par or better than other non-beef protein sources with regard to its carbon footprint. It does not share the large negative carbon stigma of conventional beef
- Within our margin of error, there is a potential that the WOP beef production is *climate positive*. This would be very rare and it is unusual that there is more benefit to producing something than to simply not produce.
- There remain caveats about the certainty of these results, as explained in previous slides.

The story depends on the extent of the impact or benefit

If the carbon footprint of the beef is (Kg CO₂-eq)... ..then...

- 2-10** WOP beef is substantially better than conventional beef and there could be a large carbon benefit should these production practices replace the conventional beef production system.
- 0-2** WOP beef is a favorable protein source compared to other meats and potentially to dairy and vegetable proteins.
- <0** WOP beef is a rare climate-positive product and there could be a large net-positive carbon benefit should this production model replace degraded crop land.



Next Steps

- This study was prepared by Quantis with input and assistance from Dr. Steven Rosenzweig, General Mills Soil Scientist, Dr. Jason Rowntree, Associate Professor, Animal Science, Michigan State University and employees of White Oak Pastures in Bluffton, GA. Quantis to site LCA methodology here
- Major findings from this study were shared with Dr. Sasha Gennet and Dr. Clare Kazanski of The Nature Conservancy and Dr. Keith Paustian and Dr. Rich Conant of Colorado State University, who provided feedback on conclusions and statements.

Potential future steps to consider

- ISO compliant full LCA?
- Peer-review publication?

Any Questions?



The CHAIRMAN. Thank you, Mr. Harris. Let me just say that your testimony was very revealing, and I agree with you 100 percent.

Now, in your testimony you said so much, oh, I am sorry.

Mr. Harris, you got me so excited about what you were saying that I skipped the script. Thank you, Mr. Harris, and thank you, Ranking Member, for pulling my coattail on that.

I now recognize Dr. Mike McCloskey for 5 minutes.

STATEMENT OF MICHAEL J. McCLOSKEY, D.V.M., FOUNDER AND CHAIRMAN, FAIR OAKS FARMS; OWNER/PARTNER, PRAIRIES EDGE DAIRY FARM; CHAIR, ENVIRONMENTAL ISSUES COMMITTEE, NATIONAL MILK PRODUCERS FEDERATION, FAIR OAKS, IN

Dr. McCLOSKEY. Thank you, Mr. Chairman, and I want to thank also the Subcommittee Members for inviting us here today to be able to share with you our experience. Also, I would like to thank Congressman Baird for such a kind introduction today.

Listening to the previous colleague speakers today, I don't want to dwell a lot on past projects. It is clear that a lot of us over the years have heavily invested, our capital, on renewable energies on our farms, because we believe that is the right thing to do. And as we have done those investments, I want to assure you, and I think you have heard that from the other speakers, that the technology now is at a level that it is reliable and trustworthy, and that is the first thing that I hope this Committee fully embraces.

Therefore, our big challenge is how do we make it mainstream? How do we take what some of us who have scale who are able to take our capital and invest in and prove out these technologies, and now grow it for all industry?

In the dairy industry, for example, we as an industry through our trade organization, through our check-off dollars, we have come together and made a commitment to a net zero industry by 2050. We have a challenge for us to take everything that we have learned, that we know we can do, and drive it into all of our farms industry-wide. Now, this commitment is a collective commitment. Not everyone will hit net zero. Some people will sequester, as one of my colleagues just presented, which I agree 100 percent with. A lot of us will be able to sequester and do better than net zero. Some will hit net zero and some may not get to net zero. But as a collective industry, we have committed in the dairy industry that we are going to go to net zero.

Let me just take one big example that I believe that we can get there with your support, and some of this is truly outside of your jurisdiction. But it is your influence in Congress that can help create an atmosphere of investment in biogas, nutrient recovery, and clean water.

Let me start with the two main issues that we need to resolve is the need for helping with the capital costs. Chairman Peterson said it very well a little while ago. We need to find ways to help with these capital costs so we can take this mainstream, but there have to be ways that over time, we get out of that. And I am 100 percent for that comment. Let me explain what I mean here. We have to have an environment where we support an ITC, or an investment tax credit, of 30 percent for this type of equipment that deals with biogas, nutrients, and clean water. And an ITC, the way that it works, is when an industry is right, to be able to move forward, it can really stimulate thousands of jobs and self-pay for itself. An ITC credit is really not a cost. It actually brings additional money into the Treasury by creating thousands of jobs and creating an industry. This industry today is right to receive an ITC of 30 percent. I hope Congress can consider that, and I encourage you to.

I am not going to dwell a lot on USDA because my colleagues have expressed it very well. Through Rural Development, there are tremendous opportunities there, and also through NRCS. And the important thing there is to be able to stack these programs. We need to, and USDA has done a great job of that, but we still have states where we cannot stack different types of programs together to help medium size and small farmers participate. Those two things, an ITC and stacking, will be a tremendous help to be able to get small farmers, medium size farmers to be able to get capital to be able to invest in this technology.

The second thing that we need is a reliable market, and my colleagues also expressed the issues about reliable markets that have fallen apart over the years, and great projects therefore have disappeared. And we need to have a reliable market. Well again here, we have an example where we already have a reliable market and we haven't put it to work well enough, and that is through our Renewable Fuel Standard that lies there at EPA. We have a pathway, the electric pathway, that we need to put to use. By 2030, there will be a total of 20 million electric vehicles, including trucks, 18-wheeler trucks, on the road. And we can use this pathway, this electricity pathway through the RIN process and be able to sub-

sidize the income of the electric produced to these farmers in a fantastic way. If you do a conversion of a RIN, the renewable identification numbers, if you do a conversion that we are getting in gas today, where we are selling gas into the low carbon fuel standards, if that 77,000 BTUs, if you convert that into electricity, which I have, by getting a RIN that can move an electrical vehicle that is already in place, that we are not using, it sits there at EPA. By getting that amount of money coming back to the electrical generation would be sufficient to be able to justify that investment that the farmer could make. And we could take this whole concept from just people like ourselves who have scale, we could take this to the mainstream U.S. farmers to be able to take advantage of it.

I thank the Committee for listening to this. It is a simple future approach that we can have. By applying these two concepts, I believe we can get to more than 50 percent of our dairy industry commitment of a net zero by 2050. I believe we can be there by 2040, or even sooner if we can have support at this level.

Thank you very much.

[The prepared statement of Dr. McCloskey follows:]

PREPARED STATEMENT OF MICHAEL J. MCCLOSKEY, D.V.M., FOUNDER AND CHAIRMAN, FAIR OAKS FARMS; OWNER/PARTNER, PRAIRIES EDGE DAIRY FARM; CHAIR, ENVIRONMENTAL ISSUES COMMITTEE, NATIONAL MILK PRODUCERS FEDERATION, FAIR OAKS, IN

Chairman Scott, Ranking Member Scott, and Members of the Subcommittee, thank you for the opportunity to testify at today's hearing. My name is Mike McCloskey. Together with my partners, I milk over 15,000 cows in the great State of Indiana. Thanks to the many days I spent as a young boy accompanying my veterinarian uncle on farm visits, I learned to understand and appreciate the blessings that animals provide us. My love and fascination with animal agriculture culminated in a successful and respected dairy-centric veterinary practice in Southern California through the 1980s. Here, I partnered in my first dairy farm of 300 cows, and from there continued to grow while also founding the nation's sixth largest dairy cooperative, Select Milk Producers, and the dairy-based health and wellness brand, fairlife. I am also proud to serve as Chairman of the Environmental Issues Committee within the National Milk Producers Federation, which represents the nation's dairy farmers and the cooperatives they own.

In 2002 we installed our farm's first digester, processing both our cows' manure along with local pre-consumer food waste into electricity that we use on our farms. In 2009, we built a second digester with the purpose of creating a renewable biogas to be used in transportation. Through key partnerships with Cummins, Kenworth, and the State of Indiana, and with the majority of funding coming from private investment, we pioneered the first commercial fleet of 42 tractor trailers running on renewable compressed natural gas from biogas, hauling milk from our farms to processing facilities up to 350 miles away. Every year since beginning the operations from that digester, we have displaced 2,000,000 gallons of diesel from having to be mined as fossil fuel.

In 2019, as technology improved the cost and efficiency of anaerobic digesters, we replaced our first electricity-providing digester. The concept remains the same: microorganisms in the digester break down the waste, thereby producing methane and carbon dioxide. However, now we power a 1-megawatt generator. This digester operates around the clock and provides enough electricity to power about 900 homes. Our digesters are integral to our farm's environmental and economic sustainability because they allow us to take both animal and pre-consumer food waste and turn it into an array of value-added products. In addition to defraying our energy costs and allowing us to earn tipping fees for accepting food waste, the digester also outputs Grade A compost, bedding for cows, and renewable fertilizer that we use on our cropland to grow feed.

There are currently 254 digesters operating on livestock farms in the U.S., of which 204 are on dairy farms. When we installed our digester, there were significantly fewer in operation and far less shared knowledge about biogas generation among farmers, cooperatives, USDA, EPA, digester engineers, and energy compa-

nies to help get a digester project from concept to installation and profitability. In the interim, the dairy industry worked with USDA, DOE, and EPA to develop a Biogas Opportunities Roadmap, which has helped many more dairy farmers and the U.S. dairy industry work toward meeting the voluntary goal of reducing greenhouse gas (GHG) emissions from fluid milk by 25 percent by 2020. Biogas production is also critical to the Net Zero Initiative, a new industry-wide initiative to help the U.S. dairy sector reach the goal of carbon neutrality by 2050 while also optimizing our water use and improving water quality. Biogas is part of a larger systems approach to sustaining dairy farms, and it must be incentivized along with improving soil health, 4R practices for feed production, animal care, precision feed management, and manure management.

Before going any further, I'd like to thank this Committee for the work you've done to incentivize biogas production on farms while urging you to continue helping dairy producers of all sizes to generate biogas and improve their environmental and economic sustainability. The Biogas Opportunities Roadmap estimates that over 8,000 potential livestock farms, of which 2,704 are dairy operations, could host a biogas system, producing 13.1 billion kWh per year, or enough to power 1,089,000 homes for a year. To meet this potential capacity, however, we must overcome a variety of financial and regulatory roadblocks. I will quickly outline the difficulties I encountered in installing my digesters as well as the challenges that persist for my fellow dairy farmers who want to install their own.

The primary impediment to on-farm digester adoption is the lack of financial incentives available to farmers. I strongly believe that once the proper incentives are in place, digesters will be adopted throughout the industry. It is the proper role of government to help facilitate early adoption to the point that economies of scale develop, technologies advance, and capital costs drop. Our industry has been significantly impacted by the uncertain farm economy (even before COVID-19), and digesters, which inherently entail long-term planning and significant capital costs, are simply out of reach for most farmers. Dairy farmers strive to be part of the solution to the climate and water quality challenges facing U.S. agriculture, but our voluntary efforts can only go so far without the continued support of Congress, USDA, DOE, and EPA.

For some reason, repurposing cow manure does not have the same shine as an array of solar panels or the grandeur of a wind farm on the horizon. USDA's own data show that from 2002–2019, the Department made 631 investments in anaerobic digestion worth \$198 million, compared to 6,179 in solar worth \$2.93 billion and 696 in wind worth \$468 million.¹ USDA has provided more than ten times as much in grants, loans, loan guarantees, and payments for solar production than it has for anaerobic digestion.

To illustrate this disparity more concretely, consider the USDA Rural Development's (RD) Rural Energy for America Program (REAP), which provides important loan guarantees and grants for energy development. REAP has provided nearly \$100 million to solar development, compared to only \$36 million for anaerobic digestion. REAP prioritizes solar development over biogas by not properly accounting for anaerobic digestion's secondary benefits. Whereas anaerobic digestion provides several other environmental benefits—such as avoided methane emissions, mitigated odor and air pollution, and minimized nutrient loading—solar panels provide nothing other than clean energy. While wind and solar are important to the rural economy and America's energy transition, they do not offer a systems approach to agriculture's challenges the same way that anaerobic digestion does. And while the dairy sector is fully supportive of solar and wind development, biogas provides several additional income streams while addressing multiple resource concerns. It should be valued as such by USDA and other Federal agencies with a renewed focus on promoting the technology.

USDA has made significant progress in implementing REAP to the benefit of anaerobic digestion by allowing stacking with the Environmental Quality Incentives Program (EQIP). In addition to the work on the Biogas Opportunities Roadmap, USDA's Natural Resource Conservation Service (NRCS) and RD came to an agreement allowing certain project costs to be covered by one program, with other costs covered by the other. However, in two of the top five dairy producing states, NRCS does not even offer the Anaerobic Digester (366) practice to producers through EQIP. This is just one example wherein producers would benefit from increased coordination among different agencies at different levels.

To achieve the goals of the Net Zero Initiative, dairy farmers will not be able to rely on Federal funds alone. However, access to private capital to fund digesters has been limited. Federal funding, in the form of cost-sharing, research investments,

¹<https://www.usda.gov/energy/maps/report.htm>.

and loan guarantees will remain critical to the expansion of the nation's biogas capacity, but Congress can also help by creating an environment that facilitates private capital investments into biogas. For instance, the bipartisan Agriculture Environmental Stewardship Act (H.R. 3744), which was introduced last year in both chambers of Congress, would create a 30 percent investment tax credit (ITC) for biogas used as renewable gas in vehicles or as renewable heat as well as for manure resource recovery technologies. The Section 48 production credit for biogas for electricity expired at the end of 2019, and there have never been production credits for biogas for fertilizer. This investment tax credit is just one way to incentivize the expansion of on-farm biogas capacity, and just one piece of the puzzle to helping U.S. dairy reach net zero.

Another way to encourage investment is to create certainty that a market for biogas will exist into the future. The first, and easiest, way to increase certainty around biogas returns is to encourage EPA to process the backlog of applications for the Electric Pathway under the Renewable [Fuel] Standard (RFS). Under the RFS, electricity produced with biogas is considered a renewable fuel when used for transportation purposes. Therefore, electricity used to power electric vehicles is eligible to generate and sell Renewable Identification Numbers (RINs) under the RFS. That is the essence of the RFS "electric pathway" and what have commonly been referred to as "e-RINs." EPA finalized a rule for this pathway in 2014 but has processed no registrations to date. The electric pathway would allow agricultural digesters that are not near a natural gas pipeline to participate in the RFS by generating renewable electricity and putting those electrons onto the grid.

A simple illustration shows the potential value that activating the electric pathway could generate for a farmer who is considering an investment in an anaerobic digester to generate renewable energy. Assume a standard vehicle with an internal combustion engine is driven 25 miles per day and achieves 25 miles per gallon fuel efficiency. One gallon of gasoline consumed has the energy content of ~115,000 BTUs. A RIN has a defined value of 77,000 BTUs, so substituting an electric vehicle would displace that 1 gallon of gasoline and thus would qualify for ~1.5 RINs. The electric vehicle, driven the same 25 miles per day, would consume 8.5 kWh of electricity (equating to 0.34 kWh/mile). Using the current D3 (Cellulosic) RIN market pricing of \$1.58/RIN, the incremental revenue associated with the RIN would equate to \$0.28/kWh (1.5 RINs * \$1.58 = \$2.37 / 8.5 kWh = \$0.28). This incremental revenue would need to cover the administrative costs associated with reporting and verification of the e-RINs, with the remaining value being split between the producer of the renewable energy (the farmer), the utility, and the electric vehicle supplier/consumer, depending on the project structure. A conservative estimate of 30 percent for administrative costs would result in ~\$0.20/kWh net incremental benefit, which would be a sufficient incentive to attract additional investment in anaerobic digesters to produce renewable electricity.

A practical illustration of how an electric pathway could be administered is fairly straightforward. A clearinghouse entity could be established to receive electricity production data from a utility on the daily production of kWh of renewable energy from designated projects. Note this would be similar to the existing process used for reporting Renewable Energy Credits (RECs). The clearinghouse would also receive telemetric data from electric vehicle manufacturers detailing daily miles driven and kWh's consumed by each registered vehicle, identified by vehicle identification number. The clearinghouse would then use the two sets of data to calculate the equivalent quantity of RINs generated and submit the required information to EPA. Once the approved RINs are provided by EPA, the clearinghouse would sell the RINs to an obligated party and distribute the revenue according to the agreed-upon methodology. The clearinghouse would be responsible for ensuring that all reporting and verification requirements of EPA are satisfied.

Many digesters selling to the grid receive below-market rates for their electricity, and these payments alone cannot sustain the operation of a digester. To illustrate the potential impact of activating the electric pathway, assume 8,000,000 dairy cows could generate about 15 billion kWh's annually of renewable electricity. Assuming that all of this incremental electricity qualified under the electric pathway, the theoretical revenues from e-RINs would provide about \$4 billion in annual incentives. It's important to note that the 15 billion kWh's would equate to less than 0.5 percent of the total U.S. electricity market and power only about 25 percent of the projected 18,700,000 electric vehicles² on the U.S. roads in 2030. Activating this electric pathway would serve as a market signal to producers, incentivizing them to ex-

² https://www.eei.org/resourcesandmedia/newsroom/Pages/Press_Releases/EEI_Celebrates_1_Million_Electric_Vehicles_on_U-S_Roads.aspx.

pand biogas capacity. We appreciate the support that many in Congress, including on this Committee, have provided to efforts to resolve this issue.

Digesters are expensive, and such a large investment means we are in it for the long haul. As I, and others, look to pass our farms along to the next generation, we need more certainty that the digesters we decide to install today will remain viable for years to come. As an industry, we have made the long-term commitment to continuously improve until we reach net zero, and we hope that you will join us on that path.

Biogas production is representative of the comprehensive systems approach we are taking on our farms to work toward a goal of net-zero emissions. A well-designed biogas system closes disconnected carbon and nutrient cycles on a dairy farm, all while offering producers an additional revenue stream. Manure is turned into electricity, bedding, fertilizer, and compost while methane and carbon emissions as well as nitrogen and phosphorus loading are reduced. The Net Zero Initiative is about each dairy farm—regardless of size, region, or production style—contributing what it can, where it can. No individual farm will be held to the Net Zero target, yet all will play a part. I, and my fellow dairy farmers, look forward to working with Congress, USDA, DOE, and EPA to further the environmental and economic sustainability of U.S. dairy.

In closing, thank you for the opportunity to testify here today. I am happy to answer any questions Members of the Committee may have.

The CHAIRMAN. And thank you, and now my turn.

I tell you, this has really been so exciting to hear each of your presentations, and I am very excited about this project, as you can see, because I long have been advocating that it is the agricultural industry that can lead the way in terms of dealing with renewable fuels and our energy so and each of your testimonies have certainly explained that.

Now, Mr. Harris, let me start with you because you gave some very profound statistics, some very meaningful information. You first of all said that, which is important, that every week, you inject into Georgia's economy over \$100,000 in salaries with your employees, and then you made another statement that really shocked me in a way. You said that you were able to produce over ½ million barrels of crude oil out of the air, if I am not mistaken. I think that is what you said.

Both of those statements really hit it on the nail of how dynamic this whole issue is, and it rests in the hands of those of us in the agricultural industry.

So, could you give us the top three or four things that we here in Congress can do to help you and the others who are literally pioneering in this effort? What is it that we in Congress need to do most that will help you?

Mr. HARRIS. To be clear, the comment about the oil, we didn't produce oil. We sequestered that equivalent. We sequester about a barrel of oil a year per acre in carbon dioxide equivalent, and that is where that came from, just to be clear on that.

The CHAIRMAN. But the issue, to me, is not the amount, but you were able to get it out of the air.

Mr. HARRIS. Yes.

The CHAIRMAN. Can you maybe explain that a bit?

Mr. HARRIS. Yes, sir. Regenerative agriculture is about regenerating the cycles of nature. Cycles of nature are, to name a few, the carbon cycle, which is what we are talking about here, the mineral cycle, the energy cycle, the water cycle, the microbial cycle, all the cycles that produce an abundance in nature. That is how the oil got in the ground in the first place is all those cycles working

well since the time of the dinosaurs, sequestering carbon, putting energy into the soil.

Industrial farming practices breaks those cycles of nature. The use of cultivation, chemical fertilizers, pesticides all break those cycles that I mentioned and are disruptive. The abundance is not there in the amount that it had been prior to all those technologies.

The CHAIRMAN. And now, if you could share with us—and I thank you for that explanation there. It is just profound.

But, could you share with us in my time that I have left, what is it that you can tell us that we in Congress need to do to help you?

Mr. HARRIS. First and foremost, I would say that a more careful look at how foods are labeled would be very helpful. I believe that there are intentional rules that mislead consumers in terms of product labeling. I think consumers really struggle to know what they are buying at the store.

Second, to do what we have done here is highly replicable. It is not highly scalable. It won't operate in 20 states. It is highly replicable. There can be many of us. The limitation is financing. I was blessed in inheriting a nice farm, but I leveraged through common bank financing, small town bank financing. We borrowed \$7.2 million, invested it in this processing facility. I think that is important because what has been done here was done by a proud "C" University of Georgia College of Agriculture student with bank financing, not a Rhodes Scholar with a trust fund. It is highly replicable, but access to financing, more truth in—through USDA—Mike can remember some more things. I did not anticipate that question.

The CHAIRMAN. Thank you very much.

And now I would like to recognize the Ranking Member, Austin Scott.

Mr. AUSTIN SCOTT of Georgia. Thank you, Mr. Chairman, and I want to point one thing out that Mr. Harris said in his testimony. I am from the great State of Georgia, and we do have 159 counties, and every county had at least one family-owned—we don't like to call them this, but they are actually slaughterhouses. And when we talk about the environment, I think it is important to point out that today in Georgia—and Mr. Harris can correct me on this if he feels I am wrong. But, if you grow a hog in south Georgia, that hog is put on a truck. And many of those trucks haul those hogs all the way to Tar Heel, North Carolina before they are actually processed. And certainly, there is a tremendous amount of diesel that is burned by those semis that are hauling those trucks. And I think that as those small businesses shut down around the country, not only has it led to a damaging consolidation of the supply chain in our food supply, but it does force a tremendous amount of additional transportation costs because of that.

One of the things that I do think that we could do that would be in the benefit of the country would be to help small food processors around the country so that we don't have to haul the products so far.

The other thing I want to do is mention that, as I said, we can and should do a better job of taking care of the environment. I think that all of these gentlemen have done some extremely cre-

ative things, and I am proud of that. I do want to mention my concerns, again, with solar subsidies, and I do believe that when we see highly productive ag land, irrigated cropland coming out of production and going into solar fields, that that is an indication that perhaps the solar subsidies are too generous, and I do think that those solar fields have certainly a negative impact on the habitat that is so important for our wildlife and other things.

I would like to ask to submit this to the record. This is from *Bloomberg*, and it is an article that says “Bill Gates says wind and solar subsidies should go to something new, encouraging us to move to newer, more productive technology.”

[The article referred to is located on p. 63.]

Mr. AUSTIN SCOTT of Georgia. With that said, gentlemen, I appreciate you being here and look forward to taking your solutions for the environment and expanding on them.

I would note that all of the things that you have done and your efforts are voluntary, and I appreciate that, and I certainly support these practices remaining voluntary. But for each of the witnesses, would you just briefly tell us what was the reason you decided to take on the renewable energy projects on your farm, and what environmental concerns do you feel your particular project is helping to address?

Mr. SIEVERS. Ranking Member Scott, this is Brian Sievers. I would be happy to go first, if that is okay.

Mr. AUSTIN SCOTT of Georgia. Yes, sir.

Mr. SIEVERS. The driver behind the incentives that we looked for in creating our renewable energy projects really focused around a belief that our resources are natural, God-given resources. The air, land, water, sun, and people are something that we need to find the highest and best use for in everything that we endeavor and strive to do, and that is why looking at renewable energy projects achieves that objective, and really, it helped fulfill maybe something that was more in our heart, as well as in our head.

When you look at how can we protect our water, our soil, our air, we think renewable energy production on-farm is helping us to accomplish that. And if you look at some of the history of what we have done on our farms and the various conservation practices, why it is it just another way in which we can advance that set of objectives or goals for our farming operation.

In terms of the environmental solutions that we found, really helping, and I joke sometimes with the falling energy prices that we have seen. The price of electricity that we now get for the electricity we sell to the grid is about 25 percent less today than it was when we signed our power purchase agreement back in 2012 with our power local service provider. We are suffering financially because of low commodity prices, if you will, for the energy we sell through electricity, but we still receive tremendous value from those natural soil amendments and soil products that we produce every day, 50,000 to 60,000 gallons a day of natural fertilizers that we are able to use on our farms in our fields. And that is really the environmental solution that we found is that we don't have to purchase inorganic forms of fertilizer that is imported. In many cases, we can produce those right on our own farm.

Dr. McCloskey was right, making sure we focus on ways to help incentivize the trends that we produce through these digesters and our biogas systems, but also if there is any way in which can be helped through this Committee, encourage the EPA to look at the e-RINs pathway, that would also be extremely helpful, too. And again, it would help address environmental challenges and climate challenges for all of these.

Mr. AUSTIN SCOTT of Georgia. Thank you, and I appreciate your answer. My time has expired, unfortunately. Maybe we will have time for a second round.

Again, Mr. Chairman, I want to tell you, I think we can and we should do a better job of taking care of the environment. I do think that we have to keep in mind the habitat for the wildlife and the animals. And let me commit, again, to working with you. One of my primary concerns is that when something has proved not to work, is that we don't ever seem to be able to get rid of that. And while I would tell you, diesel particulate filters on our equipment have done a good job of reducing emissions, diesel exhaust fluid is something that has not, and that is just an example of something that we continue to effectively mandate with diesel exhaust fluid that there is little to no benefit from.

The CHAIRMAN. Yes, and you have been doing outstanding work on this, Austin, and providing great leadership, so I look forward to working with you on this. This is a very exciting and dynamic area, and our farmers are doing such fantastic things, as we are witnessing here today.

Now, I would like to recognize our Ranking Member of the full Committee, and our former Chairman of the full Agriculture Committee, my friend, Mike Conaway.

Mr. CONAWAY. Thank you, Mr. Chairman. I appreciate that.

Dr. McCloskey, thank you for being here today. As you know, I am an avid consumer of your chocolate milk, and when the COVID-19 happened and the supply chains across everything was disrupted, there is obviously no interest like self-interest. I was concerned that the chocolate milk would not be available, but your system worked wonders and I have not missed a day. And I also need to thank you for your running commentary with my good friend, Phil Fouché. I am forever indebted for that and for you doing it.

When the COVID-19 issues happened and everything shut down, let's back up a second. Obviously, all of these operations are dependent on a normal business stream and normal operations, normal cash flows that you have in place in order to make it work. Can you visit with us a little bit about what happened to you and your system when the disruptions in the supply chain happened in March, April, and May, and how that affected your ability to maintain the sustainable and environmental stewardship programs that you had on your operations? Were those affected by that disruption?

Dr. MCCLOSKEY. Thank you, Congressman.

Yes, it was devastating like it was for everyone in the country. The problem of dumping, we had to dump milk on the farms. We couldn't collect all the milk at all the farms, and obviously the collapse on the whole pricing system because of the shift from food service. The shutdown of food service increased in retail, but not

enough to offset the food service. There was a lot of disruptions from the marketplace resulting in unbelievably low prices. I mean, we saw numbers that were 50 percent below previous incomes. And we all know that all of us farmers work on very thin margins, so when they take 50 percent out of your gross pay, it is devastating. And it was devastating for small producers, medium size producers, large producers on an equal basis, because it is all relative to the hundredweight of milk. There is some value in scale, as we all know, but in a situation as devastating as we all went through, that damage is felt all the way through. I don't care how big you are. I don't care what your efficiencies are. I believe that in those cases, all producers should be treated equal. We do accept within many of our programs in USDA that there should be help for smaller farms *versus* larger farms. There are some differences in how these programs work. There are some limitations these programs put on some larger farms. But I do not believe that in cases of disasters and devastations like we live, that that distinction should be made because I believe that all farmers suffered equally through this, and that all farmers should be helped in some way that is on an equal basis, equal footing.

As far as our environmental efforts, Congressman, we continue them all, obviously at a tremendous expense. But, we always hope for a sunny day to come, and we kept on investing in everything we invest, and we are back up and running, but obviously with a big hole in our economic performance. And hopefully, we can make that up in the years to come.

Thank you for asking.

Mr. CONAWAY. Thank you. I appreciate that. I know you also run an agritourism program, and Fair Oaks as well had to be affected.

Let me just make a comment about the e-RINs Program, and both of you have talked about how that would help.

My concern is that simple shifts cost from one group to the other in a particularly convoluted way. I am not sure where that echo is coming from.

The CHAIRMAN. Can we have one of our technicians sort that out.

Mr. CONAWAY. Anyway, it sort of shifts the costs around in a very convoluted way.

You mentioned having a lot of electric vehicles on the roads. We currently don't have a way for those electric vehicles to share their impact on our road system, and so finding a way to pass these extra electricity costs on to the folks who want to drive cars and those kinds of things might be a better solution than hiding it with the way the e-RINs Program works, and I am really concerned about how that would flow through. Because at some point in time, it has to get to a customer, and if we keep it opaque, it makes it difficult to figure that out. And so, having a more straightforward way to do that, as well as, as you all promote electric trucks and cars, you are going to have to be part of the conversation that says how do those vehicles share the costs of our roads and bridges the way that fossil fueled cars and trucks have currently been supporting that program.

I appreciate all four of you being here today and your efforts to try to keep the environment clean. We all want to breathe clean air and drink clean water, and I share the Chairman and the

Ranking Member's concerns in that regard, and thank you for your roles in trying to push forward good policy.

With that, Mr. Chairman, I yield back.

The CHAIRMAN. Thank you very much, Ranking Member.

And now, I will recognize Mrs. Axne from Iowa.

Mrs. AXNE. Thank you, Chairman Scott, and thank you all for being here today and lending your expertise to the Committee.

Bryan, it is always great to see an Iowan before us at the Committee, so thank you so much for joining us.

I appreciate all the different success stories on the benefits of the farm energy programs, in particular, how it can result in positive climate outcomes while creating more economic opportunities for farmers. I have said this all along. We can be sustainable and we can grow economic viability at the same time. It is something I firmly believe we need to invest in and improve access to. We know how successful REAP or the Rural Energy for America Program has been, but also how oversubscribed it is with strong demand.

Mr. Harris, I am pleased to hear that your business received a REAP solar grant that helped make your operation sustainable, so I have a couple of quick questions for you. Number one, how did you find the REAP process worked for you, and how was your solar array worked out? And then second, do you think the program should be expanded so that more folks like you around the country can deploy rural renewables like solar, wind, and biogas systems?

Mr. HARRIS. Thank you for the question.

The REAP grant worked very well for us. We received a lot of support from our USDA representative that hounded for us. He smoothed and fed us and it worked well. When I built that facility, it provided about 40 percent of the power for our slaughter plants. We have expanded them and so it is down to about 20 percent, and we are now applying for another grant through the Department of Energy which will allow us to build a prototype to use cattle under the array. We regenerate the soil, increase the carbon amount in the soil to sequester more carbon dioxide equivalent, as I mentioned earlier. It is a very important experiment.

I would invite Mr. Scott to come and let me show you at White Oak Pastures here in Georgia that I disagree, we are not taking land out of agricultural production and putting it in solar energy production. We are using the same land for food production and energy production at the same time, and in doing so, we are putting more water into the soil, increasing the organic matter of the soil and carbon sequestered from the air. This experiment that we are working with to apply for the grant to build a new array on this farm to prove that it can further work to get maximum benefit from the cycles of nature.

Mrs. AXNE. Well, thank you so much for that.

And Jim, I noticed that you were turned down for REAP, so I am curious to hear what your thoughts are of REAP, how you would use it, what you think it could do if it were to be funded to meet the demand? Can you hear me okay, Jim?

The CHAIRMAN. He may have to unmute. Who was the question directed to? Mr. Falk?

Mr. FALK. There we go.

The CHAIRMAN. Oh, good.

Mr. FALK. Sorry. I apologize. We are breaking up occasionally here with everything. The question was regarding us not receiving a REAP grant?

Mrs. AXNE. Right. I am curious to hear what your thoughts are if we did fund to the level of demand that we have. What do you think we would be looking like?

Mr. FALK. I don't know what that level would be, but it would be significantly more than what it is because the amount of proposals that come in for this funding far exceed what is available.

It is a good program, it is a good tool. Not every project needs to be funded, but there are projects that probably shouldn't be funded. I would say the majority of the projects that come in requesting a REAP grant have value, and unfortunately when you don't—we are not able to fund your project. We don't have enough funds to continue to fund projects at that level.

Mrs. AXNE. Thank you so much. I have so many other questions, but my time is up. I yield back.

The CHAIRMAN. Thank you very much, Mrs. Axne.

And now, we will recognize Congressman Johnson from the great State of South Dakota.

Mr. JOHNSON. Thank you, Mr. Chairman, for the shoutout for the great state.

I will ask two questions for each of the panelists, and for efficiency sake I will ask them both, and then you can each go through and give your answers. We will go Falk, Sievers, Harris, and McCloskey, so you kind of know where you are in the batting order.

My question is, first, what kind of community response did you get to the investments you were making in these projects? Did people seem to understand them? Was there opposition? Were people generally supportive? And then the second question is what are you hearing with your colleagues in the ag industry? Does it seem as though there is more interest in people making investments like this? Obviously, policy plays a big role, but if they got the right kind of economic and policy environment, how much more projects like yours do you think we would see from your colleagues?

With those two questions in mind, let's go ahead and look to Mr. Falk first.

Mr. FALK. [inaudible] interest in doing renewable energy on-site, but of course as the traffic of seed producers and growers and a number of folks that—and everyone has questions about is it viable? And so, there is a tremendous interest, and I have had nothing but positive feedback about it.

I would make sure we have good access so that if we want a project [inaudible] operation and a partnership with the providing energy, so they have a role to play as a partner as well.

Mr. JOHNSON. I think you are done, Mr. Falk. I heard a little break-up there, but thank you for your answers.

How about Mr. Sievers?

Mr. SIEVERS. Thank you, Congressman. In Iowa, we participate in a protocol when it comes to siting livestock facilities like what we constructed, along with our renewable energy facility that allowed public input through what is called the Master Matrix Scoring process where the Department of Natural Resources oversees the siting of a facility like ours, and it allows for local or public

input through the county level. And so, we went through a discussion with all of our neighbors. We voluntarily went to our neighbors, talked about what we were wanting to do, got very good feedback, positive feedback by and large, and we got a chance to meet with our county board of supervisors, lay out our proposal, and subsequently they recommended that we be able to move forward to the Iowa Department of Natural Resources with our project. So, by and large, the community response we received has been positive.

With regard to the second question you raised and how our colleagues in our industry are responding to the opportunities to look at additional anaerobic digestion and biogas facilities, we do see several projects starting to move forward in Iowa. The opportunities are tremendous. In Iowa, we currently have three on-farm anaerobic digesters. They all utilize beef cattle manure as well as some offsite co-feeds in their digesters. And our land mass in the State of Iowa is pretty comparable to Germany, and in Germany, there are 9,000 digesters. The opportunities are tremendous for us to be able to grow and develop and utilize many of these organic waste streams in our anaerobic digester facilities. I don't expect to ever see that many facilities, but certainly more than three, is what we are going to hopefully look forward to here in the State of Iowa, and I do think we are going to continue to see more, especially with regard to livestock operations, especially dairy farms. We would like also to see equitably treated manure sources when it comes to scoring these facilities in programs like California's Low Carbon Fuel Standard. We think beef cattle manure, swine manure, dairy manure, all should be treated equitably when it comes to the scoring in those regulatory approaches, and that would help provide some incentives as well for beef cattle producers to also expand and develop more digester projects.

Mr. JOHNSON. Thanks very much, and we will just need to go to Mr. Harris. You have about 30 seconds, and sorry, Dr. McCloskey, we ran short on time.

Mr. Harris?

Mr. HARRIS. Today, we built a store. We renovated the courthouse and the Methodist church, the offices, built a restaurant. We have lodging, we have tourism. Bluffton, Georgia did not have a single new housing starting from 1972 until 2015. Since then, we built or renovated a dozen houses in Bluffton. So, it is well-received.

The question about colleagues embracing a different sort of farming, I will tell you that industrial commodities, centralized agriculture, it has not been good for our land or our rural communities or most of our farmers. And I believe that movement will be consumer-driven. But if consumers know the truth about their food, they will offer a market and entrepreneurial farmers will step up.

Thank you for your question.

Mr. JOHNSON. Thank you very much. Thank you, Mr. Chairman, for your indulgence, and I yield back.

The CHAIRMAN. Thank you very much, Mr. Johnson, and now I would like to recognize my friend, Ms. Spanberger of Virginia.

Ms. SPANBERGER. Thank you very much, Mr. Chairman, for hosting this Committee hearing. I appreciate that we are having

this hearing today. If we are going to effectively combat the climate crisis, farmers and producers have to be part of that solution.

Dr. McCloskey, if you will indulge me, my colleague, Mr. Johnson from South Dakota was on a train of questioning which I found to be very interesting. I know he ran out of time, but I would like to begin with using my time to give you the opportunity to answer his question, which was about how did your community respond, and then how did your colleagues and counterparts respond to—well, I will defer to you, Dr. McCloskey.

Dr. MCCLOSKEY. Thank you, Congresswoman. I appreciate that.

Yes, so the response was overwhelmingly positive. The nice thing about digesters and our farms is we do produce renewable energy, but besides that, it produces so many other things beyond solar or wind or other sources would produce in renewable energy.

We get the renewable energy, but we also are in the beginning of a process of nutrient recovery of clean water, so that is really important to state because through that nutrient recovery, we are helping our Clean Water Act and avoiding the serious issue of eutrophication in our waterways and our base. And on top of that, on a local basis, it mitigates about 80 to 90 percent of the odor on a farm, and so it is a great help in your fly control for neighbors as well. So, it is very, very well-accepted. You get so much in one package *versus* some other alternatives that I just—there has been a lot of investment in solar, a lot of support for wind. I don't feel digesters have received that same level of support that produces energy 24/7. It is a constant source. If the sun is not shining or the wind isn't blowing, we are still producing energy and we are doing so many other great things at the farm level by producing these great fertilizers that now can be handled in a much better way by creating clean water, by eliminating odor, and other smaller issues like fly control, which is a not small issue to a close by neighbor, believe me. So, it has been very, very well-accepted.

And as far as other colleagues wanting to do the same, I have a visiting center at Fair Oaks. We have over 200,000 visitors a year that tour the farms and see the digester. A lot of them are dairy farmers, and I get to interact with them. They would embrace this immediately if the financial situation was such. Again, we have the advantage of scale. Scale has been very beneficial for us. We have invested because of scale. It is a duty that we have, we believe, and we have to give back. And therefore, we believe that regenerative farming, sustainable farming, these digesters and these investments in how we are farming is incredibly important. But not everyone can afford them. If people look at this, they really wish they could do it. My point today is we need to help with the capital investment, ITC is something that is investment of the government. It actually grows the Treasury because this industry is ripe to explode. Thousands and thousands and thousands of jobs will be created. Industries will grow, and there will be an incredible amount of manufacturing.

I will tell you that in the dairy alone, based on the proposal that I shared a little while ago, I would see no less than 5,000 digesters created nationwide, and I wouldn't be afraid to say that thousands more than that. But I will conservatively tell you that if we had an ITC credit, if we could use stacking properly from USDA, and

if we had a secure market through e-RINs, that this thing would explode for us, and we would see digesters dotted all over our country. It would help tremendously local farmers, local communities. These digesters can take—besides another advantage of digesters that I didn't mention is that we can take in substrates, so other materials, organic materials, be it food waste or others, that we can bring into the digesters and actually double the amount of energy. I have done that on my digesters. You can double the amount of energy that we are producing by bringing in this food waste, and so you can become a community disposal for other waste within your area.

Ms. SPANBERGER. Dr. McCloskey, I am very, very glad that I spent my time following up on Mr. Johnson's question.

I was planning to ask about REAP and a variety of other things, but I have found this to be fascinating. You have provided us, all four of you, with your answers to his questions, good feedback, and I am grateful.

Thank you to the Chairman for indulging me in going over, and again, to the witnesses, thank you for being here. Thank you for all that you do on your farms, and thank you for helping to educate Members of Congress and the public in your work.

Thank you.

The CHAIRMAN. And thank you.

And now, Mr. Baird, the gentleman from Indiana.

Mr. BAIRD. Dr. McCloskey is from Indiana, and my district.

Anyway, my question deals, Dr. McCloskey, you did not mention the facilities that you have also have an educational aspect. It is interesting to watch those children come to your place from urban and suburban areas and see a calf born for the first time. The educational benefits of your facility are also important.

But, my question deals with this: Mike, do you feel that multiple farms could participate in a single digester? And I am going to tie—

The CHAIRMAN. Excuse me. Someone needs to mute, please. Thank you.

Mr. BAIRD. Anyway, the question I have is, Mike, whether or not several farms could participate in a single digester?

Dr. MCCLOSKEY. Yes, thank you, Congressman.

Absolutely. Actually, we have three separate farms that all of the manure ends up on one single very large digester. We have many models. If I work with the industry through several of our trade organizations and businesses that we put together, we have several models where we go into areas that have smaller dairies, and we can then bring in manure from several dairies that have proximity. You need to stay with some level of proximity. I would say, within 10 miles you could create clusters of digesters that could work very well. Once you get a little further out than that, you have to be innovative of how you can do that. It still can be done, but you can be innovative. There is great opportunity in that as well is to be able to aggregate several farms if they are close enough to do a digester.

Mr. BAIRD. Do you feel there are any barriers or regulations to being able to do that?

Dr. MCCLOSKEY. No, I don't necessarily. There would be more a local type of regulation of moving manure in the proper vehicles and moving that manure down the road, but that would be more of a local. I have not encountered ourselves any regulations in Indiana. Matter of fact, they are very supportive of our efforts with all of our manure management in Indiana. Nothing that comes to my mind, Congressman.

Mr. BAIRD. Thank you very much, and we really appreciate you being here.

Mr. Sievers, do you have any thoughts?

The CHAIRMAN. Mr. Sievers, you may want to unmute.

Mr. SIEVERS. Yes, thank you. I am sorry about that.

The barriers that you bring up, that is a very good point. Because of the financial challenges of selling electricity into a market that is very, very competitive against solar and wind, we have investigated and evaluated production of renewable natural gas from our digesters.

One of the barriers that we have encountered is we would like to even possibly transport biogas that is partially cleaned and compressed not to the level that renewable natural gas is typically compressed to a hub, if you will, that can take that gas, finish the clean up and compression so that it can be injected into a pipeline. And that is what we are looking at here in Iowa is what is called a hub and spoke approach, where you have an interconnect into a pipeline at, say, a large landfill facility, for example, and then several livestock operations in that region or neighborhood could pipe or transport their biogas, partially cleaned, to a facility for final clean up. As I understand, there may be some regulatory hurdles with transportation of that type of, I don't want to call it raw biogas, because it is partially cleaned and compressed, but it is not fully cleaned and compressed renewable natural gas either. So, that would be one area we probably would want to look into to make sure that there are no regulatory hurdles with that if the technology is available for us to be able to do that. And that is one the things we are evaluating.

Mr. BAIRD. Thank you very much, and I appreciate all the witnesses being here today.

My time is up, and I yield back, Mr. Chairman.

The CHAIRMAN. Thank you very much, Congressman Baird.

Now we will hear from the distinguished Congresswoman from Minnesota, my friend Ms. Craig.

Ms. CRAIG. Thank you so much, Mr. Chairman. It is a real honor to be on your Subcommittee. It is also a pleasure to have Mr. Falk here today representing Minnesota's Farmers Union, an organization that I am proud to be a member of. I am a strong supporter of the Rural Energy for America Program, and I was proud to lead our efforts in the House to call for increased appropriations, and I am pleased the proposed full year 2021 ag appropriations bill provides a loan level of \$20 million for the Rural Energy for America Program, an increased level, and an appropriation of \$476,000 for the loan subsidy.

However, as Mr. Falk mentioned in his testimony, his farm's REAP grants were unsuccessful because the nationwide demand far outweighs the funding availability. I will continue to be a cham-

pion to increase this funding. Minnesota has long been a leader in the REAP Program, so Mr. Chairman, I appreciate that we are taking time to work on the energy title today. These farm bill energy title programs are prime examples of farmers being part of the solution to our changing climate.

Mr. Falk, as we begin to move into recovering from COVID-19, producers are looking for ways to increase on-farm income. How have you seen renewable energy increase your bottom line, and do you see it as a worthwhile investment for producers? What are the most effective incentives Congress can continue to provide? Mr. Falk?

Mr. FALK. You are going to have to repeat part of that. We were breaking up. I apologize.

Ms. CRAIG. No, no, that is fine. Mr. Falk, if we move toward recovering from COVID-19, we are looking for ways to increase on-farm income. How have you seen renewable energy increase your bottom line, and do you see it as a worthwhile investment for producers? What are the most effective incentives that Congress can continue to provide?

Mr. Falk, are you with us?

The CHAIRMAN. Mr. Falk, you may have to unmute.

Mr. FALK. I locked up, but I think I am understanding your question is what would be the benefits, or what do we need to do to enhance these programs? And the tax incentives are still an extremely important component. We have had an on and off system through the years, and industry needs to be able to be reliant that there are [inaudible] government if they are going to be investing in an industry. And then the REAP grants, obviously, were underfunded and I appreciate [inaudible].

Ms. CRAIG. Well, as we all lock up today, I also want to mention that I do support \$100 billion investment in high-speed internet across our nation.

Mr. Falk, if you can hear me, I am also interested in how you think we can support biofuels and biobased manufacturer sector in order to create a value-added market for commodities and increase domestic manufacturing?

Mr. FALK. Well, all these tools are important to combat climate change for our rural economy, and the price of corn was \$2.75 locally here last night when I looked, and [inaudible] impact to our farmers on—with these low commodity prices. And any time we can add value, and it is [inaudible].

Ms. CRAIG. Mr. Falk, thank you so much. I really appreciate you being here and very proud of the State of Minnesota and the work that we are doing.

With that, Mr. Chairman, I yield back.

The CHAIRMAN. Thank you very much.

And now I would like to recognize our Ranking Member, for any closing remarks that you may have.

Mr. AUSTIN SCOTT of Georgia. Thank you, Mr. Chairman. I just—did I hear Mr. Falk say correctly, I have not heard this, that the price of corn locally for him was \$2.75? Is that the number he quoted? Wow.

Mr. Chairman, one is I think that this is an extremely important issue, not just for agriculture, but for the country. I want to com-

mend the families that have been represented here today for their work and what they have done and their environmental stewardship. I, again, want to commit to you to work with you. I believe that we can and we should do a better job of taking care of the environment.

And before I turn it back over to you, I do want to mention this. What Mr. Falk said with the price of corn and where commodity prices are right now, if commodity prices across this country stay where they are, regardless of what we do with the ability to reduce energy prices on the farm, there is not a farmer in this country that can survive with corn around \$3 a bushel. It is not possible for our ag communities to survive with the commodity prices where they are in this country. I am very concerned with, as we have another COVID-19 package come forward, assuming that we are able to get to an agreement on a COVID-19 package, I do believe—and while I don't believe this is a long-term solution for our farmers, in fact, I will tell you I know it is not a long-term solution for our farmers. But I do think that any additional COVID package needs to have a fully-funded round of Market Facilitation Payments, in addition to the other funds that are being discussed for our rural communities. Of the \$4 trillion that the United States through Congress and through the Fed have currently spent, less than ½ of 1 percent of that has gone to our agricultural producers in this country. And let me just say, any additional COVID-19 relief has to show the respect to the agricultural producers in this country that they deserve, and the value that they bring to our national security through our food security.

And with that, Mr. Chairman, I will turn it over to you, but I want to thank the witnesses for being here.

The CHAIRMAN. Well, I want to thank you for your comments, and I want you to know I absolutely agree with you. We have to do much more to elevate our farmers up at the top of the spear, the lead point in the spear. And I have been telling people. I mean, we need to make sure that our farmers have the financial support to maintain through this situation. We definitely need to make them a major part of the next COVID-19 funding package, and I will be there with you on the floor fighting for this.

Folks, as I keep telling people, food is our most important entity, and our farmers are the captains of the ship. But not only that, we have the energy in the name of our Committee, Commodity Exchanges, Energy, and Credit. That means our Committee, Ranking Member, we are the engine to move this and the first order of business is for us to move to start getting this financial package together so we can start advocating it right now. And I am sure I am speaking to staff. We need to be the ones that lift up our farmers, given this pandemic.

Now, I have heard a lot about e-RINs. We need to make sure that is alive and well. Our good friend, Mr. Harris, from down in Georgia, when I asked him what he felt was the most important thing, he said food labeling. A simple thing that can happen. We need to make sure we take care of that. And getting the type of financial backing to our farmers who are really out there working in a pioneering way with renewable fuels.

And you mentioned another thing when we talked with a few other people about the impending—when we had the possible food shortages, the meat shortages, because of the processors, our processing plants, Tyson and Smithfield, all went down because of this and we had to move. There is so much out there, and we need to be the Committee, and we are, as long as I am Chairman, as long as you are Ranking Member, or if it goes the other way and you become Chairman and I am Ranking Member, you can believe that the Scott brothers, me and you, we are going to make sure that our farmers are getting the financial respect that they need and deserve, and that we make sure we lift them up.

So, I want everyone to know how much we really appreciate it. This was excellent testimony. I learned a lot today, and we are going to carry this on and build on this, and our number one priority, I think you and I agree, is to get a COVID-19 package ready for the next tranche that we have, and we have to start on that right now. And Ashley, I know you are capable of carrying that mission out. We have a great staff. I want to thank you also for putting this together, our very first hybrid. It looks like we may be doing this for quite a while, and I have to get better. I got to get me a mask that will keep up. But we will do it, simple things like that.

And now, under the Rules of the Committee, the record of today's hearing will remain open for 10 calendar days to receive additional material and supplementary written responses from the witnesses to any questions posed by a Member.

This hearing of the Subcommittee of Commodity Exchanges, Energy, and Credit is adjourned. Thank you all very much.

[Whereupon, at 11:51 a.m., the Subcommittee was adjourned.]

[Material submitted for inclusion in the record follows:]

SUBMITTED ARTICLE BY HON. AUSTIN SCOTT, A REPRESENTATIVE IN CONGRESS FROM GEORGIA

[<https://www.bloomberg.com/news/articles/2019-09-17/bill-gates-says-wind-solar-subsidies-should-go-to-something-new>]

Bloomberg

Climate Changed

Bill Gates Says Wind, Solar Subsidies Should Go to Something New

By CHRIS MARTIN (<https://www.bloomberg.com/authors/ABooutJPfdo/chris-martin>) and ERIK SCHATZKER (<https://www.bloomberg.com/authors/AB7kAcfmyqc/erik-schatzker>)

September 17, 2019, 12:01 AM EDT



Gates says more subsidies should go to renewable energy storage and offshore wind.

Editor's note: the video is retained in Committee file and available at: <https://www.bloomberg.com/news/videos/2019-09-17/bill-gates-calls-for-more-subsidies-for-energy-storage-offshore-wind-video>.

It's time wind and solar passed their subsidies along to emerging technologies that need them more, Microsoft Corp. co-founder Bill Gates says.

After decades of government incentives, wind and solar have been deployed *widely enough* (<https://www.bloomberg.com/news/articles/2019-06-18/the-world-will-get-half-its-power-from-wind-and-solar-by-2050>) for manufacturers and developers to become increasingly efficient and drive down costs. Now they can probably survive without them, Gates said in an interview with Bloomberg Television.

"The tax benefits there should be shifted into things that are more limiting, like energy storage, offshore wind—which still has a huge premium price," said Gates, who co-chairs a *global group* (<https://gca.org/global-commission-on-adaptation/our-mission>) of business, political and scientific leaders formed in 2018 to push for investments to help the world adapt to climate change.

U.S. states including New York, New Jersey and Massachusetts see proposed offshore wind farms in the Atlantic Ocean as crucial ingredients to phase out fossil fuels and fight climate change. But the costs of building wind farms at sea are still nearly twice as high as on land. Energy storage, meanwhile, is key to allowing wind and solar plants to dispatch power even when the sun sets and breezes go slack. But big batteries remain expensive, too.

"The progress in solar and wind is very helpful," Gates said. "But the sun doesn't shine 24 hours a day."

SUBMITTED STATEMENT BY HON. ANTHONY BRINDISI, A REPRESENTATIVE IN
CONGRESS FROM NEW YORK; ON BEHALF OF DAIRY FARMERS OF AMERICA

Dairy Farmers of America (DFA) appreciates the opportunity to comment on the impacts on farm income and rural communities as a result of on-farm energy production. In 2009, we formed DFA Energy (www.dfaenergy.com), an entity created to assist DFA member-owners as they navigate the complex field of on-farm energy conservation and production. Since then, DFA has been invested in and promoting the opportunity for on-farm energy production to member farms as a way to diversify their income, address environmental issues and become more energy independent.

DFA is the country's largest milk marketing cooperative, owned and governed by 13,000 dairy farmers nationwide. DFA's member-owners are invested in 87 processing facilities that produce a wide range of dairy products, including fluid milk, cheese, butter, ice cream and dairy ingredients.

Dairy farmers raise their families and their herds on the same land. As thoughtful stewards of the land, they understand the value of protecting and improving the resources on their farm to ensure future generations have the opportunity to pursue the same profession. As renewable energy alternatives have emerged and grown in the marketplace, DFA has encouraged its members to consider options that will both strengthen family farm finances and improve the environment.

The utilities that have provided electricity to farmers, and society more generally, have traditionally relied on fossil fuel-based generation. Most electricity consumers have had few, if any, alternatives. The growth of renewable energy alternatives has created an opportunity for consumers to choose the source of the energy they consume.

When interested in learning more about energy opportunities on the farm, DFA Energy encourages dairy farmers to begin with an energy audit. Energy audits are partially reimbursable through the U.S. Department of Agriculture's Environmental Quality Incentive Program (EQIP). The audit creates a necessary baseline of analysis: how much energy does the farm use? What machinery does the energy power? What is the energy efficiency of this machinery? How can the farm operation save money while increasing its efficiency? The audit helps farmers to think more intentionally about their energy consumption. It also outlines potential opportunities for energy production alternatives as a source of cost reduction and income diversification.

A DFA member-farm in Massachusetts is a great example of how agriculture can play a role in the creation of renewable energy. The family began considering on-site energy production as a way to diversify and grow their revenue. In 2012, the farm's energy audit provided an analysis of its electricity usage on the 250-cow dairy and determined that a 55-kW roof-mounted solar project could save the farm \$24,000 per year in electricity costs. In 2013, that same farming operation leased 11 acres of marginal farmland to a solar development company for a project that has generated \$61,500 in income per year.

Massachusetts' state solar policy has been one of the most progressive in the country; so, in 2016, this farm added 145 kW of solar panels on a building it owned. The operation sold the power at reduced rates to a nearby restaurant and was able to benefit from Solar Renewable Energy Certificates. This project has generated this farm family \$20,000 annually. Now comfortable with the technology, the farm invested in a 16-kW system at a small camp site the family owns next to a local pond in 2017. This investment saves them \$4,500 annually. Their effort continued in 2019, when they entered into a 7 acre lease for solar development, again on marginal farmland, which generates \$27,000 in annual lease revenue. Most recently, this operation has entered into lease options for energy storage projects that are still being developed. If the economic benefits of these projects are summed, solar electricity represents a significant net economic gain of \$137,000 per year for this dairy farm family.

This farm's owners have raised three children, now adults. Knowing that land was limited in their area, they knew they had to identify creative ways to grow farm income so their children would have opportunities to return to the operation to raise their families on the farm as well. This farm and the next generation have a robust future. They are excited about the opportunities that have been created for them and hope to expand into more energy storage and anaerobic digestion. The farm continues to produce nutritious milk as it seeks to expand its production of renewable energy.

On-farm energy production is size neutral. The Massachusetts farm would be considered a small- to mid-sized operation, based on herd size. Larger farms can also benefit from on-farm energy production. DFA Energy has helped farms of all sizes

realize their potential for energy production through solar, wind and anaerobic digestion, which often adds the benefit of odor mitigation and quality fertilizer as a by-product.

It is important to note that as farms consider their options in the renewable energy field, projects have more success and more impact if state and Federal policy and incentives work together to support the project's development. Again, Massachusetts has prioritized renewable energy development, which has led to benefits on the farm and to consumers. More consideration of supportive policy and infrastructure will be needed to allow farmers nationwide to benefit from this emerging field.

DFA Energy has worked diligently to identify partners to service the diverse renewable energy needs of DFA member-farms. We seek partners that are experts in the field, that understand the complexity and priorities of dairy farms, and that will help farms solve problems and meet their business goals. While there are many credible companies in this field, DFA Energy has a trusted, preferred partnership with Jordan Energy & Food Enterprises, a solar development company that specializes in developing solar projects on farms. DFA Energy has a similar relationship with Vanguard Renewables to promote and develop anaerobic digester projects. The business model for anaerobic digest[er]s on farms is diverse. In projects with Vanguard, the company oversees operating the digester, using the manure from the farmer's herd as a feedstock. DFA dairy farmers who pursue these projects supply the manure and also benefit from a lease payment for the land on which the anaerobic digester sits. Vanguard then converts the manure into usable gas. Vanguard and Jordan Energy have even begun conversations relative to using the solar-generated electricity to supply the anaerobic digesters' needs. In those cases, DFA member-farms can gain benefit through development of both on-farm solar generation and anaerobic digesters.

DFA's commitment to renewable energy extends beyond the farm. We have been reviewing potential opportunities at our milk processing operations as well. For example, DFA and Jordan Energy & Food have entered into a Power Purchase Agreement at DFA's Middlebury Center, Pa., facility. This agreement will result in our DFA plant having access to a renewable source of energy to process milk into dairy products for consumer consumption.

As DFA looks to the future of dairy farming, we believe it is critical that we continue to provide farmers with opportunities for new revenue streams. We believe there is great opportunity for all of rural America in the continued development of on-farm renewable energy generation. The impact to rural communities, to rural economies, can be great and continued investment should be prioritized and supported.

DFA appreciates the opportunity to provide these comments. On-farm energy production should be promoted and supported through state and Federal policy that encourages farmers to investigate and pursue opportunities in this field as they continue producing nutritious and wholesome dairy products each and every day.

SUBMITTED QUESTIONS

Questions Submitted by Hon. Stacey E. Plaskett, a Delegate in Congress from Virgin Islands

Response by Jim Falk, President, Falk's Seed Farm, Inc.; Co-Owner, Falk Farm; on Behalf of Minnesota Farmers Union, National Farmers Union

Question 1. Thank you Chairman Scott for recognizing me and thank you to the witnesses for sharing their experiences and best practices.

In 2012, the National Renewable Energy Laboratory did a site-specific evaluation and analysis on wind power opportunities in the U.S. Virgin Islands. The report concluded that St. Croix's geography and access to trade winds may in some respects be the most viable place for utility-scale wind generation.* This would contribute to our goal of reducing fossil energy consumption by 60% by 2025. But, of course any project of this magnitude would require new investments across various sectors.

You shared how a hybrid wind and solar system, especially the solar system, has been a great investment that has produced significant benefits. What would say is the main impediments in keeping farmers or stakeholders from investing in renewable systems?

* **Editor's note:** the report referred to is retained in Committee file and is available at <https://www.nrel.gov/docs/fy12osti/55415.pdf>.

Answer. The significant up-front cost of installing a renewable energy system is an impediment to a lot of farmers and ranchers. The installation of a renewable energy system is a long-term investment, projected to provide power for 20 years or longer. Tax incentives and USDA's Rural Energy for America Program grants have helped stimulate activity in the past. However, there has not been enough funding for REAP grants to satisfy the demand of people applying with qualifying projects. Many farmers and ranchers do not have the cash needed to proceed with a project without knowing they will receive the REAP grant. In addition, lenders are often skeptical of funding these projects, not knowing if the grant will come through for their customer. On farm renewable energy systems are the most efficient use of power, when the energy produced is used directly on site, or in the neighborhood through the local grid. That's why extended tax credits for small wind and solar, along with more funding for REAP grants, are so important to advance on farm renewable energy systems. On farm renewable energy systems benefit the farmer or rancher, the local electric distribution provider, and society in general in many ways, including the offset of peak demand on the grid, locally and nationwide. The on again/off again roller coaster approach to tax incentives and REAP grant funding is negative to the small wind and solar industry as they try to plan for demand in an uncertain market. Therefore, some consistency, for an extended period of time, is critical to advance this important energy policy of producing energy on the farm where it is consumed. In addition, more research is needed to integrate better and more efficient systems going forward, utilizing the latest cutting-edge technologies.

Another impediment can be the lack of access to the local grid to install a renewable energy system, or the cost associated with fees charged by the electric distribution provider to allow the farmer or rancher to connect to the local grid with a renewable energy system. In many situations, the rural electric co-op or electric distribution provider is charging the farmer or rancher a monthly fee for installing a renewable energy system to offset their loss of revenue from that farmer or rancher, who is now buying less power from the electric distribution provider. This is an extremely negative development in my opinion, as we try to address climate change, resolve peaking issues on the local and national grid, and move to more efficient energy use by producing power where we use it. If the fees charged to connect a renewable energy system to the local grid are too high, the system will not be profitable enough to be viable in the eyes of a lender. In general, many electric energy providers incentivize their consumers to purchase LED lighting, or more efficient motors, or off-peak heating/cooling systems with rebates to use less electricity. Isn't it odd that farmers and ranchers should be charged a fee, much like a penalty, for reducing their energy demand with a renewable energy system? It seems hypocritical to me, that farmers and ranchers are charged a fee for actually helping mitigate the cost of peak demand by offsetting some of the need for the electric energy providers to buy the more expensive peak power to satisfy their local energy demand. Our goal should be to make it easier, not harder, to advance these mutually beneficial energy systems.

Question 2. The Virgin Islands largely produces food in sustainable systems that rely little on off-farm inputs. On average, off-farm income accounts for over 90% of farm operator household income in the United States. It would be ideal for farmers across the country to rely mostly on their on-farm income.

What risk would you consider in deciding to add on-farm energy production to your operation and how do you manage those risks?

Answer. There are a number of risks that need consideration before installing a renewable energy system. We addressed the risk of not receiving the grant funding or not having tax incentives in your first question. In our situation, we decided we wanted to reduce our carbon footprint and that because of our power needs, we would proceed with our wind and solar projects even though we did not receive the REAP grant for either project. We also decided to proceed with both because the level of tax incentive was projected to be declining, and that was something we could count on, after not receiving the REAP grant. You can see how important both of these tools are to advance the installation of more on farm systems. Our business is well established, and we expect to be continuing for many years, knowing that our electric power needs are quite significant annually. Therefore, we felt we could take the risk of installing both systems and we would eventually be able to pay for them. Other operations might not have such a consistent use of power annually and struggle to justify proceeding with an install if they don't have both the REAP grant and some tax incentive going forward. Repair and maintenance is a risk for any system. Working with a reliable company that can provide professional maintenance services is important over the projected life of the system.

Response by Hon. Bryan J. Sievers, Owner, Sievers Family Farms; Chief Operating Officer, AgriReNew; Vice Chair, Board of Directors, America Biogas Council

Question 1. In 2012, the National Renewable Energy Laboratory did a site-specific evaluation and analysis on wind power opportunities in the U.S. Virgin Islands. The report concluded that St. Croix's geography and access to trade winds may in some respects be the most viable place for utility-scale wind generation.* This would contribute to our goal of reducing fossil energy consumption by 60% by 2025. But, of course any project of this magnitude would require new investments across various sectors.

You shared that for every dollar of Federal assistance you received, you were able to secure almost an additional \$5 in private investments. Do you think your experience is typical? What advice would you offer to farmers seeking investment on renewable energy?

Answer. For those anaerobic digester (AD) facilities that were built after the passage of the American Recovery and Reinvestment Act of 2009 I do believe our experience is typical. Because of this important piece of legislation, we were able to leverage this assistance, along with other government programs, such as USDA's REAP and EQIP programs into an additional approximately \$9 million in private investment to finance the construction of our facilities. Without this assistance we would not have been able to construct our AD facility and would not have been economically viable.

My advice to others who are seeking investment opportunities in anaerobic digestion and renewable energy facilities is to do your homework and make sure your motives go beyond economic incentives. Our family has always pursued the objective to ensure that the natural resources we are blessed with (air, land, water, sun, and the people we work with) are used for the highest and best use. We have always focused on how we can provide solutions for the land we farm which will ensure a more resilient, healthy resource for future generations to produce, food, fuel, feed, fiber, and energy.

Question 2. The Virgin Islands largely produces food in sustainable systems that rely little on off-farm inputs. On average, off-farm income accounts for over 90% of farm operator household income in the United States. It would be ideal for farmers across the country to rely mostly on their on-farm income.

What risk would you consider in deciding to add on-farm energy production to your operation and how do you manage those risks?

Answer. There are a number of risks and challenges that must be considered such as management capabilities, labor resources, private and outside capital availability, liquidity, grants, renewable energy incentives, availability of feedstock for the anaerobic digesters, management of output from the anaerobic digesters, whether to take off-site feedstocks, and how are off-site feedstocks handled once they arrive. Finally, the biggest risks revolve around the economic viability of the on-farm renewable energy facility. Not only is the price the producer receives for the renewable energy produced (biogas, renewable natural gas, renewable electricity, renewable thermal energy, and digestate produced from the digesters are all potential revenue streams from the energy and material produced) an important consideration but making sure you maximize uptime and minimize downtime. The American Biogas Council is tremendous resource that should be utilized that will help anyone interested in researching and developing an anaerobic digester facility. The operators of these facilities, along with the engineers, technicians, consultants, management firms, private equity investment groups, and many others can provide significant resources and help to those interested in pursuing an anaerobic digester project. The one thing that none of these organizations or resources cannot provide is the drive or passion for doing the right thing with our natural resources for the protection, preservation, and enhancement of our environment. As long as the drive or desire is present, however, there will be significant resources available to manage the risks involved with designing, developing, engineering, constructing, and operating an on-farm anaerobic digester facility.



***Editor's note:** the report referred to is retained in Committee file and is available at <https://www.nrel.gov/docs/fy12osti/55415.pdf>.