



U. S. Environmental Protection Agency
Region 4 Clean and Sustainable Energy Conference
December 11-12, 2007 Atlanta, Georgia

Meeting Minutes

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CLEAN AND SUSTAINABLE ENERGY CONFERENCE

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CLEAN AND SUSTAINABLE ENERGY CONFERENCE

EXECUTIVE SUMMARY

The U.S. Environmental Protection Agency (EPA) Region 4 convened the Clean and Sustainable Energy Conference: A Dialogue on Clean Energy in the Southeast, December 11-12, 2007, in Atlanta, Georgia.

The conference explored clean and sustainable energy efforts in the Southeastern United States, from policies to available technologies, to case studies of implementation. A primary conference goal was to initiate a dialogue among key stakeholders in the environmental and energy arenas, to help promote clean, affordable, and sustainable energy options across the region.

The two-day meeting convened over 130 participants, representing state and federal governments, academia, utilities, energy sector industry, non-governmental organizations, and interested individuals. The forum presented thought-provoking discussions of policies, programs, technologies and experiences throughout the two days. A half-day breakout session allowed for a more in-depth conversation by the participants on five key questions posed by the conference organizers. The questions generated positive and enlightening feedback from the conferees as they reported their findings on topics such as the economics of clean energy, regulatory barriers, and existing and proven technologies. Participants also agreed on the need for a continued regional dialogue on clean and sustainable energy among environment and energy sectors.

MEETING SUMMARY

The meeting consisted of five plenary sessions, including an opening and conclusion along with three substantive sessions: efforts underway to promote clean and sustainable energy at the federal and state levels, potential clean and sustainable energy technologies for the Southeast, and case studies in clean and sustainable energy options implementation. “The hope is,” stated Mr. Palmer, EPA Region 4 Administrator, “that this conference will bring to light the issues that need to be faced and inspire thoughts and actions that will bring expedient progress.” Upon conclusion of the conference there was a general sense that this expectation was met and that a dialogue was begun to promote real progress to increase clean and sustainable energy in the Southeastern marketplace.

MEETING REPORT

INTRODUCTION

EPA Regional Administrator Jimmy Palmer opened the conference by challenging the participants to consider the many opportunities available to reduce energy consumption through both small and large efforts. He pointed out the many stressors in the region, an area that comprises eight states (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee) in the southeastern portion of the country. These stressors include a doubling of the population from 1960 to 2000, which has led to rapid land conversion, automobile and commercial pollution, and increased waste disposal needs. These and other stressors negatively affect clean water, fresh air, and fish and wildlife habitats. Transportation is a central concern in the region where 600 trillion miles are traveled every year, releasing toxic fumes and hydrocarbons into the air. Mr. Palmer also noted that building standards in the region are insufficient, allowing for costly energy losses.

While the problems are complex, actions and alternatives exist. The Regional Administrator highlighted goals of the conference: on one hand to identify and communicate the complex environmental challenges facing the region while, on the other hand, sharing information on experiences, technologies and resources to reduce energy consumption and pollution. Such wide-scale questions about focus and action are particularly relevant in light of the region's current water crisis, "The hope is," stated Mr. Palmer, "that this conference will bring to light the issues that need to be faced and inspire thoughts and actions that will bring expedient progress."

The Regional Administrator highlighted EPA actions that serve as a model for broader efforts. For example, the regional office is working to enhance its use of “green power” and continues to strengthen its relationship with the Energy Star program. The Region is also investing in awareness building and education. Educating the population on the amount of money that can be saved just by changing to compact fluorescent light bulbs and properly insulating houses can save \$600 million nationally, Mr. Palmer stated. The Regional Administrator highlighted progress and research in the Region, such as the University of Georgia’s work on converting poultry litter to bio-oil. But, he contended, the research is not reaching the right audience and not getting to the marketplace quickly enough. Communication between academia and end-users needs to be strengthened so that research and results can address needs. “Given the challenges being faced, we cannot afford any more delays,” he stated, thereby challenging the conference participants to share, learn and act.

SESSION I: OVERVIEW OF CLEAN AND SUSTAINABLE ENERGY EFFORTS

Tom Kilgore, Chief Executive Officer of the Tennessee Valley Authority, chaired the first panel, an Overview of Clean and Sustainable Energy Efforts at the National and Regional Levels. Three panelists represented federal and state government, and non-governmental organization perspectives. Before introducing the panelists, Mr. Kilgore offered some interesting reflections from the Tennessee Valley Authority, an institute with a long history of harnessing the Tennessee River for power. Given the current drought in the region, the Authority has looked beyond hydropower to methane use and purchase of private wind and solar power. Mr. Kilgore pointed out the need for legislative support and incentives to expand energy technologies and reduce waste.

The first panelist, **Julie Rosenberg, Chief of the EPA Clean Energy and Environmental Partnership Program**, discussed EPA's clean and sustainable energy efforts. She contended that the convergence of several environmental, resource, and economic issues make this an important time for progress on clean energy. For example, there is a heightened understanding of the economic advantages that clean power and energy provides. There is strong state and local government interest in clean energy policies to help greenhouse gas reductions. Also, the EPA Administrator has set clean energy as one of his priorities for the coming year, reflecting its value in helping to limit emissions of greenhouse gases, reduce water usage, and enhance quality of life, as well as benefits to the utility systems and increased job potential. Ms. Rosenberg explained how EPA's voluntary programs are designed to overcome market and policy barriers by demonstrating the cost effectiveness of available technology. A relatively new effort she discussed is the National Action Plan for Energy Efficiency which aims to create a sustainable and aggressive national commitment to energy efficiency through gas and electric utilities, utility regulators, and other partner organizations. Ms. Rosenberg listed opportunities for continued clean and sustainable energy promotion.

The second panelist, **Ken Nemeth, is the Executive Director of the Southern States Energy Board**, a non-profit interstate compact organization created under public law in 1960, consisting of 16 states and 2 territories. The Board's mission is to enhance economic development and the quality of life in the South through innovations in energy and environmental policies, programs and technologies. Each jurisdiction is represented by the governor and a legislator from the House and Senate. Mr. Nemeth presented a stark picture of the future for traditional energy consumption, given current regional, national and international statistics. While petroleum production will peak then decline, global oil demand continues to grow. Volatility of oil production and supply, along with commensurate price increases, will lead to greater social economic injustices, both locally and internationally. This, along with increasing vulnerabilities due to disasters and terrorism, challenge uninterrupted supply of petroleum sources at a time when domestic natural gas production is volatile and experiencing rampant price increases. "We absolutely need more efficiency and conservation," summarized Mr. Nemeth. He pressed for alternative fuel sources and maintained that biomass fuels from agriculture and forest sources are the natural solution for the Southeast. At the same time, he pointed out the need for collaboration and communication among players in the field of alternative energy. He pointed out that, with a long-term perspective, energy and environment were mutually beneficial and that, if the country wants to maintain its status in the world, we must make energy conservation and efficiency a top priority. Mr. Nemeth noted "It is time for energy producers, suppliers, demand side managers and the environmental community to work together toward a strong energy future. To keep pace with the expanding world community and economic growth among nations, our country will need all energy sources and technologically efficient solutions. We must pay particular attention to the reserve margins of our electric utilities to ensure that reasonable and adequate power exists in a stable and effective energy grid system."

The third panelist was **Dennis Creech, Executive Director of the Southface Energy Institute**, which is a non-governmental non-profit organization that promotes sustainable homes, workplaces and communities through education, research, advocacy and technical assistance.. Mr. Creech considered the current situation of drought and energy costs in the region a “perfect storm of opportunity” for alternative energy sources. He pointed out that while the United States leads the world in energy consumption per capita, we also boast the lowest utility costs in the world – a situation that is clearly not sustainable. Mr. Creech outlined a pathway for change that consisted of educating the public and policy-makers, supporting research in alternative fuels, making energy policies that make sense, and offering technical assistance to convert to renewable and alternative energy sources. He attempted to dispel myths about solar and other alternative energies. For example, it is widely believed there is insufficient sunshine in Georgia to support solar energy, when in fact there is an abundance of solar resources in the region. He also highlighted other states and countries that have even lower solar resources that are requiring use of solar energy and succeeding. Mr. Creech encouraged the audience to educate policymakers on the need for energy efficiency and renewable energy.

A discussion followed the panel with questions about alternative fuels and need for information sharing. The panel pointed out various clean and sustainable energy sources and niche markets in the southeast for biomass and solar sources. The many tools offered by federal government, calls for regulatory incentives, and strong interest of state and federal government point to potential for changes that promote clean and sustainable energies in the Southeast.

SESSION II: CLEAN AND SUSTAINABLE TECHNOLOGIES FOR THE SOUTHEAST

The second session was designed to introduce a variety of clean and sustainable energy technologies potentially useful in the Southeast. This discussion comprised the main portion of the first day of the conference agenda. Several presenters identified existing technologies and successful roll outs of the technologies, as well as opportunities for continued research. The session Chair was **Ben Taube, Executive Director of the Southeast Energy Efficiency Alliance**, which is a non-governmental non-profit organization designed to achieve energy efficiency through networking across economic sectors, supporting activities and promoting education. Mr. Taube listed issues he hoped to cover in this session, which were: finding opportunities for alternative energy technologies, offering regulatory incentives, changing building codes and standards to require energy efficiency and the use of renewable energy sources, offering tax incentives and promoting the benefits to the public of using clean and sustainable energy.

Bob Hawsey, Director of Energy Efficiency and Renewable Energy Programs at the Department of Energy's Oak Ridge National Laboratory, gave an overview of clean and sustainable energy technologies that are currently available or in research phases. He pointed out the huge opportunities for action and investment in the region, as well as the need for dramatic improvement. Research conducted by Oak Ridge spans energy options such as biomass fuels, transportation and industrial technologies, cleaner coal, building and solar technologies, and hydro-power. Mr. Hawsey noted research advances for each of these technologies, as well as the unique position the region is in to advance them. Biomass fuel, for example, is particularly suitable to the region that hosts millions of agricultural acres. Crop residues, perennial crops, forest and urban residues, and millions of acres of switch grass can generate biofuels that

could ultimately displace a portion of petroleum use. While coal-fired power plants will only gradually phase out, cleaner coal burning technologies are already available that will reduce carbon dioxide emissions. Mr. Hawsey pointed out technologies to enhance the efficiency and continuity of solar power. He also mentioned opportunities for hydro-power and wind-hydro integration that offer expanded areas for research and development.

Bob Richards, of Southern Research Institute's Advanced Energy and Transportation Technologies group (Southern Research), presented a simplified view of potential greenhouse gas (GHG) reduction technologies. While power generation and transportation are responsible for about 2/3 of the GHG emissions in this country, significant reductions are possible. It is extremely important, however, that system performance and GHG emissions be rigorously, credibly, and independently verified. Southern Research has performed more than 35 independent verifications of systems which claim varying GHG reductions under the auspices of the EPA Environmental Technology Verification (ETV) program. Mr. Richards discussed:

- ground source heat pump for domestic hot water
- molten carbonate fuel cell combined heat and power (CHP)
- biogas-fired reciprocating engine CHP
- microturbine CHP
- petroleum industry vapor recovery system

Southern Research and others are also investigating power plant CO₂ capture and sequestration (CCS) and pure oxygen furnace (oxy-firing) technologies. Linked technologies which integrate a mix of biomass, solid waste, coal, CCS, gasification, power generation, and gas cleanup processes can produce electricity, liquid transportation fuels, chemical feedstocks, and district heat or cooling. These "polygen"

processes can have a neutral GHG “footprint” if properly designed. Performance and GHG emissions must, again, be rigorously and credibly evaluated. Pilot plant design and performance verification projects are underway at Southern Research’s carbon - to - liquids (C2L) development center in Durham, NC. Information is available at <http://www.southernresearch.org/environmental/carbon-to-liquids.html>.

Michael Slanders represented the U.S. Department of Energy’s (DOE) Office of Fossil Energy and discussed emerging clean coal technologies. He pointed out that over two-thirds of the country’s domestic electricity is generated using fossil fuels, with half of our electricity coming from coal. With electricity sales expected to rise by 41% domestically over the next 25 years and exploding economies in China and India, the world’s energy demand is dramatically increasing. In fact, electric power generation is expected to nearly double in the next 25 years. DOE’s goal therefore is to develop new technologies, such as clean coal, that can meet, and exceed, growing environmental constraints. In addition, advancing carbon capture and storage technologies is a key component of DOE’s efforts to pursue clean coal technologies that both meet energy needs and reduce greenhouse gas emissions. Mr. Slanders outlined several emerging clean coal technologies like Integrated Gasification and Combined Cycle (IGCC), advanced coal combustion such as Ultra-supercritical (USC) and Oxy-fuel, and carbon sequestration. Mr. Slanders also touched on DOE funded projects that support cleaner technologies such as several new partnerships designed to test and verify carbon sequestration technologies, and projects within the Clean Coal Power Initiative (CCPI). He summarized by saying that coal will continue to play a large role in domestic and worldwide power generation and that clean coal technologies offer the potential for coal power production with near-zero emissions and limited environmental impact.

Vikram Sami is the Chair of the Georgia Solar Energy Association, which is a chapter of the American Solar Energy Society, a non-profit organization. Mr. Sami introduced solar technology and its viability in the Southeast, stating that this was a growing field, possibly increasing ten-fold and expected to displace a considerable portion of traditional energy sources over the next 50 years. Mr. Sami highlighted the pivotal roll that building industry played in conversion to alternative fuels. 76% of electricity in the country is consumed in buildings, with a significant amount lost or wasted. While the largest share of building energy consumption goes to heating, lighting and water heating, over three-fourths of such energy demands can be provided by solar energy, both through passive solar (allowing the heat of the sun to directly impact a building), and photovoltaics (the process that converts solar energy into electricity). Mr. Sami also remarked that some solar energy is cost efficient; for example, a single family investment breaks even after 5 years of using solar hot water in the home, not accounting for any tax breaks or other incentives. Yet, because of the low cost of traditional energy and lack of incentives that support solar investment, the technology has not entered the market in a strong way in the region. Mr. Sami maintained that solar energy is feasible, cost effective and available to the Southeast. With changes to building codes and development of incentive systems, solar energy is a viable alternative energy source for the region.

Stan Thompson of the Mooresville/South Iredell Economic Development Corporation discussed using hydrail—hydrogen fuel cells used to fuel railway traffic. Hydrail is the generic term of art for electric railway traction-powered by on-board hydrogen fuel cells. Sixteen countries around the world are investing in hydrail projects, primarily driven by pollution concerns, fuel sources and maintenance cost of current rail technology. Several countries are leading the way, with US developing a prototype switching locomotive, Canada developing two hydrail commuter projects, Japan already testing two models and several other countries also planning hydrail for environmental reasons—especially climate change. The primary impediment to widespread

understanding and thus demand for hydrail is lack of media awareness and understanding of the topic. Mr. Thompson therefore suggests that government action highlight media events, media education, and leveraging the message of hydrail through media outlets. "What you don't know can hurt the planet . . . a lot!" concluded Mr. Thompson.

Dr. Lou Circeo is a Principal Research Scientist at the Georgia Institute of Technology who presented on the topic of Plasma Arc Gasification of Municipal Solid Waste (MSW). Put simply, "plasma" is ionized gas at high temperature capable of conducting electrical current, a natural example being lightning. Dr. Circeo maintained that municipal solid waste was an ideal source of energy, as it would both reduce disposal concerns and develop energy from an existing source. He summarized that plasma processing of municipal solid waste in the country could address environmental concerns of solid waste disposal while helping to alleviate the energy crisis. In fact, he stated that plasma processing of solid waste has the potential to supply 5% of the country's electricity needs. This is equivalent to the amount of electricity produced from 25 nuclear power plants. In another comparison, the energy created from plasma processing of municipal solid waste can create more renewable energy than the projected energy from solar, wind, landfill gas, and geothermal energies combined. A 3,000 ton per day MSW plasma processing plant is currently planned for St. Lucie County, Florida, that will produce approximately 120 megawatts of electricity to the grid. This could power 98,000 households, with byproducts of steam to be sold to local industry and the rock-like vitrified residue to be sold as construction aggregate. This project would also eliminate the county landfill in an estimated 18 years. Dr. Circeo maintains that such investment in plasma arc gasification of municipal solid waste is a win-win to the environment and energy sectors.

Dr. Tom Adams of the University of Georgia focused his presentation on an overview of available biomass and biofuel production and use, stating there are many natural resources in the southeast that make biofuels a viable alternative. Dr. Adams has worked with the Faculty of Engineering Outreach Service at the University of Georgia and cooperated with the Georgia Institute of Technology and the state's Department of Natural Resources in an organization called the Georgia Environmental Partnership. Dr. Adams described a number of biofuels for consideration by the conferees.

- Biogas production, while currently under-utilized in the United States, is an old technology from the mid-20th century. In the U.S. biogas methane, produced from sewage sludge in wastewater treatment plant anaerobic digesters, extracted from MSW landfills and from farm operations is used to generate electricity. The benefits derived from biogas include local energy production and clean, carbon-neutral fuel. Europe uses biogas to power mass transportation systems and automobiles.
- Biomass fuels from trees, such as Loblolly and Yellow Pine, are excellent resources for fuels in the Southeast, as there are more forests than crop land in the region. Some biomass sources are pulpwood, undergrowth in forests, limbs/leaves/some grasses, and crop residues. Technology exists to harvest "understory" which is undergrowth in forested areas. There is technology to develop pellets from biomass that efficiently generate 1) combined heat and power for industries and institutions and 2) heat, cooling and hot water for homes, business and industry. Hybrid biomass-solar systems are also being used in western states, in Europe and should be used in the Southeast.
- Chicken fat and yellow grease (used cooking oil) is another biofuel resource. In the Southeast, with its large poultry production, there are hundreds of millions of gallons of chicken fat produced every year.

Dr. Adams maintained that the highest and best use for biomass is for the production of transportation biofuels (oxygenates and green diesel) and not for electricity although at less than electric utility scale (<50 MW electric) biomass combined heat and power plants are economic. Dr. Adams suggested that wind power, generated in the West and the Midwest, is currently the best source for renewable electricity for the Southeast. He pointed out that Florida Power and Light is the nation's largest wind power generator, having wind farms in Texas and California.

Dr. Adams concluded that biomass from forest understory is the biomass resource in the region receiving the most attention at this time. He highlighted research underway using biocharcoal, a co-product of thermochemical biomass processing in biofuel production. It appears that this biochar, when used as a carbon sequestering soil amendment that partially replaces any needed chemical fertilizer, is an ecological catalyst, increasing the rate of growth of soil microorganisms, increasing the mass transfer of carbon dioxide from the atmosphere to the soil and the rate of carbon fixation in the soil.

Dr. Alex Hobbs, Associate Director of the North Carolina Solar Center at North Carolina State University talked about the sustainability aspects of converting agriculture waste to energy, with a focus on energy production from poultry litter and hog manure. He began by pointing out that the Southeast was behind the rest of the country in adopting renewable and energy efficiency solutions, partly due to relatively inexpensive energy based on operating a fleet of older coal plants. He predicted that, as fossil fuel and nuclear energy costs rise, energy efficiency will be a less expensive alternative to adding new power plants and noted that already the traditional energy costs are rising while wind, solar and renewable costs are coming down. Dr. Hobbs highlighted four drivers for renewable energy and energy efficiency in the region: a strong agricultural community, need for jobs in the region, air quality and climate change concerns, and the need for energy security and independence. He highlighted animal waste as a good source of renewable energy. Not only can use of animal waste create

energy, it also prevents methane gas from releasing into the environment, reducing overall greenhouse gas effects. Dr. Hobbs pointed out that the fundamental problem of converting animal waste to energy was that the farmers were focused on animal care, not energy development. They would need to invest in technology and personnel to operate a power plant on site. Yet, Dr. Hobbs maintained, there is tremendous opportunity for economic growth in developing renewable and energy efficiency resources in the southeast.

A discussion followed the sessions on clean and sustainable technologies, with several questions posed to presenters about the specifics of various technologies, the terms “renewable” versus “recycled” sources of energy, and questions around the technologies ready for investment. Based on the discussions, it is evident that, in general, experts and policy officials within the region are still at an information collection stage and remain fairly far from making long-term, specific commitments on alternative fuels. There is a growing consensus that something needs to be done to wean the region off traditional sources of energy and move the population toward conservation efforts. Education, promoting awareness, and continued research seem to be the most agreed upon areas for action, along with a need to reduce greenhouse gas emissions and take part in a national and global strategy to combat climate change. There was discussion about specific state regulations, with some touted as far-reaching, others insufficient, and several in need of enforcement mechanisms.

The day concluded with a preview of a film by Jeff Barrie, *Kilowatt Ours*. This film won Southern Appalachian Best Environmental Film award. The producer offered a short presentation of the film and stayed to answer questions.

SESSION III: PROMOTING CLEAN AND SUSTAINABLE ENERGY – CASE STUDIES

Dr. Lynette Cardoch, of the engineering consulting group MWH, (formerly Montgomery, Watson, Harza), chaired the session and began by acknowledging the importance of the EPA meeting and how much she appreciated the opportunity to participate. She noted that dialogue is very important to bring together policy makers, scientists, and end-users. The importance of various technologies to address the energy problem in the Southeast was crucial, as no single technology was the sole answer for the region. This final session would attempt to consider permitting, practical applications and partnership building.

Bryan Collins, Chief of the Energy and Transportation Branch in the Mississippi Department of Environmental Quality, presented a state's experience in permitting an ethanol production plant. Due to several factors, including a new state law that offered incentives, the 2002 Farm Bill, and Commodities Credit Corporation incentives, several new applications for ethanol production plants were submitted in 2002. The state had no previous experience permitting an ethanol plant, given there were no existing ethanol plants at that time. The Mississippi Department of Environmental Quality (MDEQ) is organized to process environmental permit applications for industrial activity in a multimedia fashion, ensuring that all regulated media is considered prior to issuing any environmental permits. The state sought input from other states and regions resulting in some technical guidance to assist in the permit process.

Subsequently, an excellent EPA Region 7 guidance document was published and should be particularly helpful. The document, Environmental Laws Applicable to the Construction and Operation of Ethanol Plants, can be located at:

http://www.epa.gov/region07/priorities/agriculture/ethanol_plants_manual.pdf

Considerations in the Mississippi permitting process were: the Clean Water Act, NPDES effluent and storm water guidelines, pretreatment effluent guidelines, and state requirements on discharge permits. There was also a conservative approach to air emissions used in the process. In the end, nine sites were permitted, but none have completed construction to date. Lessons learned include a need for collaboration from EPA, states, and other sources on permitting ethanol production plants.

Clark Wiedetz, General Manager for Alternative Energy of Siemens Building Technologies discussed practical applications of landfill gas as an alternative energy source. Historically, key concerns of landfill gas use have been the perception of odor, gas leakage, or even explosions. These perceptions have proven to be unfounded. Now, with the 300% increase of natural gas prices, carbon trading incentives to businesses, and a need to reduce greenhouse gas emissions, landfill gas usage is rampantly increasing. EPA has been a strong leader in promoting landfill gas technology, primarily through its outreach and education program. Since landfill gas is about ½ methane and ½ carbon dioxide, with small amounts of trace gases and elements, landfills are not only a source of energy (i.e., methane combustion) but also reduce greenhouse gas emissions. To date there are about 437 projects in the country that use landfill gases for energy production and, according to EPA, methane emissions have been reduced by 24 million metric tons of carbon equivalent. The gas is used in one of three ways; either directly to burn and create steam or heat, generating electricity, or compressed and injected into natural gas pipelines. Mr. Wiedetz pointed out that DeKalb County, Georgia, had just initialized a pipeline injection project, a first of its kind so far in the State of Georgia. Landfill gas projects are expanding, with 50 additional projects expected to become operational across the country in the next two years. Economic incentives are found not only in avoiding increased traditional energy prices but also in trading carbon credits through an exchange network and taking advantage of a variety of tax incentives available to investors. "These projects are great

projects and we're saving the planet one landfill gas project at a time," concluded Mr. Wiedetz.

Bob Leker, of the North Carolina State Energy Department, whose department's mission revolves around energy efficiency, renewable energy, and energy emergency issues, stated that energy alternatives were real and hinged upon finding, exploring and developing a sustainable energy resource plan. Renewable resource planning must incorporate energy efficiency and they must be sustainable. Speaking about his home state, Mr. Leker pointed out that North Carolina was the 23rd largest emitter of greenhouse gases in the country and that population growth was a major stressor on the energy sector. He linked health status from air pollution, global warming and water usage to energy, and noted that the state legislature was very active in the energy area, with more than 45 energy bills in play during the last legislative session. Important to North Carolina is that there is no sources of conventional fuel in North Carolina : oil, natural gas and coal are brought into the state for an annual purchase price of \$15 million every year. The State has formed a North Carolina Energy Policy Council that has listed priority actions and linked them to funding. At the state government level, a utility energy savings initiative is underway, training 3000 state and university employees to become energy advocates, and resulting at least \$66 million savings to date from energy conservation. In addition, new high performance buildings are in place with 30% greater energy efficiency, several sustainable resource features and lower energy costs. The state vehicle fleet is integrating non-petroleum use in vehicles, with 75% of the new state fleets comprised of alternative fuel vehicles. In the state's coastal and mountain regions, solar and wind energy are being considered as resources. In summary, the state is taking energy conservation and alternative energy sources seriously. They have implemented changes in government buildings and taken actions to promote awareness regarding the use of sustainable, alternative energy sources from within the state borders.

Kevin Kelly of the Georgia Environmental Facilities Authority, Division of Energy Resources discussed the role of partnerships in promoting clean energy in the State of Georgia. Both population and economic growth have steadily increased demand for fuel, transportation, electricity and water in Georgia, posing environmental challenges for the state. For instance, the state continues to grapple with air quality standards such as the ground-level ozone and particulate matter standards. The state energy office and the state Environmental Protection Division of Georgia have, over the last ten years, developed a strong working partnership that has supported clean energy development in the state. Given the current drought situation that covers two-thirds of the state, there are new opportunities to also focus on the relationship between energy and water.

Partly as a response to Hurricanes Katrina and Rita, which impacted the state's energy supply, a new State Energy Strategy for Georgia was submitted to the Governor in December 2006. Not only did this reduce regulatory barriers to bio-energy sources, it also laid the groundwork for multi-sector involvement in conservation, energy efficiency and renewable energy sources. A multi-stakeholder effort is due to get underway in 2008.

Several climate related efforts also stemmed from the Strategy. One area for opportunity in conjunction with the strategy is a "one-stop shop" for permits and legal requirements to incentivize bio-energy developers. More than a dozen state and federal agencies have pooled efforts in a commitment to offer help to bio-energy developers, which has resulted in close to \$500 million investment in bio-energy development in Georgia over the past year. A research center in Georgia has also recently opened its "Bio-fuels Commercialization Center" at the Herty Advanced Materials Development Center in Savannah to develop ethanol production techniques. This, combined with efforts underway at the Georgia Institute of Technology and the University of Georgia, offers a wealth of technical resources as incentives to prospective bio-fuel developers in the region.

The session concluded with a general discussion on the various technologies that had been shared throughout the day. Mostly, there were a variety of questions targeted to specific presenters focused on scientific, engineering or other technical aspects of the presentations. Trends in conversations revolved around using data to choose among alternative technologies, cost and other issues related to feasibility of certain technologies, and definitions of terms, such as what are renewable versus non-renewable resources. There was a short discussion on building up incentives to bring new technologies to market and then, over time, decreasing the support to the point where the technology is independently sustainable.

SESSION IV: BREAKOUT SESSIONS

Conference participants were divided into four smaller groups to discuss the same five questions developed by the conference planners. The four groups reconvened in plenary and shared discussion outcomes, ideas and insights. The following summarizes the plenary session responses to the five questions and reflects input from the four groups, as well as ensuing discussions.

1. What are some of the economic issues surrounding clean and sustainable energy in the Southeast and how can they be addressed?

Economic issues surrounding clean and sustainable energy in the Southeast reflect inertia on the part of government, the general public and the energy sector. There is generally a lack of incentives, a minimal interest in renewable energy, and little market for alternative energy sources. New technologies find it hard to compete with traditional energy markets, even when cost-savings to individuals, governments, industry and the environment are evident. The utilities have little incentive to make changes and, in fact, have been historically supported by state and federal policies. For example, the utilities make profits based on the amount of energy produced, a disincentive for energy conservation. Beyond the utilities, builders and developers will pursue the lowest cost building options by building only to state and local standards. Building codes that do not require energy efficiency or use of renewable resources or newer codes that lack enforcement will perpetuate energy inefficiencies.

There is political motivation, however, to change the structure of the energy sector. Several states in the region import all traditional fuels, sending millions of dollars out of the state every year to support their energy consumption. Additionally, there is a potential for job generation and an increased tax base by investing in alternative fuels within the individual states and the region as a whole. Individuals and the public at large

may benefit from alternative sources as traditional energy prices continue dramatic increases.

Fiscal incentives can be used to promote clean and sustainable energy. For example, tax breaks for investment in renewable energy or tax increases on traditional energy sources can reduce barriers to entry of alternative fuels. Holding utility rates down has questionable value in the long-run, especially if the policy is not sustainable. In fact, keeping traditional utility rates suppressed makes it hard for alternative sources to compete. "Cheap is not sustainable," stated one group that pointed out how low utility costs fail to recognize the real costs of energy, including environmental and other issues.

Several ideas were shared on how to address economic issues. There is need for state-level leadership in identifying priorities, legislating changes, and setting fiscal incentives that incorporate costs of traditional utilities and incentivize alternative energy sources. These policies should incorporate life cycle costs and benefits, align with federal incentives and be compatible across the region. Financing for alternative fuels research and implementation was suggested, including supporting demonstration projects, assisting with venture capital formation and providing technical assistance, such as business planning. Finally, public outreach and education was recommended, to further engage the public.

2. What are the most pressing regulatory barriers to clean and sustainable energy build-up in the Southeast and how might we overcome those barriers?

There are many regulatory barriers to clean and sustainable energy sources entering the regional utility markets. Permit processes are designed around traditional utilities and do not always work for alternative sources. Several types of permits are needed for utilities markets, for example, and there is no clear guidance or coordination on the part of states and federal government to facilitate permitting. In addition, there is a bias in the permitting scheme against certain alternate approaches, such as combined heat

and power. There are also laws against third-party electricity suppliers, lack of finalized regulations (e.g. federal wind regulations), and renewable energy facilities are not in most permit codes. Public utility commissions tend to favor traditional utilities, making it harder for alternative sources to enter the market. Building codes do not require alternative energy or energy efficiency. Local community covenants even obscure the way, with rules against windmills, for example, in local neighborhoods.

Suggestions were made to overcome barriers, such as promoting coordinated, long-range planning for State and local offices to offer comprehensive planning among regulatory agencies. There is a need for renewable portfolio standards at state and federal levels. Decoupling strategies for utilities was mentioned, as was work needed in state legislatures to create a public benefits fund that could promote alternative energies. Accounting for the cost of health impacts related to traditional utilities and reflecting those costs into utility rates was suggested. Education for the public and for regulators was suggested, as well. Two guidance documents from EPA were recommended: a Guide to Action for states www.epa.gov/cleanenergy/state/local, and the National Action Plan for Energy development. Another suggestion was the creation of competitive renewable energy zones to spread the risk for renewable energy infrastructure.

3. What clean and sustainable energy production technologies are ready for rollout, and what can be done to encourage commercialization (from laboratory scale to market place) of technologies?

- Biomass Fuels, including:
 - Use of biomass in coal-fired boilers
 - Use of wood waste as fuel
 - Use of grease/fat

- Anaerobic digestion of biomass
- Biofuels from biomass (e.g., biodiesel, ethanol)
- Capture and reuse of used oils
- Animal manure
- Agricultural feedstocks and byproducts
- Solar Energy
- Gasification Technologies
- Landfill Gas Capture
- WindPlug-in hybrid electric vehicle
- Hydrogen
- Hydrokinetic
- Efficiency, green buildings
- Combined heat and power

While many technologies are proven and ready for rollout, much effort is needed to bring these to market. Largely, education and behavior changes are needed, in the utility sector, among regulators and policy officials, among builders and developers and in the general public. There is a need to create markets to support the technologies, and in some cases, such as wind, solar and biodiesel, infrastructure investment is required. State and federal governments can provide incentives to businesses and states that are using, producing, and promoting energy efficiency and clean and sustainable energy. Utility round-tables give utilities a comfort level as they hold discussions in or out of the region with other utilities researching renewable energy. Retrofitting of existing structures for renewable energy technologies can help, along with adequate training of

staff for implementation and maintenance of the technologies. Uniform permitting between states is needed, as well as incentives or guarantees for bank or other financing for new technologies. The government can help reduce risk and liability surrounding implementation of new technologies. Finally, good communication on successes and promotion of technologies that work is needed.

4. What actions are needed to promote clean and sustainable energy solutions in the SE by various stakeholders such as: state legislators, Congress, environmental groups, corporations, the public and your organization?

In general and across sectors, leadership to promote clean and sustainable energy is needed. Dialogue among sectors and entities must continue, along with standard and goal-setting. Education and awareness is needed in every sector, with an emphasis given to improving mass media understanding. Most of the sector-specific actions suggested were directed to state governments of the group of states that make up the region. For example, there were suggestions to make government buildings responsible to pay their own energy bills to internalize the costs of energy. States should create incentives, goals, and mandates. One group maintained that all states in the Southeast needed renewable energy and fuel standards. Others suggested a regional greenhouse gas management plan and creation of a carbon market for the region. At the state level, policies could couple renewable economic development energy projects with new jobs. Education of both state and federal politicians was deemed necessary for increased understanding leading to better legislation. Both state and federal government should work to develop common measurements, such as defining biomass, landfill gas, and animal waste measurements, along with setting measurable goals or mandates. Specific to the federal government was a suggestion to amend the Clean Air Act to include global warming as a mandated area. Environmental groups needed to increase advocacy for clean and sustainable energy, including increased awareness and education, also promoting green power. Both environmental groups and utilities needed to work together to build understanding and alliances between the groups. Corporations

were encouraged to engage with the public sector, set industry-wide goals for conversion to renewable energy (e.g., vehicle fleets), become an active stakeholder in energy policy development, share best practices with others, and work with environmental groups to overcome barriers.

5. Would a continuing conversation among Region 4 energy and environmental stakeholders be helpful to promote clean and sustainable energy sources in the Southeast? If yes, what form of discussion would be most useful?

The short answer to this question from the plenary session and across the breakout groups was, “Yes.” There was a broad-based support for continued discussion among all stakeholders on clean and sustainable energy in the Southeast.

The recommended form of discussion recommended varied, but there was a general suggestion to identify the purpose of the continued dialogue, such as gathering resources, exchanging information, holding an economic forum or looking for solutions from other states. Forms of consortium varied from the suggestion to develop parallel tracks on energy and environment, increase dialogue between energy and environmental stakeholders, develop state sub-committees, and post a website on what the states are doing. Some other suggestions were to invite EPA to the Southeast energy directors meeting, present state energy strategies and include them on the EPA Region 4 website, increase education and information sharing among states, and create a collaborative statement on energy policy for the Southeast. A state-utility dialogue was deemed important, and there was support for focusing on state legislators and legislation.

Session Conclusion

Paul Sloan, Deputy Commissioner of the Tennessee Department of Environment and Conservation, concluded the final session stating, “We need to identify very specifically how we as a region, must move from conversation to implementation as quickly as possible and in the context of the region.” He noted that every state was making progress on clean and sustainable energy and a goal for the region was to “connect those lights,” essentially connecting the states and their actions with a unified response to an urgent need for action.

SESSION V: SUMMARY AND CONCLUSION

Regional Administrator Jimmy Palmer offered closing remarks, noting the importance of states in the Region working together so that clean and sustainable energy opportunities overcome barriers to gaining a market share. A dialogue among the eight states will lead to increased collaboration, with EPA Region 4 facilitating discussions and providing technical assistance, as needed. He reminded the conferees that electric power users in Region 4 account for 25% of the nation's coal consumption, while very little of the electricity is coming from renewable sources. State and federal government agencies and other stakeholders can help address challenges and issues, working together to remove roadblocks. He pointed out that more dialogue with politicians was needed, including the empowerment of a political champion. Mr. Palmer thanked the presenters and the audience for their work to achieve the important outcomes of the conference.