The American Council on Germany

and

The University of California, San Diego

"Biotech to Biofuels: How New Technologies Are Changing Transatlantic Relations"

January 11-13, 2007
La Jolla, California

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The German Marshall Fund of the United States
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CONFERENCE REPORT

Introduction

From January 11 through 13, 2007, the American Council on Germany held a conference on new technologies and their impact on the evolving transatlantic relationship titled **"Biotech to Biofuels: How New Technologies Are Changing Transatlantic Relations."** The conference was conducted in La Jolla, California, in partnership with the University of California, San Diego, and with generous support from the German Marshall Fund of the United States, Bayer Corporation, DaimlerChrysler, and Volkswagen. The purpose of the conference was to bring together some of the best minds from the worlds of politics, industry, science, and ideas from both sides of the Atlantic to consider how innovative technologies are transforming relations among leading democracies in the 21st century. The conference was designed to encourage leaders in the United States to draw upon the knowledge and practices of Germans in the field of biofuels and to explore how Germans increasingly look to the United States in the field of biotechnology. Policymakers, scientists, and business leaders on both sides of the Atlantic will need to cooperate in these key fields if they are to contend with the wide range of global geopolitical challenges in the future.

This report highlights the key themes and ideas that emerged during the conference through summaries of each of the keynote addresses and working panels. The conference agenda and the list of participants appear at the end of the report. The presentations referenced in the report are available in full at www.acgusa.org.

Opening Keynote

To open the conference, **Garrick Utley,** Chairman of the American Council on Germany, welcomed **Ambassador C. Boyden Gray,** U.S. Ambassador to the European Union, who outlined the trade and regulatory challenges facing the United States and the European Union, particularly in the areas of energy and biofuels. Amb. Gray stressed that transatlantic relations in security, diplomatic, and political affairs are going well. Though there are occasional bumps, such as disagreements over privacy issues, optimism about future cooperation exists on both sides of the Atlantic.

ACG Chairman Garrick Utley, U.S. Ambassador to the European Union C. Boyden Gray, and ACG President William M. Drozdiak (left to right)

In matters of trade, Europeans remain anxious about U.S. protectionism in the agricultural sector. Amb. Gray described the European view that heavy subsidies to U.S. producers have the effect of both starving the developing world while dumping unwanted grains into their markets. In his estimation, biofuels and energy cropping have the potential to take the pressure off the agriculture sector and help push through a final trade deal for the stagnating Doha round of WTO discussions. The incentives for such a deal are strong, if not immediately evident. If the United States is able to meet European demands for a reduction in subsidies, the EU would feel pressure to follow in kind by eliminating tariffs on beef, pork, and poultry. This would not, however, provide true "market access" for U.S. entities, because many European agricultural regulatory hurdles would remain. Rather, Amb. Gray stressed, the United States should view Europe as a gateway to market access in developing countries: under WTO rules, reductions in tariffs in the developing world are pegged as a percentage to reductions in tariffs in the developed world. Lowering European tariffs effectively opens other markets to U.S. producers as well.

The differing regulatory challenges in the United States and Europe, Amb. Gray said, are due in part to history. Along the arc of U.S. history, consensus developed that central judicial review of conflicting or unfair regulations was necessary. States and individuals have the ability to sue when they feel inordinately or adversely affected by regulation. The court, in turn, may decide to abolish the regulation. At the EU level, on the other hand, there is no central judicial review of regulation. In essence, the European view that the United States and Asia are under-regulated stems from the unwillingness of individual European countries to relinquish judicial review to a central EU body. Thus there is no effective way for European entities to sue when they are inordinately affected by regulations. In this light, German Chancellor Angela Merkel's proposed "transatlantic marketplace" should not be thought of primarily in terms of trade, but in terms of harmonizing regulation to provide a climate more conducive to fair and robust trade.

Amb. Gray concluded by discussing how European experiences with energy regulation and climate change policies provide a window into the challenges of regulatory harmonization. The EU developed its Emissions Trading Scheme (ETS), a Europe-wide cap-and-trade carbon market, as a way to meet their Kyoto Protocol CO_2 emission reduction targets. Amb. Gray highlighted the struggles in the early years of the EU ETS: since emissions credits were initially over-allocated, some utilities simply continued to emit while banking or selling extra credits for profit; the ETS does not include the transportation sector, which largely eliminates oil from the program; offset cleanup projects in developing countries such as China have proven to be incredibly lucrative for local owners of dirty factories operating largely unregulated while funneling money from European entities trying to meet their ETS targets; and carbon capture and sequestration (CCS), a process many see as the climate change "holy grail," is not eligible for credit under the system. Amb. Gray predicted that the world is indeed moving toward a single emissions regime, and he strongly advocated that it be a market-based cap-and-trade program, otherwise it will be too messy. In the meantime, both the United States and the EU should vigorously pursue CCS. The lessons to be learned from the EU ETS regulatory scheme are many, he said, and the United States and EU should take these into account in years to come.

Panel I: Biotechnology in America, Europe, and Asia: Diverse Cultural Perceptions and Misconceptions

Dr. Peter F. Cowhey, Dean of the Graduate School of International Relations and Pacific Studies at the University of California, San Diego (UCSD) moderated the first panel of the conference, which featured remarks by **Dr. Lee M. Silver,** Professor of Molecular Biology and Public Policy at the Woodrow Wilson School of Public and International Affairs at Princeton University, and **Dr. Wilfried Prewo,** Chief Executive of the Hannover Chamber of Industry and Commerce (IHK).

In his presentation (Annex 1), Dr. Silver began with a scientist's overview of biotechnology. At root, biotechnology is the manipulation of living organisms. For molecular biologists, the basic units of structure are molecules, and the study of "life" is the study of energy processing at the molecular level. Energy processing later becomes information processing, from which the "designs" we recognize as living things emerge. Essentially, modern biotechnology is a reversal of the process, such that the design precedes implementation.

In contemporary applications, the two most controversial uses of biotechnology are in utilizing human embryos in medical research and therapies and in genetic modification of agricultural products (GMOs). Dr. Silver argued that culturally-specific religious and spiritual histories can exert overt or subliminal influence on the acceptance or rejection of various biotechnologies. National laws on embryo cloning, for example, reveal striking regional differences across societies. In the Americas, where the "neo-traditional Christian view" of life is predominant, national laws largely forbid embryo

cloning. In Asia, where societies have traditionally adhered to religions and spiritual practices that treat life as an eternal continuance, national laws largely permit embryo cloning. In Western Europe, which has a Christian tradition but is moving toward "post-Christian" secularism, beliefs in a personal God have been replaced with atheism, agnosticism, or a more nebulous sort of spirituality. National embryo cloning laws in Europe remain diverse and present a complex picture.

Similarly, in the Americas, where the neo-traditional Christian view holds that God has given man dominion over the earth and other creatures, GMO laws are largely permissive. In Europe, on the other hand, there is fierce resistance to GMOs, and Dr. Silver attributes this partly to the spiritual evolution of contemporary Europe. As Europeans reject traditional beliefs in a supreme and personal God in favor of an undefined "higher power" as polls show, they may also be transferring their reverence from "God above" to "Mother Earth below."

In conclusion, Dr. Silver said that when thinking about biotechnology issues in religious terms, it is important to remember that nearly every crop and organism on Earth has been intentionally manipulated by humans at some point in history. During a lively debate with conference participants, he stressed that the real and persistent problem of civilization, the one that continues to demand our attention, is that agriculture essentially eliminates wilderness.

In his remarks, Dr. Prewo discussed how biotechnology may be applied to the production of biofuels and presented (Annex 2) the current prospects for biofuels in Germany and Europe. There are four primary types of biofuels: bioethanol, biomethane, biomass, and biodiesel. Countries must determine which type of biofuel or mix of biofuels is most suitable for their societies, as well as decide from which sources that biofuel or mix should be derived.

Production cost is a major factor. In Germany, biodiesel from rapeseed remains the most economical, though it is still at least 50 percent more expensive to produce than traditional diesel from fossil fuels. It is also more expensive than, for example, bioethanol produced from sugar cane in Brazil, which is currently competitive with gasoline. Even with increasing capacity and new technologies, biodiesel in Germany will not be competitive with oil unless oil prices rise dramatically or biotechnology is harnessed to produce high-yield energy crops that bring down the cost of fuel.

Dr. Prewo delineated the policy measures that EU members have implemented to promote the production and use of biofuels. These include tax incentives, biofuel quotas, subsidies for land conversion from traditional to energy cropping, and tariff measures. He concluded by exposing some of the major contradictions of the European biofuels strategy. Germany and the EU seek to cultivate a healthy market share for biofuels and competitiveness with fossil fuels, but aversion to GMOs remains fierce. Current levels of protection for EU farmers also complicate matters, as few policymakers are willing to consider importing more economical and efficient biofuels from abroad, such as the Brazilian bioethanol from sugar cane. Negotiating these contradictions, he said, will be the major policy challenge for Europeans in the future.

Panel II: The Future of the Pharmaceutical Industry: Who Pays for Innovation?

Moderated by **Cornelia Stolze,** a freelance science and health journalist for the German media, the second panel of the conference focused on issues of funding for biotechnological research, particularly of the medical and pharmaceutical kind. **Dr. Attila Molnar,** President and CEO of Bayer Corporation, discussed the differences between the U.S. and European pharmaceutical markets and highlighted ways to maintain strong investment in the research and development (R&D) of new medicines. **Dr. Lawrence Goldstein,** Director of the Stem Cell Research Program at UCSD, discussed the importance of strong public investment in critical, early-stage "basic research," which occurs long before any product is brought to market.

In his presentation, Dr. Molnar said that in most developed democracies, health care costs have been increasing above inflation and GDP and will continue to do so in the foreseeable future. These costs are straining budgets and causing citizens to demand action from politicians to curb costs without sacrificing the high levels of service and comfort they currently enjoy. With the baby-boomers retiring in the United States and a rapidly aging population in Germany, the problem will only become increasingly acute for both societies.

Dr. Lawrence Goldstein, Director of the UCSD Stem Cell Research Program; Ms. Cornelia Stolze, science and health journalist; and Dr. Attila Molnar, President and CEO of Bayer Corporation (left to right)

The pharmaceutical industry is often unfairly targeted in this scenario, Dr. Molnar said; prescription drugs account for only 10 percent of health care cost, while the other 90 percent is paid to hospitals, doctors, and nursing homes or is absorbed by other health services and administrative costs. Thus, the increasing trend toward price controls on new prescription drugs as a way to ease rising health care costs is misguided. New and innovative medicines should not be seen as a burden on national health insurance schemes. In fact, Dr. Molnar argued, they reduce overall health care costs by shortening hospital visits and prevent costly complications from chronic diseases such as diabetes and high blood pressure.

In conclusion, Dr. Molnar said that in order to keep innovative medicines in the pipeline in this incredibly competitive environment, pharmaceutical companies must be afforded fair and accurate pricing, access to the free market, and protection of intellectual property. These, he said, are the three essential pillars of successful R&D.

Dr. Goldstein framed his presentation (Annex 3) by noting that while the pharmaceutical industry studies the “pull” of the market on the development of new drugs, it is equally important to consider the “push” of public investment in basic research.

The federal government, mainly through the National Institutes of Health (NIH), funds about 36 percent of all U.S. medical research. Most NIH-funded research focuses on basic science, which creates advances across many disease categories. Publicly funded research in general generates very high rates of return to the economy, averaging 25 percent to 40 percent per year. It is not always considered in this light, because in early stage research there is no tangible, marketable “product.”

In the pipeline to new therapies, there are roughly five phases: basic research, target discovery and validation, therapy development, clinical trials, and FDA approval & marketing. The cost of funding the research increases with each stage, but so does the potential for very high rates of return as a real product comes close to market. Accordingly, different actors tend to focus on different stages. Public funding begins to level off as the therapy moves past the first two stages and the cost of research increases. Because of the enormity of the costs of clinical trials and FDA approval, pharmaceutical companies begin to fund research during these stages. They do so when a product is fairly certain, when no other actor could afford to continue the research, and when there is the potential for lucrative returns. Sandwiched between publicly funded early-stage basic research and later-stage pharmaceutical research, venture capital and venture philanthropy fill the funding gap.

Public funding of basic science is healthy for local communities as well, Dr. Goldstein said. The top ten NIH-funded cities in the United States constitute ten of the top eleven biotechnology clusters in the

nation. In conclusion, he advocated strong and sustained public investment in early stage research, so that this engine of new therapies survives.

Panel III: New Cars, New Fuels? What are the Best Strategies for Reducing Oil Consumption? Can the United States Learn from Europe?

Dr. Freider Seible, Dean of the Jacobs School of Engineering at UCSD, moderated the third panel of the conference, at which conference participants heard insights from two automobile industry leaders: **David Geanacopoulos,** Director of Industry-Government Relations at Volkswagen of America, and **John Bozzella,** Vice President, Americas at DaimlerChrysler Corporation.

Mr. John Bozzella, Vice President, Americas, DaimlerChrysler Corporation; Dr. Frieder Seible, Dean of the UCSD Jacobs School of Engineering; and Mr. David Geanacopoulos, Director of Industry-Government Relations at Volkswagen of America

Mr. Geanacopoulos outlined the steps that Volkswagen (VW) is taking toward sustainable mobility (Annex 4). The company is committed to transportation that is economically, ecologically, and socially compatible, he said, and VW advocates both advances in engine technology and the use of new fuels.

There are three "generations" of alternative fuels, each requiring advances in car technology. The first generation includes conventional biodiesel, which is primarily in use in Europe, and conventional bioethanol, which is much more prominent in the United States. The wave of the future, however, lies in second generation alternative fuels, including biomass to liquid (BtL), gas to liquid (GtL), and cellulosic ethanol. Compared to current biofuels, the projected gains in efficiency when burning these second generation fuels are great, and up to 90 percent reduction in carbon dioxide emissions can be achieved when compared to traditional mineral fuels. The third generation of alternative fuel is hydrogen, and Mr. Geanacopoulos stressed that while hydrogen is abundant, major advances in technology will be required before use on any large scale is expected.

VW has also undertaken sustained efforts to increase the efficiency of their engines and develop engine technologies that will be compatible with new fuels in the future. In the short term, the company is excited about the DSG double clutch gearbox, which achieves great gains in efficiency by combining elements of both standard and automatic gearboxes. The company is also looking ahead to the hydrogen era in their research and development – VW has been involved in the development of a low temperature fuel cell vehicle and expects a prototype of a high temperature fuel cell vehicle, which is expected to be more suitable for large-scale production, as early as 2009.

Mr. Geanacapoulos concluded by calling for a broad approach to public policy in these areas. He warned that technology mandates do not work and urged regulators to focus on policies that create conditions for success. Specifically, he affirmed the need for a level playing field for technology options and said that consistency and stability of regulations is key. Harmonization of regulations across the Atlantic will help encourage alternative fuel development, particularly second generation biofuel development.

Mr. Bozzella then presented DaimlerChrysler's roadmap towards "Energy for the Future" (Annex 5). As global demand for petroleum continues to increase and supply becomes ever more constrained,

new sources of fuel will become increasingly necessary. The challenge will be heightened by the need to find fuels that can fulfill society's mobility needs while reducing greenhouse gas emissions.

DaimlerChrysler is carrying out strategies to meet these challenges with current technologies as well as developing new technologies for the future. In the short term, the company is optimizing combustion engines currently on the market and working to improve conventional fuels. In the medium term, alternative fuels will play a much greater role, while in the long term, hybrid cars and fuel cell technology will become much more viable.

Mr. Bozzella said that many of the lingering questions in the debate in Europe and the United States about fuel consumption and reliable sources of energy for transportation might be answered with one word – diesel. Advanced diesel technology is available today and can help reduce dependency on foreign oil. Diesel can improve fuel economy by an average of 30 percent and lower CO_2 emissions when compared to an equivalent gasoline engine. Yet, resistance to diesel persists in the United States. While two-thirds of all Chrysler Group vehicles sold in Europe are diesel, the market for diesel in the United States is small. Mr. Bozzella accounted for this trend by noting that in the past, diesel was a relatively dirty fuel, so when tailpipe emissions standards were imposed in the United States, diesel was effectively outlawed. In the intervening years, the technology has caught up, and although it is now cleaner than gasoline, diesel's reintroduction into the U.S. market has been difficult. DaimlerChrysler has high hopes for its *BLUETEC* diesel technology, which will be the cleanest and most fuel-efficient diesel in the world, capable of meeting emissions standards in all 50 U.S. states, including the new stringent standards in California.

Mr. Bozzella discussed the prospects for alternative fuels in the United States with the following scenario: *if* 20 percent of all diesel was biofuel, *and* all gas was E10 (ten percent ethanol blend), *and* 30 percent of vehicles were flex fuel vehicles capable of running on E85, then major gains in meeting the challenges he outlined could be made. One major infrastructural hurdle is that finding E85 at the pump is extremely difficult because of the costs associated with filling station conversion. As a solution, he said that the fines from CAFE standards violations that currently go into a general treasury fund should instead be used as direct subsidies to gas stations for the conversion to E85 capability.

In conclusion, Mr. Bozzella said that clear price signals are necessary to make consumers buy alternative vehicles. Two other elements that will be crucial for both Europe and the United States in the future, he said, are the movement from first to second generation biofuels and transatlantic harmonization of emissions and fuel standards.

Panel IV: Energy Security and Global Warming: Promoting Biofuels in the United States and Europe

Dr. Mark H. Thiemens, Dean of the Division of Physical Sciences at UCSD, moderated the fourth panel, which built on previous discussions by adding perspectives from policymakers. **Gregory Manuel**, Special Advisor on Energy Security to U.S. Secretary of State Condoleezza Rice, and **Reinhard Bütikofer**, Chairman of the German political party Alliance 90/The Greens, spoke about biofuels and energy security from a geo-strategic perspective.

In his opening remarks, Mr. Manuel said that the cost of ethanol production is decreasing radically and that the administration's goal is to double production in the next two years. This presents new opportunities, all of which must be considered in terms of their policy implications. Secretary Rice believes that energy is key in framing U.S. foreign and domestic policy and that it will take on an ever more important role in the future. The complexity of the energy picture requires us to be trilingual,

Manuel said; we need to be able to talk about energy differently in the science, technology, and business communities if we are to truly move the discussion forward.

Taking a global perspective, Mr. Manuel said that on the supply side, U.S. efforts should focus on increasing the production of both conventional and alternative fuel sources. On the demand side, it is important to effectively manage growing global energy needs. Seventy percent of demand comes from developing countries, particularly China and India. Nevertheless, the United States should also continue to closely follow developments in oil producing regions such as the Middle East, Russia, and South America.

Biofuels present a tremendous opportunity to build a "North-South" dialogue, Mr. Manuel said. For example, the band of countries that is within ten degrees latitude north and south of the equator relies heavily on oil, but they also have abundant rainfall and ample sun to make them prime growing regions for biofuels. In conclusion, Mr. Manuel said that Secretary Rice is looking to broaden the discussion about energy security and biofuels.

Mr. Bütikofer opened by saying that energy security and global warming are among the "hottest issues" in Brussels and other European capitals at the moment. The release of the Stern Review, by former World Bank economist Sir Nicholas Stern, for the first time cast the climate debate in stark economic terms. In addition, Russia's decision to sever energy supplies to parts of Europe twice within a twelve month period has forced Europeans to consider becoming more energy efficient. In this regard, there has been a push to promote biofuels. In the next fifteen years, they are the only direct substitute for oil in transportation, Mr. Bütikofer said. They will help reduce Europe's dependence on oil from the Middle East, Africa, and Russia, and they have the added benefit of lower greenhouse gas emissions. Most of these gains in the near term will be seen in traditional and second generation biofuels; while hydrogen has great potential, its development as a true alternative will take years.

Europe should set a clear goal, Mr. Bütikofer said, to be the most eco-efficient region in the world. In 2001, the European Commission brought forward its first biofuel legislative proposals, which were subsequently adopted in 2003. EU market share of biofuels was 0.3 percent in 2001 and only five member states had experience with biofuels. In 2005, biofuels were used in 15 of 18 EU member states, but the target of two percent of market share was not met by any of the member states except Germany (3.8 percent) and Sweden (2.2 percent).

Germany has concentrated on biodiesel from rape seed oil, which accounts for about eighty percent of biofuels in the country, while Sweden focused on bioethanol. In other respects, their policies have been similar: both countries have promoted high blends and have given biofuels tax exemptions. A 15 to 20 percent share of fuel consumption by 2020 is realistic, but prices for alternative fuels will have to come down. "With the probability of high oil prices, there is a good chance that biofuels will gather momentum." According to the European Commission's calculations, at a market share of 14 percent for biofuels in Europe, carbon dioxide emissions would be reduced by 99 million tons annually.

Not all biofuels are equally positive in regard to global warming, Mr. Bütikofer said. Bioethanol from Brazilian sugarcane, for example, is significantly cleaner than fuels produced from corn, rapeseed, or soy. He recognizes that there is a great deal of work still to be done and believes that the public sector must contribute by helping pay for innovation.

In conclusion, he looked ahead to the second generation of biofuels, noting that they will be extremely valuable. The United States and Europe each have useful experiences to share. "Let's call on the biofuel nations of the west to unite to defeat oil dependency and global warming."

Keynote Address: New Frontiers for Genomics: From Human Health and the Environment to Energy Production

At a dinner for conference participants and selected guests from the San Diego business and academic community at the Birch Aquarium at the Scripps Institute of Oceanography, UCSD Chancellor **Dr. Marye Anne Fox** set the stage by discussing the University's international work in a range of forward-looking areas. She then introduced the keynote speaker, **Dr. J. Craig Venter**, Founder, Chairman, and CEO of the J. Craig Venter Institute.

Dr. J. Craig Venter (left) and ACG President William M. Drozdiak at the Birch Aquarium at Scripps Institute of Oceanography

Dr. Venter began coding genes in 1995. At the time there was little to no federal funding available because no one thought it could be done. Since then over six million genes have been sequenced, including the smallest known genome (mycoplasma genitalium). This has led to tremendous breakthroughs in understanding and controlling disease, and it also has applications in many other areas.

Using his experience with genomics, Dr. Venter is developing new methods and technologies for alternative energies. His environmental genomics group is analyzing the data collected on his recent world-wide sailing expedition to collect samples from the farthest reaches of the earth, and he is now engaging in what he terms "transitional technologies." Such technologies use modified microorganisms to produce ethanol and hydrogen as alternative fuels. For example, he is trying to find ways to modify the process of photosynthesis to turn sunlight into hydrogen as one does corn into ethanol. He has also worked with coal because he sees it as second only to sunlight in potential. Furthermore, he has done groundbreaking research on turning algae into diesel fuel. In short, Dr. Venter describes his work as "synthesizing life."

Dr. Venter said he was pleased that the Bush Administration has accepted that climate change is happening, but lamented the fact that there is too little federal funding for research.

Policymaker Panel I: What are the Political and Economic Challenges Ahead?

Stefan Kornelius, Foreign Editor of the *Süddeutsche Zeitung*, moderated the first of two policymaker panels on the second day of the conference. The first panel brought perspectives from key foreign policy officials in Washington and Berlin and the second panel provided insights into U.S. federal and state positions.

As the first speaker on the first panel, **Dr. Markus Ederer**, Director of the Policy Planning Staff at the German Federal Foreign Office, provided a European perspective on how international affairs and new technologies dovetail. Energy security and climate change prevention are natural allies, because energy supply has become a power currency – as indicated by the energy power plays exercised by Russia vis-à-vis Ukraine and Belarus – and in the effort to be more independent, nation states must also focus on achieving greater energy efficiency and developing climate-friendly, alternative energy sources. On the other side of the same coin, climate change has also become widely recognized as a political and security issue. Dr. Ederer argued that a greater level of energy independence would provide increased security for consumers and for producers alike, but he recognized that some producers are nervous about the implications of energy independence.

In his remarks, Dr. Ederer also spoke about the general state of the transatlantic relationship. Despite an improved tenor in recent years, he does not think that the relationship has fully recovered from the dispute over how to handle Iraq. The Middle East, Kosovo, and Iran have underscored the importance of transatlantic cooperation, but these hotspots are treated in terms of crisis management and crisis prevention rather than as a forward-looking strategy. Promoting greater energy security is an area where greater transatlantic cooperation could be successful. The Kyoto Protocol hampered the relationship, but the United States and the EU can now take the lead in supporting energy efficiency and promoting biofuels and clean coal.

Deputy Assistant Secretary **Paul E. Simons**, of the Economics, Energy and Business Bureau at the U.S. Department of State, acknowledged that despite differences over Kyoto, U.S. and EU priorities are actually quite similar (Annex 6). Under the auspices of the International Energy Agency (IEA), both sides have agreed to long-term cooperation in energy diversification, energy economics, and in their analysis of energy efficiency and climate policy.

Global energy demand is likely to increase by fifty percent relatively soon, Mr. Simons said. Global oil demand will increase. As a result, CO_2 emissions will also increase. China is likely to overtake the United States as the world's largest emitter by 2010. Taken together, without policy shifts, the energy future is bleak. As major energy consumers, the United States and Europe must take the lead, particularly in efficiency. Each continent relies on different sources of power: The United States continues to depend on coal and nuclear power while the Europeans are moving away from coal toward natural gas. The prospects for nuclear power in Europe remain uncertain, as do those for renewables. The fear is that Europe will find itself increasingly dependent on foreign oil and gas. According to Mr. Simons, the Europeans may reconsider decommissioning nuclear reactors given current perceptions of energy dependency. The Stern Review on economics and climate change may help shape the debate, which should, Mr. Simons stressed, include a dialogue with the NGO community.

The IEA and the Bush Administration agree that a wide array of technologies is essential to provide a sustainable energy future. Domestic and international attention must be paid to carbon capture and storage, hydrogen, nuclear, and biofuels – while simultaneously promoting greater energy efficiency.

In the discussion, participants raised questions about Putin's Russia and the energy power games of the previous year. Dr. Ederer said that policy toward the post-Soviet space was high on Germany's agenda for its EU presidency during the first six months of the year. In response to Mr. Kornelius' inquiry about Iran, China, and energy, Mr. Simons said that in his capacity as Deputy Secretary of State Robert Zoellick had already launched a discussion of energy issues as they relate to Iran and China and wider international consequences. The U.S. considers actions by other states as well as general trends in supply and demand and keeps a close eye on countries that may try to destabilize the world system. Dr. Ederer said that Germany has also been following Iran's dealings with China (where a $100 billion gas deal was recently agreed), with Russia (a country with whom Iran has collaborated in nuclear technology), and India (with whom Iran recently secured a $70 billion gas deal).

In closing, both Dr. Ederer and Mr. Simons agreed that energy supply and energy security are firmly on the foreign policy agenda. Dr. Ederer said that Europe can learn from the United States. Many Europeans believed that the marketplace would regulate the energy market but were taken off guard by Russia's willingness to turn off gas supplies. Energy "is a cross cutting issue for foreign and security policy," he said. Mr. Simons agreed that energy security is firmly on the U.S. foreign policy agenda. The Russia-Ukraine gas crisis may not have had a global impact, but it sent a warning around the world that energy diversification is a pressing need.

Policymaker Panel II: Federal and State Approaches to Clean Energy and Climate Change

In the final panel, moderated by **William M. Drozdiak**, President of the American Council on Germany, participants gained insight into federal and state perspectives on clean energy and climate change. **John L. Geesman**, Commissioner of the California Energy Commission, provided a state perspective and **Dr. Harlan L. Watson,** Senior Climate Negotiator and Special Representative in the Bureau of Oceans and International Environmental and Scientific Affairs at the U.S. Department of State, gave a federal perspective.

By way of introduction, Mr. Geesman said that he had spent two five-year stints in state government, first working on the California Energy Commission and currently as one of its five Commissioners. The State of California is well on its way to double its renewable energy use and may even reach its ambitious 2010 energy objectives through increased gains in wind energy and biomass. By 2020, solar energy access will also be greatly increased. The State has focused on a mix of alternative energy sources and technologies, and has also been innovative in collaborating with petroleum firms. California has established its own air quality standards, which are more rigid than the federal standards. Mr. Geesman said that from a state perspective, the federal government should take the lead or get out of the way. A large and dynamic state like California can make significant strides in shaping policy.

Dr. Watson opened by saying that greenhouse gas emissions are a factor of population size and affluence as well as technology. Greenhouse gas emissions are thus measured vis-à-vis GDP, and for the State Department, U.S. emissions are discussed in terms of greenhouse gas "intensity" as they relate to the economy (Annex 7). Global demand is likely to grow in the next 10 to 20 years, Dr. Watson said, with coal use rising the most in absolute terms. This increased use of fossil fuels is likely to lead to increased CO_2 emissions (with half of the projected increase coming from new power stations, mainly using coal and mainly located in China and India.) Dr. Watson said that it is unreasonable to expect developing countries to reduce energy consumption (or emissions) for the foreseeable future.

In conclusion, Dr. Watson said that there is no silver bullet for reducing greenhouse gases. Instead, efforts should be made to increase fuel efficiency in all areas. The United States is working to slow the growth of greenhouse gases through a range of policies and measures, including tax incentives, and is investing in science and technology. In addition, the United States is working with other countries to meet the challenge of climate change.

"Biotech to Biofuels: How New Technologies Are Changing Transatlantic Relations"

Estancia La Jolla Hotel & Spa
January 11-13, 2007

Conference Agenda

Thursday, January 11

	Individual arrivals
As of 16:00	Conference registration
18:00	Reception (La Jolla Garden)
19:00	Opening dinner (La Jolla Ballroom A & B)
	Welcome: **Garrick Utley**, President, The Levin Institute, and Chairman, American Council on Germany
	The United States and the European Union: Trade and the Regulatory Challenges and the Global Economy
	Amb. Boyden Gray, U.S. Ambassador to the European Union

Friday, January 12 – Conference sessions will be held in the **Pacifica Ballroom**

(7:30 – 9:00	Breakfast in the Grande Room for conference participants staying at the Estancia La Jolla)
9:00 – 9:15	***Introduction: Framing the Issues*** **William M. Drozdiak**, President, American Council on Germany
9:00 - 10:30	Panel I: ***Biotechnology in America, Europe, and Asia: Diverse Cultural Perceptions and Misconceptions***
	Dr. Lee M. Silver, Professor of Molecular Biology and Public Policy at the Woodrow Wilson School of Public and International Affairs, Princeton University

Dr. Wilfried Prewo, Chief Executive, Hannover Chamber of Industry and Commerce (IHK)

Moderator: **Dr. Peter F. Cowhey**, Institute on Global Conflict and Cooperation, University of California at San Diego

10:30 - 11:00 Break

11:00 - 12:30 Panel II: ***The Future of the Pharmaceutical Industry: Who Pays for Innovation?***

Dr. Attila Molnar, President and CEO, Bayer Corporation

Dr. Lawrence S.B. Goldstein, Department of Cellular and Molecular Medicine, University of California at San Diego

Moderator: **Cornelia Stolze**, Freelance Science Writer

12:30 - 14:00 Lunch (La Jolla Ballroom A & B)

14:00 - 15:30 Panel III: ***New Cars, New Fuels? What are the Best Strategies for Reducing Oil Consumption? Can the United States Learn from Europe?***

David Geanacopoulos, Director of Industry-Government Relations, Volkswagen of America, Inc.

John Bozzella, Vice President Americas, DaimlerChrysler

Moderator: **Dr. Frieder Seible**, Dean of the Jacobs School of Engineering, University of California at San Diego

15:30 - 16:00 Break

16:00 - 17:30 Panel IV: ***Energy Security and Global Warming: Promoting Biofuels in the United States and Europe***

Gregory Manuel, Special Advisor on Energy Security to the U.S. Secretary of State Condoleezza Rice

Reinhard Bütikofer, Chairman, Alliance 90/The Greens

Moderator: **Dr. Mark H. Thiemens,** Dean of the Division of Physical Sciences, University of California at San Diego

18:15 Bus transfer to the Birch Aquarium at Scripps for reception and dinner

19:00 Reception

19:30 Dinner at the **Birch Aquarium at Scripps**
2300 Expedition Way, La Jolla, CA 92037

Welcome: **Dr. Marye Anne Fox**, Chancellor, University of California at San Diego

Keynote address: ***New Frontiers for Genomics: From Human Health and the Environment to Energy Production***

Dr. J. Craig Venter, Founder, Chairman, and Chief Executive Officer, J. Craig Venter Institute

Discussion moderated by: **Garrick Utley**, President, The Levin Institute, and Chairman, American Council on Germany

Saturday, January 13 – Conference sessions will be held in the **Pacifica Ballroom**

(7:30 – 9:00 Breakfast in the Grande Room for conference participants staying at the Estancia La Jolla)

9:00 - 10:30 Policy-Maker Panel I: ***What are the Political and Economic Challenges Ahead?***

Dr. Markus Ederer, Director, Policy Planning Staff, German Federal Foreign Office

Deputy Assistant Secretary **Paul E. Simons**, Economics, Energy and Business Bureau, U.S. Department of State

Moderator: **Stefan Kornelius**, Foreign Editor, *Süddeutsche Zeitung*

10:30 – 11:00 Break

11:00 – 12:30 Policy-Maker Panel II: ***Federal and State Approaches to Clean Energy and Climate Change***

John L. Geesman, Commissioner, California Energy Commission

Dr. Harlan L. Watson, Senior Climate Negotiator and Special Representative, Bureau of Oceans and International Environmental and Scientific Affairs, U.S. Department of State

Moderator: **William M. Drozdiak**, President, American Council on Germany

12:30 - 14:30 Informal Buffet Lunch (La Jolla Ballroom A & B)

Individual departures

"Biotech to Biofuels: How New Technologies are Changing Transatlantic Relations"

Estancia La Jolla Hotel & Spa
January 11-13, 2007

List of Participants

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