WRITTEN STATEMENT OF
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SENATE AGRICULTURE COMMITTEE

ON

“Farm Bill 2023: Rural Development and Energy Programs”

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Introduction

Chairwoman Stabenow, Ranking Member Boozman, and Members of the Agriculture Committee, thank you for holding this important hearing and for inviting me to participate. I am honored to share my experience of over 20 years in innovating, developing, and commercializing technologies that bring to market more sustainable and cost-effective ingredients and materials sourced from agricultural inputs, helping to promote the concept of value-added agriculture. I look forward to sharing how Geno's innovations can help power the U.S. to become the global leader in biomanufacturing while benefitting the American farmers who grow plant-based feedstocks that serve as the primary raw material that our technologies convert into widely-used products.

My name is Christophe Schilling and I am born and raised in Michigan and today the founder and CEO of Geno, a company on a mission to accelerate the Materials Transition, creating high performance ingredients from renewable sources like plants rather than producing them from fossil fuel inputs. I'm a board member of the Biotechnology Innovation Organization's (BIO) Agriculture and Environment group and Chairman Emeritus of BIOCOM California, representing more than 1,500 California based life-sciences companies.

Through the science and process of fermentation, Geno's technology transforms plant sugars into widely-used materials for markets including apparel, beauty, home care, nutrition, automotive, and industrial coatings and packaging. Our technologies have won numerous awards including being one of the only companies to have received three separate US Presidential Green Chemistry Awards (now referred to as the EPA Green Chemistry Award). As consumers around the world become increasingly sophisticated about purchasing sustainable products with traceable supply chains, our ingredients are in demand from brand partners like Cargill, Unilever, lululemon, Kao and others who are eager to transition to more sustainably sourced materials to meet their customer expectations.

Over the past 22 years, our company has scaled our technologies thanks to the diligent work of our more than 200 scientists and engineers largely-based in San Diego, along with key grants from government programs like SBIR and BioMADE, headquartered in Minneapolis.

Launched through Department of Defense (DOD) funding, BioMADE connects industry and academia to enable sustainable biomanufacturing through innovation, education and collaboration. These partnerships have been essential to scaling and commercializing, including US-based efforts to scale one of our most prolific technologies – 1,4-butandeiol (BDO) – to be manufactured from renewable plant-based inputs, rather than from fossil inputs as is current practice for the over 3 million tons of conventional BDO produced each year. These scaling and commercialization efforts included piloting in Lansing, Michigan with the Michigan Biotechnology

Institute, a multi-year pilot plant operation in Decatur, Illinois, commercial-scale demonstrations to produce thousands of tons of product in Loudon, Tennessee with DuPont Tate & Lyle Bioproducts, and today one of the most significant global projects underway in biomanufacturing with our partners at Qore, a joint venture between Cargill and Helm, in Eddyville, Iowa. Qore has constructed the world's largest bio-BDO facility powered by Geno, a $300M capital investment. The bio-BDO that is manufactured in the Iowa facility offers up to a 90 percent carbon reduction compared with current technology that is created using fossil fuels.

We also perform finishing manufacturing outside of Canton, Georgia, for a GRAS-certified product that we deliver directly to the market serving nutrition needs. As Geno looks to build our first biomanufacturing facility, we see great opportunities to locate this facility in the U.S. with the prospect of utilizing the 9003 loan guarantee program which I will discuss later in my testimony.

While we are heartened to see the recent emphasis and investments in biomanufacturing that are included across the CHIPS and Science Act, the Inflation Reduction Act (IRA) and the Executive Order on Biotechnology and Biomanufacturing, the programs within the energy title of the Farm Bill lay at the center of one of the most critical paths to translating US-based biotechnology innovations into U.S. leadership in the manufacturing of value-added products from our abundant domestic agricultural feedstocks.

Today, I will focus my testimony on these two important programs – the 9002 BioPreferred program and the Biorefinery, Renewable Chemical, and Biobased Product Manufacturing Assistance Program, also known as the Section 9003 program.

Strengthening the 9002 BioPreferred Program Promotes American Made Products and Feedstocks

Geno commends this Committee for reviewing the effectiveness of the BioPreferred program which aims to grow the market for biobased products. We know the program first hand. One of our beauty products , Brontide™ (butylene glycol), underwent the rigorous process to be BioPreferred certified and represents an alternative to the conventional butylene glycol products on the market today that are sourced from petroleum inputs and specifically made from acetaldehyde, a carcinogen. Brontide™, used as a moisturizing agent in personal care products, is not only safer but also reduces greenhouse gas emissions by 50 percent compared to a petroleum based production process.

While companies like Geno have innovated to create products that reduce our reliance on petroleum and increase the use of U.S.-grown plant-based feedstocks, we have not seen market demand resulting from the BioPreferred program similarly shift. We believe that more must be done to strengthen the program and meet its goals of spurring economic development, creating new manufacturing jobs and providing new markets for farm commodities.

First, the mandatory purchasing requirement for federal agencies and their contractors is a major part of the program and government must re-commit to meeting these requirements. This part of the program is and should continue to be a mainstay for how the program serves as an advocate and accelerator for bio-based products. It is important to set yearly requirements to define what percentage of government procurement must contain BioPreferred products so that progress can be tracked year over year.

Second, the intent of the BioPreferred program to open new markets for biobased products should be expanded to consider the entire supply chain. For example, the majority of flags in the U.S. are today produced from petroleum derived nylon. Geno is in the process of scaling the production of bio-nylon to replace conventional nylon, which could then be used to make flags such as the US flags in this room. However, procurement officers typically engage with the producers of finished goods rather than manufacturers of ingredients like Geno or our direct partners further up the supply chain. We strongly urge procurement officers be proactive, both to establish minimum bio-based contents and/or to elevate the minimum content for product categories already designated under BioPreferred. Moreover, if an input raw material is available from a US-based biomanufacturer, that material should be given preference in government purchasing decisions. We look forward to a future where the flags flown in rooms like these are made in the U.S. out of nylon fiber produced in the U.S. from U.S. grown feedstock.

Third, the 2018 Farm Bill called for the U.S. Department of Agriculture (USDA) to work with the Department of Commerce (Commerce) to develop North American Industry Classification System (NAICS) codes for renewable chemical manufacturers and producers of biobased products. This development has stalled at the Office of Management and Budget (OMB) and without dedicated NAICS codes, federal agencies cannot accurately classify, collect data or report on the growing biobased economy. We urge this Committee to ask USDA, Commerce and OMB to establish NAICS in order to better measure the scope of biobased products on the market.

Lastly, more must be invested to educate the public about the benefits of being BioPreferred certified. The Biden Administration's recent Executive Order on Biotechnology and Biomanufacturing included expansion of market opportunities for biobased products as a key driver of creating well-paying jobs. The BioPreferred Program offers perhaps the most direct path to achieve this objective. More education will lead to more market demand for products like the ones Geno makes and ensure that the program meets its intent of creating additional markets for value-added goods derived from the labor and fruits of American farmers.

USDA 9003 Loan Guarantee Program Bridges the Gap in Translating Innovation to Commercial Realization

Geno's technology is enabling a dramatic shift in the production of biobased products by making it possible to produce an increasing array of widely used building blocks from agricultural inputs rather than fossil inputs, and to do so at relevant commercial

scales. A key example of that is the $300m capital investment supporting a commercial-scale plant under construction in Eddyville, Iowa by our partners at Cargill that will produce 65,000 tons of bio-BDO. Earlier, I mentioned our technology that is scaling up to produce bio-nylon, which has notably lower greenhouse gas emissions than conventional alternatives. This product already has a global market of $10B but sourced from fossil fuels. In the coming years, we intend to drive the establishment of a commercial-scale facility to meet the rising global demand for a more sustainably sourced alternative to nylon. A first-in-the-world Geno-powered bio-nylon facility would be a breakthrough for this particular chemical and we anticipate initial production capacity could be well over 30,000 tons per year, with an aim to expand to over 100,000 tons per year.

Programs like the USDA 9003 loan guarantee program are critically important to companies like Geno that are looking to bridge the gap between successfully building a proven technology and establishing a broad-based biomanufacturing infrastructure in the US. As with most biomanufacturing, we would anticipate locating a facility close to the feedstock source, and work with American farmers to create a market for climate-smart and sustainable agricultural production practices. Not only would such a facility utilize domestic biomass, it would create well-paying manufacturing jobs in rural communities while making ingredients in America that have significant greenhouse gas reductions compared to their conventional counterparts at a cost-competitive price.

To achieve this vision, we ask first that this Committee ensures an appropriate funding level for the 9003 program in the next Farm Bill and consider removing the cap for funding, currently at $250 million, given the current record inflation and the modern costs of construction Second, we ask USDA to streamline the 9003 program so that it moves at the pace of business. Currently, the review process from submission to decision can take up to 18 months to complete. For companies that face market pressures to deliver quickly and at scale, this timeframe is too long and deters qualified applicants.

As we look to deliver in the coming years on our first biomanufacturing facility, the U.S. is increasingly a more attractive place to invest in given the current energy and security risks in other parts of the world, the proximity to low-cost and high-quality feedstock and the recent commitments to biomanufacturing made in landmark legislation and by Executive Order. We urge this Committee and USDA to ensure that funding from the 9003 program be quickly accessed by companies at the forefront of bolstering U.S.-based biomanufacturing.

Supporting U.S.-Based Biomanufacturing Alleviates Supply Chain Disruptions While Providing Climate Solutions

The recent pandemic, climate and energy crises and record inflation have created unprecedented pressures on a global scale while driving demand for more sustainable, regionally secure and resilient supply chains. Moreover, in the 2022 Global Risks Report released by the World Economic Forum, the top two risks to the global

economy are cited as one, climate action failure, and two, extreme weather.[1] Recognition of these risks is driving increased awareness by consumer brands of the pitfalls embedded in supply chains that are geographically dispersed with low visibility.

At Geno, we aim to create a fully transparent and traceable supply chain that starts with sourcing our feedstock from American farmers. When asked by our brand partners and consumers "Where does my product come from?" our goal is to be able to trace the feedstock that go into our ingredients down to the farm where it was harvested.

We've built our technology to have the capacity to play an important role in providing climate solutions, at scale. To give a sense of Geno's potential impact, if we replaced current petroleum-derived ingredients on the market with their plant-based counterparts, we could reduce the emission of 85 million tons of carbon dioxide annually. This is the equivalent of taking more than 18 million cars off the road each year.

In summary, the U.S. has the raw materials, the technology and the talent to be the world leader in biomanufacturing. The time to invest in building this important industry is now and we are ready to get to work.

Thank you for the opportunity to testify today and I look forward to working with the Members of the Senate Agriculture Committee and USDA to drive the biomanufacturing revolution.

[1] World Economic Forum: Global Risks Report 2022, *available at* https://www.weforum.org/reports/global-risks-report-2022/digest.