

BIO Draft Position Paper **Climate Change and Biotechnology: Solutions through Innovation**

Introduction

The United Nations Framework Convention on Climate Change (UNFCCC) is a legally non-binding Convention body born out of the 1992 Rio Summit. The chief goal of the initial Convention was to stabilize greenhouse gas concentrations in the atmosphere. To accomplish this goal, Parties to the UNFCCC have drafted, and are currently negotiating, an international treaty on Long-term Cooperative Action (LCA). This treaty will represent a monumental paradigm shift in global environmental policy. The impacts on the environment and the global economy will be paramount. If policies are structured wisely, addressing climate change can help spur global economic recovery and development. A transition to a low-carbon economy, supported by both active private sector participation and government and multilateral institutional support, has the potential to drive the next generation of technological innovation, address the environmental and economic challenges that climate change presents, and contribute to global development objectives.

In order for the UNFCCC to achieve their ambitious targets, the clean tech revolution spurred by the recent climate negotiations will require scientific and technological innovation, investment from the public and the private sector, and robust enabling environments. The world's major industrialized and emerging economies have already embarked on the path to clean technologies and a green economy. However, the world's poorest nations, which are often the most vulnerable to the effects of climate change, will need support to take part in this exciting new economic system. Biotechnology can bridge the gap between developed and developing nations by providing the tools needed to mitigate and/or adapt to the effects of climate change and to effectively steward the environment.

Biotechnology: Solutions to Global Challenges

The Biotechnology Industry Organization (BIO) is a non-profit membership organization representing more than 1,200 biotechnology companies, academic institutions, state biotech centers, and related organizations in all 50 states. BIO members are involved in cutting edge research and development of healthcare, agriculture, industrial and environmental biotechnology products that are revolutionizing patient treatment, greatly expanding our ability to feed a growing world population, and most relevant to this matter, offering the promise of reducing our dependence on oil and other fossil fuels, leaving a cleaner environment for future generations.

At its simplest, biotechnology is the use of cellular and biomolecular processes to solve problems or make useful products. In the context of global climate challenges, biotechnology has the potential to increase food supplies, reduce pesticide damage to the environment, conserve natural resources, create alternative fuels from renewable sources without compromising the environment, and increase farm income. BIO member technologies can also be employed to develop healthcare products that can provide support to those coping with the effects of climate change. Because of its broad application, biotechnology



innovation has the potential to address some of the greatest challenges of our time. However, this innovation must be protected by a strong intellectual property framework that fosters predictability. This can significantly enhance the forward trajectory of innovation in clean technologies.

Agricultural Biotechnology

As the LCA states, “with land use being linked to sustainable development, adaptation, and mitigation, agriculture plays an important role, especially in the context of food security and poverty reduction.” To meet the needs of a growing population and changing climate conditions, we must increase agricultural production. There are only two ways to do this: either use more land, or produce more on less. Global agriculture is the single largest user of land (and water) already, and it produces major amounts of powerful GHGs. Our challenge, therefore, is to find ways to increase productivity of existing agricultural land, which will be vitally important to balancing the demand for food, fuel and fiber with the need to accommodate a growing world population, conserve natural resources, and reduce GHG emissions. Modern plant biotechnology can, and does, help. Indeed, BIO member companies provide now, and are developing, the innovative seeds and agricultural products that will enhance food production and lessen the impact of agriculture on the environment, including the reduction of greenhouse gases.

Advancements in agricultural biotechnology include new crop varieties that help reduce the risk of crop loss and enable more environmentally sustainable practices. For example, crops with built-in insect protection require fewer applications of insecticides, thus protecting non-target organisms that would otherwise be exposed to insecticides. Herbicide-tolerant crops have led to widespread adoption of reduced-tillage and no-tillage agronomic practices, which protect and enhance soil quality, reduce run-off of soil and agricultural chemicals, reduce fuel-use for tilling, and sequester carbon in the soil.

Additionally, agricultural biotechnology products in the pipeline include nutritionally enhanced foods, higher intrinsic yield crops, and crops with improved tolerance to drought or salt content. All of these products are helping to address today’s challenges of climate change, water scarcity, malnutrition, and the diminishing availability of suitable land for agriculture, all of which have the greatest impact on the world’s poor and hungry.

Industrial & Environmental Innovation

Industrial biotechnology provides a powerful set of additional tools to address climate change. Biofuels, biobased products and bioprocesses will enhance global security, and enable the global economy to achieve the objectives of the UNFCCC.

Responsible, sustainable biofuels production will be an increasingly critical component of global security in the coming century, expanding global energy supplies, reducing dependence on petroleum, cutting greenhouse gas emissions, and creating economic opportunity in rural and developing regions. Furthermore, BIO represents advanced biotechnology companies that are developing innovative biological-based fuels utilizing non-food feedstocks and next generation crop varieties that improve land use efficiency and

enhance soil sequestration of CO₂. Biofuels are not a panacea, but are a vital part of the global energy future.

Biobased products and processes can also play a key role in the reduction of greenhouse gas emissions. Biobased products replace petroleum-based feedstocks with renewable biomass that circulates existing carbon dioxide (CO₂) instead of releasing additional fossil carbon into the atmosphere. Biobased products can also provide a range of additional environmental benefits, including reduced toxicity and biodegradability.

Advanced biotech manufacturing processes, such as microbial production of pharmaceutical intermediates and enzyme-based detergents, reduce inputs of heat and electricity, further reducing CO₂ emissions and energy use. And biotech researchers are even developing algae and other micro-organisms to remove existing CO₂ from the atmosphere.

In summary, biotechnology R&D companies are committed to nurturing the innovation pipeline and subsequent manufacturing capacity to build the next generation of energy efficient, renewable energy, and renewable fuel technologies.

The case for strong intellectual property protection

The path from basic research to a usable biotechnology invention is capital intensive and risky. For example, a typical biotech discovery such as an enzyme with a particular environmental activity can take years and millions of dollars to develop. But this enzyme may be instrumental in increasing crop yield, or converting biomass to biofuel. Moreover, the research and development of this enzyme can create high-paying jobs, increase research capacity and lead to future innovations.

Researchers and entrepreneurs generate capital investment by leveraging their intellectual property. In research intensive and risky technologies, the patent is the asset that helps the innovator to bring his initial discovery to fruition. Investors measure opportunities in the biotech sector through potential sales of the product and the strength and predictability of patent protection. Patents can also serve as the asset which can be transferred from one entity to another. As an example, a patented technology can be licensed from, say, a university to a small company where further research and development can take place. A strong intellectual property framework that fosters predictability can significantly enhance the forward trajectory of innovation in clean technologies.

Biotechnology has a role not only in addressing climate change, but also in helping to transform the global economy. Yet, the UNFCCC negotiating text fails to recognize the full impact and promise of this industry. The text is replete with provisions which would weaken intellectual property rights, the very lynch-pin of the industry. The June 2009 negotiating text of the AWG-LCA specifically calls for a prohibition on patents or for the compulsory licensing of patents on basic biotechnology inventions, including fields of technology that may relate to genetic or biological resources.

Other proposed provisions of concern include eliminating environmentally sound technology from patentable subject matter; revoking existing patents on ESTs; mandating patent or technology "pools" to provide for access to proprietary technology on a royalty-free or

“affordable” basis; mandating compulsory licensing for particular “green” fields of technology; expanding provisions in the Agreement on Trade-Related Aspects of Intellectual Property (TRIPS Agreement) for additional exceptions and limitations in “special or exceptional” situations; and establishing a new international body or institutional arrangement under the UNFCCC to address technology-transfer related issues, including intellectual property issues.

Indeed, these proposed provisions imply that the international intellectual property system poses a barrier to developing, deploying, and accessing new innovations. Nothing is further from the truth. It is precisely through these protections that green technologies, green jobs and a greener earth will be created.

Conclusion

Utilizing biotechnologies throughout the global economy could advance the UNFCCC goals of both sharply reducing greenhouse gas emissions and encouraging cleaner and more sustainable energy resources. BIO and its member companies encourage governments in their deliberations to support the deployment of these technologies. BIO also urges governments to enforce strong protections for the technologies and market mechanisms that have delivered hundreds of new medicines, revolutionary new crops, healthier foods, and new sustainable energy sources.

Our industry wishes to work collaboratively with governments around the world to explore technological and policy solutions by using effective mechanisms for innovation, investment, and growth, and ultimately to help advance our ability to meet our global climate challenge.