Written Statement for the Record

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Advanced Biofuels: Creating Jobs and Lower Prices at the Pump

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Thank you, Chairwoman Stabenow, Ranking Member Cochran and members of the committee for the opportunity to testify today in support of advanced biofuels and how they may lead to job creation and lower prices at the fuel pump.

My name is Dr. Sumesh Arora and I serve as the vice president of Innovate Mississippi, an independent nonprofit organization that champions innovation and technology-based economic development. I have worked in corporate research for 13 years in the chemical process industry and have 12 years of experience in the renewable energy sector. My Ph.D. in international development has given me an opportunity to study the human side of technology adoption and how new innovations may be diffused among various populations.

I hope to provide a perspective on how advanced biofuels and bioenergy development and deployment may be accelerated in the Southern United States, where considerable related activity is already taking place on multiple fronts.

In the time I have today, I will address five challenges and opportunities for furthering the domestic development of advanced biofuels and biomass-based energy options:

1. This industry is still in its infancy. Currently there is no "dominant design" for advanced biofuels technologies or feedstocks, which means that many different technologies are being perfected that can use a wide variety of feedstocks. This opens up opportunities for many technical and business innovations in this sector from deploying very large scale systems to small modular and even on-farm

systems. Achieving the concept of dominant design makes a technology more bankable and much easier to be adopted by the masses. There is, however, a significant need to educate entrepreneurs and investors on how to mitigate risks associated with developing successful ventures in this space. It is important to look at risk in five key areas as these businesses evolve: technology, markets, management, finance and execution. Innovate Mississippi, through its Strategic Biomass Solutions program, has developed the Renewable Energy Venture Startup (or **REVSup** for short) Academy, which does just that- educate entrepreneurs to mitigate risk. REVSup workshops have been conducted all over the country in the last three years. Linking business plan competitions and business accelerators around the country is critical to encourage investment in new ventures.

2. Many parts of the country, especially the Southeastern United States, are well suited to generate current and emerging feedstocks in an ecologically sustainable manner, which can provide very effective regional solutions. For example, forestry and poultry are two of the biggest industries in the Southeastern United States that can supply feedstocks currently for advanced biofuels. Emerging dedicated energy crops such as grasses and algae also grow well in this climate, but additional research and market development is still needed to optimize the feedstock supply chains.
3. Deployment of these technologies will lead to an increase in the number of STEM (science, technology, engineering and mathematics) related jobs across the country, which will be difficult to off-shore and will also lead to rural wealth creation. However, we need to better connect and leverage federal research assets with local

universities, schools, business and nonprofit organizations to accelerate the development of these technologies. For example, Innovate Mississippi is the original member among nine partners with the USDA Agricultural Research Service (ARS) to facilitate commercialization of ARS research through the Agricultural Technology Innovation Partnership (ATIP). I applaud the 2014 Farm Bill for urging the Department to move forward with further development of public-private partnerships to provide venture development training for innovative technologies.

4. Advanced biofuels should not be limited to just liquid fuels, but should be viewed in a more comprehensive manner to include viable biomass-based energy and biochemical options in gaseous, liquid and solid forms, thereby necessitating a long-term and stable policy that provides clear market certainty. The announcement by President Obama March 28 unveiling a strategy to curb methane emissions does that to a great extent; however, the national Biogas Roadmap scheduled to be released in June this year is expected to focus primarily on the dairy industry, which is quite small in the south compare to poultry. Millions of tons of poultry waste is generated in states from Maryland to Arkansas and the contributions to biogas production from this very viable feedstock have largely been ignored. There are tremendous entrepreneurial opportunities in developing such systems that can lead to rural job growth and keep energy prices low for farmers, while improving soil health.
5. A large enough volume of advanced biofuels and biomass-based energy options in the overall mix will help keep fuel prices in-check by diversifying our energy supply

and enhancing our national security, but market conditioning efforts led by various federal agencies must continue for greater adoption of such fuels.

Our work at Innovate Mississippi can be summed up in two words: ***"coach and connect***." While our mission and goal may sound simple, the work of coaching early stage innovation-based enterprises and connecting them with a wide variety of resources, including early stage capital, technical research and entrepreneurial service providers, is challenging. The ultimate goal is to create fast growing, commercially viable companies, which also yield great returns for the early stage investors. Innovate Mississippi relies on various sources of state, federal and private sector funding to provide such services at low or no cost to the entrepreneurs.

I am proud to say that, due to the combined efforts of many stakeholder organizations, Mississippi is emerging as a regional leader and the proving ground for commercial scale production of various advanced clean energy technologies such as woody biomass and MSW-based cellulosic biofuels, biogas production using poultry litter, torrefied wood pellets, thin film solar panels and energy efficient windows.

The need for a consistent, long-term energy policy for our country has been identified by many organizations. To quote Phyllis Cuttino, director of Pew Trusts' Clean Energy Program, whom we hosted in Mississippi in 2012 to hold one of five national roundtables, "predictable, long-term incentives are needed to usher this emerging industry as it approaches broad market acceptance."

In closing, I would like to reiterate that investing in renewable energy is just like investing for your retirement – it is about diversifying the portfolio and investing early. We have to diversify the nation's energy portfolio and begin moving away from a transportation sector that relies on nearly 93 percent of its demand from fossil fuels. Furthermore, just as it is not prudent to wait until we are about to reach retirement age to start investing in that portfolio, in this case, it means we cannot put off making serious investments in renewable forms of energy until the expiration of fossil fuels is imminent. Thank you.