



Workshop of the Latin American Sustainable Energy Policy Initiative (SEPI)

Minutes of the Workshop

**March 5-6, 2007
Mandalay Bay Resort and Casino
Silk F Meeting Room – Third Floor
Las Vegas, United States**

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Renewable Energy Policy Overview:

Michael Eckhart, President, American Council on Renewable Energy (ACORE)

Michael Eckhart is one of the many founders of ACORE. He has over 25 years of experience in energy, power generation, high technology, and renewable energy. He has held management positions as the CEO of United Power Systems, Inc., Vice President of Arete Ventures, Inc., Manager of strategic planning for the Power Systems Sector of the General Electric Company, and Principal of Booz, Allen & Hamilton, Inc. Mr. Eckhart is a member of the Chairmen's Committee of the World Council for Renewable Energy (WCRE).

A group of very influential people in America helped build ACORE. The Board of Directors consists of corporations, non-profit organizations, and leaders of the renewable energy industry. Membership in ACORE includes renewable energy industries, associations, utilities, end-users, professional service firms, financial institutions, non-profit groups, universities and other educational organizations, as well as government agencies. ACORE serves as a forum through which these parties work together on common interests. ACORE is a non-profit NGO that brings together all of the organizations needed to make renewable energy successful in America. ACORE is the industry, education, end-users, professional services such as lawyers, Wall Street, financial institutions, non-profit organizations, government associations, and so on, all working together. ACORE has over 400 members. These members are not just individual people, but organizations such as Goldman Sachs, Merrill Lynch, etc.

The Power Gen Energy and Fuels (PGRE&F) trade show is the only full trade show in renewable energy in the United States that gathers all the technologies in one convention exhibit. In March 2007, there were about 180 companies exhibiting. In the first year there were only 40. The event offered a good feeling of all the technologies in one place. There were seven conferences going in parallel in speaking sessions.

ACORE also convenes a conference on Wall Street. This is a very large conference about financing which takes place in June 2007. Speakers for this conference are all CEOs of companies and heads of banking and investment firms. ACORE also organized a policy conference in Washington DC in November 2006. ACORE works with the United States Government to organize this conference, discussing how to make renewable energy policies better in the United States.

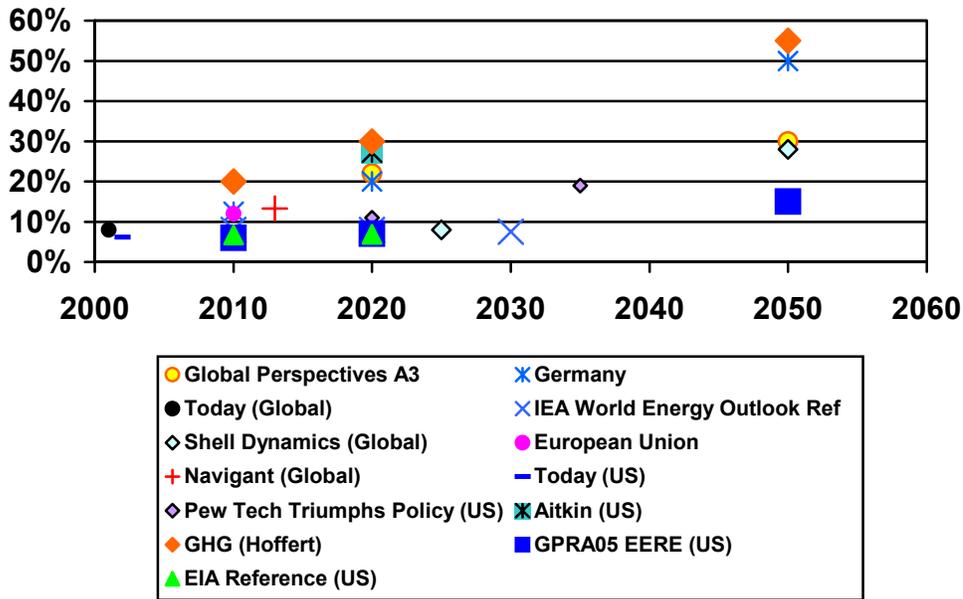
Lastly, ACORE asked the United States government to host a world meeting on renewable energy. The first world meeting on renewable energy was the International Conference for Renewable Energies Bonn 2004. Later on there was a follow up meeting, the Beijing International Renewable Energy Conference (BIREC) 2005. ACORE has asked the United States government to host meeting number three, which will be held in Washington DC in March 2008. ACORE is raising the funds for the conference. If this conference takes place, the next PGRE&F event will take place as a co-located event, on

the second floor would be the government meeting, on the first floor would be the side event, and the basement would host the convention itself.

Renewable Energy in the United States

This is a diagram showing different studies about how much would be renewable energy by when.

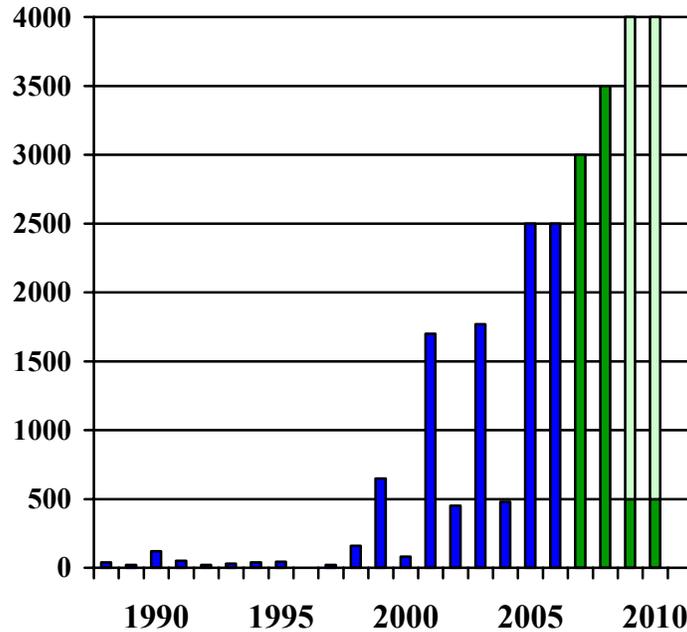
Renewable Energy Targets and Forecasts % of Total Energy



What the United States government estimate intends to show with this computer modeling is that, without any major change in policy, renewable energy is not going to grow too much. On the other hand, the climate change community does not say that the United States *will* reach a renewable energy share of 50% but that it must do that much in order to save the planet. The job of ACORE is to match the two. In other words, ACORE works on getting the blue line to go to the orange line. How can we do that? At the Policy Conference “Phase II of Renewable Energy in America” convened by ACORE on November 30, 2006 in Washington, DC, all the trade associations and NGOs that are powerful in renewable energy were asked to give the same presentation about what is the outlook on renewable energy, what is the vision, where is all this going. In order to get the message through there were 16 speeches, all of which basically described the same issues. ACORE packed those speeches into a book.

Wholesale Power Generation: United States Wind Power

Chart 2: United States Wind Power Installations (MW/Year)



11,900 MW Installed Base end 2006

Market Drivers:

- . Production Tax Credit - ?
- . Renewable Portfolio Standards
- . Transmission
- . China

350,000 MW within 20-30 years

The blue lines in chart 2 above represent how much wind power generation has been installed in the United States between 1990 and 2005. The fluctuations on the period 2000-2005 are due to a production tax credit created by the United States Senate that was only good for two years. The Congress kept letting this tax credit expire. However, it takes about two years of work to properly develop a wind farm. As a consequence, before the tax credit would expire, every two years companies would stop working. When the tax credit was renewed by the Congress, the work would restart. This happened for about five or six years. (See chart above). This shows the importance of long term stability of policy measures that provide incentives to renewable energy projects and initiatives. This market behavior affecting the United States market place resulted in the wind turbine companies *not* building factories in the United States. Mr. Eckhart further emphasizes that, in his opinion, this chart represents a lost opportunity of about 25,000 jobs that could have been created in the United States. Although the major purpose of Congress is to create jobs, in this case, it missed an opportunity to create new ones. The renewable

energy industry must demand fair and reasonable treatment from Congress so that it provides incentives in a way that creates good economic results. This production tax credit has now been extended one more year. It is now good for two more years going forward. However, if the tax credit is not extended, activities will drop again. So there is no clear prediction about what will happen in the future. This tax credit must be extended for another five to ten years.

The wind energy installed base in the United States totals 11,900 MW. In contrast, in Mexico's La Venta, in the Yucatan Peninsula, there is an installed capacity of 2,600 MW in one location only. This shows the monumental impact of both policy reforms and extension of the electric grid in enabling the La Venta project. The outlook on wind power in the United States is of 350,000 MW of installed capacity within 20-30 years. This represents one third of all the electric power generated in the United States in 2007. In terms of energy consumption projections, some specialists predict that the electric load is going to grow. Others think that, through efficiency, electricity generation will remain flat. This would mean that coal-fired plants would be progressively eliminated.

There are over 200 investors on utilities centered around cities in the United States which generate as much as one billion dollars or more in revenues per year. In March 2007 there was a big fight with one of them: the Texas Utility Company (TXU), a utility located in Dallas. The general idea was that Wall Street would buy the company, make it private and drive it towards greater efficiency and renewable energy. The deal was brokered by Environmental Defense, an environmental group who wanted to stop the utility from building coal-fired power plants and instead build wind farms. Environmental Defense helped negotiate environmental terms of the buyout deal that the Texas Pacific Group and Kohlberg Kravis Roberts & Company made with TXU, including concessions to reduce coal-fired plants and carbon emissions limits. The environmental group used Wall Street tactics to negotiate the environmental concessions. However, some groups favoring renewable energy criticized the deal. According to some sources, in 2006 TXU wanted to build three coal-fired power plants. One of the members of the Board of Directors of TXU insisted on having support from an environmental group. The management thought: "how do we get support from environmental groups to build coal-fired power plants?" They had an idea: "we'll propose to build 12 coal fired plants and let the environmental groups beat us back to three in the negotiation."

There are over 100 newly proposed coal-fired power plants in the United States as of 2007. There are also projects for 31 nuclear plants. The United States Energy Policy Act of 2005 includes a provision for six long guarantees for nuclear power plants. In this context, if the renewable energy sector does not keep growing, it will lose its position in the industry. What ACORE is trying to do is to make renewable energy win in the market place. To that effect ACORE wants to be economically positive. Therefore ACORE is working on figuring out how many jobs will be created by building wind farms. ACORE wants that number to be higher than it would be by building nuclear- or coal-fired power plants. The outlook must be positive. The issue is not just to have more wind farms, but also to have the jobs and the economic values that come with that.

Chart 3: Other Wholesale Power Generation



Geothermal Power:

3,000 MW in development
100,000 MW mid-term future



Hydropower:

23,000 MW incremental hydro
90,000 MW total "water power"



Biomass Power:

Industrial CHP: 57 GW
Wholesale power: 37 GW
Solid Waste: 10 GW

In addition to wind the United States has geothermal, hydro power and biomass with a lot of potential. There is only an installed capacity of 3,000 MW of geothermal power. However, an extra 100,000 MW can be built really quickly. According to Mr. Eckhart, geothermal power is very important in Latin America and the Pacific Rim. There is a lot of geothermal potential in Mexico and the whole western coast. In Mr. Eckhart's professional opinion, geothermal power is being overlooked. There are two kinds of renewable energies: sunlight and heat coming from the center of the earth. Those are the only two sources of renewable energy. Wind and hydro power are derivatives of sunlight. It is a well established fact that there is enough energy in the earth's core to power up society. But the engineering challenge of getting down there and getting that energy out is so big that nobody has taken on the job. The biggest engineering challenge of all times is being shied away and not tackled. It is hard for people to imagine how to do this, very difficult and expensive, but it has to be done.

Other Wholesale Power Generation: Concentrating Solar Power



Solar Trough:

64 MW Under Construction
1,000+ MW Proposed

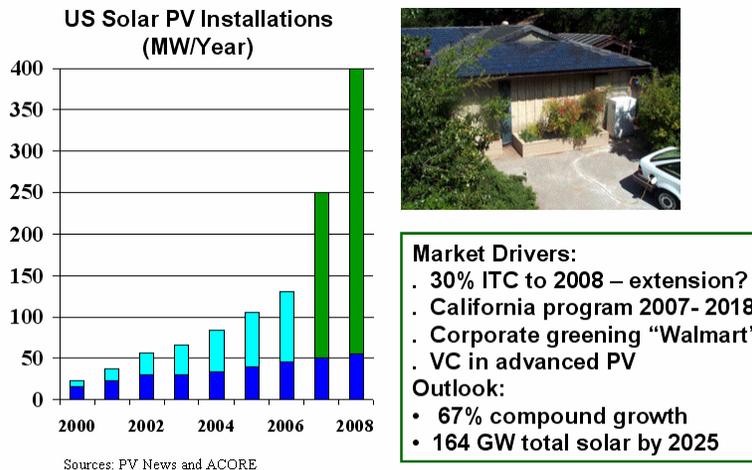


Solar Dish-Stirling:

850 MW Contracts
500 MW Letter of Intent

Concentrating solar power is coming back. The solar plates shown on the picture above left are located in California. Each of these mirrors is about 1,000 square feet. The solar dish-sterling shown on the picture above right is being proposed. It has been widely promoted but still isn't fully proven. In the case of the solar plates plant, the thing that has been worked on the hardest and is still unsolved is how to have a reliable low-cost method of washing the mirrors. This is just a practical issue; it is not about great technologic advances. It is barely about making things work in a practical low cost way.

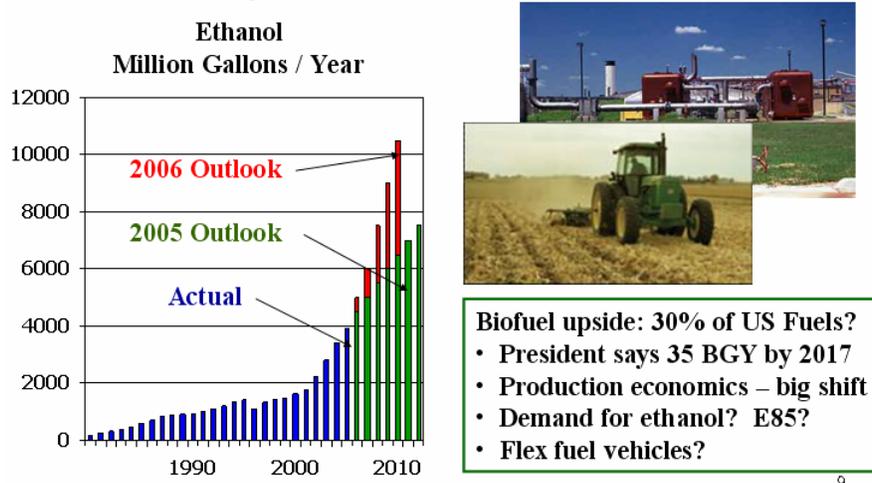
Chart 4: Distributed Generation – US Solar PV Market



In the United States there is data on how many photovoltaic installations are produced in factories. However there is no data on how many of these are installed domestically. Mr. Eckhart estimates that in 2007 the number of installed solar PVs doubled. In 2006, 125 MW were installed. In 2007 this number reaches 250 MW. The reason for this tremendous growth in 2007 is mainly that California has a subsidy program for solar which is very powerful. Therefore, most of the market growth is in California. At the federal level, there is a 30% investment tax credit in solar energy nationally. This is not a tax deduction but a tax credit. What this means basically is that, if a solar system costs 1,000 dollars, the United States government gives the buyer of the system 300 dollars. In California there is an additional subsidy. Both the federal and state governments are sufficient to cover about one half of the cost of the solar system. In addition there are large corporations such as Wal-Mart, thinking about how to look environmentally friendly. If a corporation wants to look green, what can it do? It installs PV panels on its sloppy roofs so everybody can see them. It is a very powerful effect of corporate thinking, because these corporations buy a lot and very quickly. This combination of federal incentives, state incentives and corporate people thinking leadership is a good example of the tax incentives to push the market and the demand incentives to create the consumer awareness in demand.

Chart 5: Biofuels

Ethanol = 109 Plants + 40 new projects in 19 States
Biodiesel = 85 plants + 65 in construction in 24 states



The chart above shows the ethanol production in billions of gallons per year. Actual production is displayed in blue. In 2005 the forecast displayed in green showed a big growth. However, this outlook changed dramatically in 2006. The new outlook for the next several years is much higher. Corn prices are up ethanol prices are down, and profits are gone. Mr. Eckhart thinks that prices will remain flat for a couple of years. There are 100 plants today and 40 new projects, half of which might not be built. There was an overheated situation and Wall Street is coming to a stand. This means big trouble for the ethanol business. In the last year the price of corn went from 2 dollars to 4.50 dollars a bushel. It more than doubled in 6 months. There was sort of a Wall Street bubble, an artificial boom. There was a sudden shock on the corn market. What we will see for the next few years is a market where the price of corn will remain flat. There will be trouble for a while until everything settles back in. It may take up to five years to stabilize the price of corn.

The US government program is promoting cellulosic ethanol made from wood chips and straw. The United States Department of Energy gave 385 million dollars in grants to six cellulosic ethanol projects to get commercial size plants built. This is the effect of the new US Department of Treasury Secretary Henry M. Paulson, who used to work at Goldman Sachs. He is close to President Bush, who wants to get biofuels going in America. If a nation wants to have cellulosic ethanol, it has to have to the plants built. In order to build the plants, that nation has to provide the money to do it. This idea sunk in the US government and it did it. It should be noted that. The US government does never take this line of action. It does not usually provide funding in this manner.

Chart 6: Outlook on Renewable Energy in America

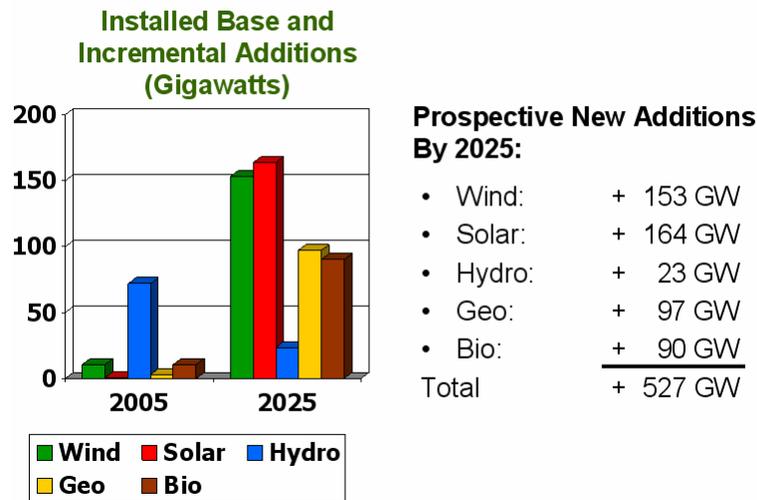


Chart 6 above shows a summary of the analysis that came from the Policy Conference “Phase II of Renewable Energy in America” convened by ACORE on November 30, 2006 in Washington, DC. It is expected that over the next 20 years, there will be an increase in renewable energy use. However, the US needs better public policies to make that happen.

In 1978 the United States passed the Powerplant and Industrial Fuel Use Act (FUA) in response to concerns over national energy security. The FUA restricted construction of power plants using oil or natural gas as a primary fuel and encouraged the use of coal, nuclear energy and other alternative fuels. It also restricted the industrial use of oil and natural gas in large boilers. In 1987, the sections of the FUA that restricted the use of natural gas by industrial users and electric utilities were repealed as a result of falling natural gas demand and prices. Natural gas and oil could again be used to fuel electric power plants, and restrictions on gas and oil-burning industrial boilers, turbines, and engines were lifted. Since then, these precious fuels are being used up in boilers where it is just burned. As a result of this public policy, the United States is actually running out of natural gas. In 2006, the United States physically produced 1% less natural gas than it did in 1990 with twice the numbers of wells. Returns are diminishing, and that is why President Bush brought in Samuel W. Bodman to be the Secretary of Energy. Mr. Bodman used to run an LNG company in Boston. If the US does not get LNG facilities built to import gas, it will run out of gas.

Why is the transition towards renewable energy so difficult?

It is the interests in fossil fuels that make these changes very difficult. As an example, in 2006 Exxon Mobil generated 39,500 billion dollars in net profits. Europe is the most advanced region of the world in terms of sustainability, climate change, and the environment. For example, in the Netherlands and the UK, companies such as Shell and BP are being responsive to the local population and government as a result of the business-government relationship. The way of thinking of the executives of these companies is being changed.

Will the US Congress pass carbon legislation?

According to some predictions, the US Congress will pass carbon legislation before the end of 2008. The utility industry is being pressured by Wall Street to get the business straight quickly. In order for this to happen the rules must be known by all. The utility industry and Wall Street do not want to build coal-fired power plants and then have carbon laws passed, thus making it a mistake. Wall Street investors do not want to lose money on this. Both the electric utilities and Wall Street investors are pressuring the Congress, asking it that, if it is going to enact carbon restriction laws, it should do it now. Both sectors want certainty before a coal-fired power plant is built. On the other hand, the utilities that want to build nuclear plants also want the rule because it benefits them, since these plants do not produce carbon emissions. As a matter of fact, the sooner the US Congress passes a Carbon law, the better it is for these power plants. Utilities owning old coal-fired plants are also in favor of Congress passing Carbon legislation. These power plants will have to be shut down because they will not be allowed to be operated for environmental reasons. By shutting down these old coal-fired plants, the utilities owning them will be paid billions of dollars in carbon credits.

It is expected that the new US carbon legislation will be shaped as a carbon cap-and-trade type of law similar to those enacted in Europe. Therefore, those who want to build nuclear power plants will have an advantage and those that are shutting down coal-fired power plants would be paid billions of dollars. And we have not yet spoken about the efficiency and renewable energy industries. They all see this advantage. These billions of dollars made by the utility companies from shutting down coal-fired power plants — which they would have been forced to shut anyway, only now they are getting paid for it— will provide them with enough equity to build new nuclear power plants.

The reason why the US Energy Policy Act of 2005 includes a provision for six loan guarantees for new nuclear power plants is that Wall Street is not willing to provide sufficient debt to build the plants and utility companies do not have enough equity funds to assume the costs. However, through this mechanism the utility companies will get the necessary funding to go into equity to keep the business going.

This should be thought of as a football game. In other words, you are better off if you know the play the other team is going to run. Then you can figure what to do. In this case, we know the play they are running; now we have to figure out what to do about that.

What kind of cooperation could be expected between Latin American countries and ACORE?

Latin American countries can get involved in ACORE's International Committee to start information exchange. ACORE is very active internationally and would welcome the opportunity to create some kind of initiative in the region; Judy Siegel is the Chair person of ACORE's International Committee.

Energy Efficiency Policy Overview:

John Geesman, Commissioner, California Energy Commission

John Geesman serves as Presiding Member of the Renewables Committee and the Facility Siting Committee at the California Energy Commission. Commissioner Geesman, of Orinda, California, rejoined the Commission after originally serving as its Executive Director from 1979 to 1983. From 1983 to 2002, he was an investment banker specializing in the debt markets. During this time, he served as Chairman of California Managed Risk Medical Insurance Board, Chairman of the Board of Governors of the California Power Exchange, and as a member of the Board of Governors of the Independent System Operator.

The California Energy Commission is the state's primary energy policy and planning agency. It was created by the Legislature in 1974, during the first oil crisis. The motivation for establishing the Energy Commission was the growth of nuclear power in California and the apprehension that it would have to place one nuclear plant every 10 miles along the California coastline to keep up with growing demand. In 1974, the California legislature gave the Energy Commission several overlapping, potentially conflicting responsibilities. It had to:

1. Oversee new power plants by issuing all of the environmental and public health and safety permits;
2. Develop the most rigorous energy efficiency standards in the world in order to reduce the demand for power plants;
3. Develop renewable sources of energy because no one liked the idea of new conventional power plants;
4. Conduct a research and development program; and
5. Develop an independent forecast of electricity demand and other energy trends because no one believed the utilities utility companies or the oil companies

Commissioner Geesman was the Executive Director of the Energy Commission in the 1970s, when there was a very bitter debate over nuclear power or the development of coal plants in California. The people of the State of California are very actively engaged in the energy debate and, as a consequence, the political sector has played a larger role in California energy policy than elsewhere in the United States.

Since 2003, California's electricity policy has been based on three premises:

1. An emphasis on energy efficiency;
2. An emphasis on renewable sources of energy; and
3. An emphasis on clean natural gas, to the extent that the first two are not sufficient.

This presentation focuses on California's energy efficiency policies.

Energy Efficiency Policies in the State of California

In the State of California, energy efficiency policies contemplate three basic components:

As the first component, the California Energy Commission established efficiency standards for all new constructions. New buildings—residential and non-residential—must comply with high efficiency standards. Every three years, the Energy Commission analyzes the state of the art in building design and sets an efficiency standard that will be cost-effective to the consumer over a long period of time. These standards add to the cost of buildings, but they pay for themselves over time in energy savings. By putting a dollar value on those savings, the Energy Commission discounts future savings at a social rate of 3% per year.

The second component deals with appliances in a similar way as the first component deals with buildings. The California Energy Commission (CEC) established an efficiency standard for new appliances that is cost-effective to the consumer over time. California was the first state to initiate appliance efficiency standards in 1974 with the adoption of the Warren-Alquist Act, which instructed the CEC to promulgate efficiency standards. The CEC has continued to upgrade these standards to remain consistent with new technologies. In 1975, the appliance manufacturers persuaded the United States Congress to adopt a similar legislation. If a federal standard had been adopted before California had passed its own standards, the State would have been preempted from adopting it. California moved very quickly in the 1970s to adopt these standards before the federal government could preempt it from doing so. In January 2007, the United States Government Accountability Office issued a report evaluating the federal government's appliance efficiency standards. According to this report “[the Department of Energy] DOE has missed all 34 congressional deadlines for setting energy efficiency standards for the 20 product categories with statutory deadlines that have passed. DOE's delays ranged from less than a year to 15 years.”¹ “Of the 34 rules with missed deadlines, 11 were issued late, and the other 23 have not been issued at all.”² This law has been on the books for 32 years. California and several of the other states sued the Federal Government. A settlement was reached between the two parties by which the Federal Government has promised to adopt its standards by 2011. In the meantime California is continuing to adopt efficiency standards for areas that the Federal Government has not yet preempted. You may have read about the efforts in the California Legislature to outlaw incandescent light bulbs. It is estimated that compact fluorescent light bulbs would save 75% of the energy consumed by an incandescent light bulbs and, over time, would be cost-effective to the consumer. This legislation is called the “how many legislators does it take to change the light bulb law”.

The third component of the program is utility-administered efficiency services. California's utilities are spending about 700 million dollars per year assisting their costumers in using energy more efficiently. The law in California requires the utilities to

¹ GAO-07-42 “Energy Efficiency: Long-standing Problems with DOE's Program for Setting Efficiency Standards Continue to Result in Forgone Energy Savings”, released March 1, 2007, at p. 5

² At *id.*

exhaust all economic sources of energy efficiency before they are allowed to invest in new supplies of conventional power plants.

- How does it become apparent to the Energy Commission that a company has exhausted all means to augment energy efficiency?

The Commission spends about 50 million dollars per year on measurement and evaluation of utility efficiency programs and to make a determination on what remaining economic opportunities exist for additional energy efficiency.

- Does the Energy Commission issue standards for efficiency in transportation?

California is not as advanced in the transportation sector as it is in the electricity sector. The Commission does not have as much regulatory control over the oil companies as it does over utility companies. The California Energy Commission has focused on fuel content requirements because the Federal Clean Air Policy allows California to set its own fuel content requirements. In 2006 the Governor of California issued an Executive Order to require all transportation fuels to reduce their carbon content by 10% by 2020. In the United States a number of other states adopted the California fuel standards. As a consequence, this is likely to affect more cars than just those in California.

In terms of transportation fuel consumption, in 2005 California adopted standards to reduce CO₂ emissions from automobiles. In the course of doing so, it required the efficiency of automobiles to improve by about 35%. The auto manufactures have sued the State of California, to prevent that rule from going into effect. California's requirement is that of a "clean air standard", but the auto manufacturers see it as a "mileage efficiency requirement" that only the federal government can regulate. The United States Supreme Court will decide the case in two steps. The first step will take place in the summer of 2007; the second step will take place next year.

- Who will win? The State of California or the auto manufacturers?

Commissioner Geesman thinks that the State of California will win the legal battle. The issue in front of the Supreme Court this year is whether CO₂ is considered an air pollutant under the Federal Clean Air Act. In the United States CO₂ is not officially registered as a pollutant. This is fundamental issue of this debate.

In April 2007, the United States Supreme Court ruled that the Environmental Protection Agency violated the Clean Air Act by declining to regulate new-vehicle emissions standards. (*Massachusetts, et al. v. Environmental Protection Agency*)

- What is the amount of electricity savings of the State of California?

In 2007 California had a load of about 60,000 MW. It is growing by about 1.5% per year if adjusted for the weather. It may be 5% in 2007 if there is a hot summer. It may be 0.5% in 2008 if there is a cold summer. But over a period of 10 years these increases average 1.5%. For the last 30 years the per capita consumption has remained flat as a result of the

State's efficiency standards. Elsewhere in the United States per capita consumption has grown by 50%. Efficiency makes a big difference.

- How is consensus built regarding energy policies?

The people of the State of California are very vociferous about environmental values. In the 1960s the State faced a similar debate over whether lead should be removed from gasoline. The use of lead in gasoline was prohibited and auto manufactures were required to put catalytic converters on vehicles tailpipes. This policy did not work very well for the first couple of years and there was a great deal of controversy. Nowadays this is not a controversial issue anymore. All around the world there has been efforts to reduce the lead content of gasoline. As a consequence, infant mortality has gone down, elderly health problems have gone down, etc. The people of California demand of its government that, when an environmental improvement is technologically feasible and economically viable, it forces the industry to adopt it. California does not have a lot of heavy industry. In a way, it is the public of California saying that it wants a certain kind of car.

- Does this way of building policy create a conflict with other States?

There are 12 other states in the United States that, characteristically, adopt the standards of the State of California. One week after California announced it would outlaw incandescent light bulbs, the state of New Jersey said it wanted to do the same thing. So did Australia, Venezuela and Cuba. There are similar conditions and similar publics elsewhere in the United States and around the world. It is the demand from the public which has caused the State of California to do what it did.

Commissioner Geesman thinks that Latin America does not yet show a level of engagement by the population to drive the kind of public policy that there is California. The question is how public officials can begin to mobilize the population on measures that are the right thing to do on energy in Latin America.

- Do we have the money to pay for more technologies in Latin America? Should we focus on efficiency?

Efficiency in many instances is not really much of an added cost or a technological advance. Over the course of 32 years since California started adapting its building standards, the new standards have not added much more than 1,000 dollars³ to the cost of a home. The average cost of a home in California is of about 450,000 dollars. Therefore, the new standards have not had a significant impact on the cost of housing. Furthermore, about two thirds of all Californians own their homes. Home ownership is pretty broadly distributed among the population.

³ Values adjusted to 2005.

Another factor that motivates much of the public's focus on efficiency first as a matter of policy is been extreme apprehension about the cost of fossil fuel electricity. California is about 45% dependent on natural gas-fired electricity.

- How can you tie energy efficiency to renewable resources?

The solar program is probably the best example. California subsidizes in combination with the federal government about half of the cost of the solar installations. However, before someone can qualify for this subsidy, the state requires that they improve their efficiency upon California's building standards by 15%. The state forces an increased investment in the efficiency of the building before the installation of a subsidized solar cell array on the roof top of a building. Simple economic logic drives to efficiency first, given that it is so much cheaper. California calls it efficiency, not conservation. The state is not trying to impose austerity or scarcity. California tries to improve the efficiency with which energy is used.

- Are solar PV panels made locally in California?

Most of the panels are manufactured either in Germany or Japan. China is increasingly becoming a factor in the market. Several of the companies have assembling facilities in California or Northern Baja where the arrays are actually assembled. However, the cells themselves are actually from Germany, Japan or China.

There is also a great deal of hope in the utility administered programs, which can start a job creation effort through efficiency in retrofitting existing buildings for modern day efficiency standards. The thought behind it is that this is a better use of the monthly payments that consumers make to the utilities in its job creation potential, than simply spending the money on purchases of fossil fuels.

- Does California provide incentives to efficient vehicles?

The federal government has had on and off for about five years, tax incentives for hybrid vehicles. The federal government designed a federal tax incentive which covers the additional cost associated with the purchase of a vehicle with hybrid technology. At the state level there is no tax incentive for those vehicles. What the State has done is to allow certain hybrid vehicles to qualify for carpool lanes with only a single driver. This is not a good policy in terms of the encouragement of carpooling or the reduction of congestion. However, this policy is extraordinarily popular. The State even ran out of stickers for hybrid vehicles to go into the carpool lanes. In the Washington DC area the HOV (High Occupancy Vehicles, or carpool lanes) provision has expired. The incentive period worked well, a lot of people bought hybrid vehicles. Now people are moving away from that and it has become a debate over congestion versus efficiency. Congestion levels in the Washington DC area are so high that, regardless of the efficiency of the vehicle, having only one person in it has become counterproductive. Here is an example of another counterproductive effect of the incentive: the California program will last until

2010. By that time, the stickers that allow hybrid vehicle owners to use the carpool lanes will be worth more than the older hybrid cars circulating in those lanes.

- Does California use tax incentives in dealing with oil companies?

The oil companies do not pay very much in oil taxes to the state government in California. Almost all of the taxes paid by the petroleum industry in California are *ad valorem* taxes based on the assessed value of real estate or personal property. These taxes are paid to local governments and not to the State government. The ability to use tax policies as incentives is pretty limited. This is one of the reasons why the State relies so heavily on regulatory policy in dealing with the oil companies.

- Issue of carbon restriction frameworks

Some states have their own carbon restricted framework. For instance, Oregon has enabled its industries to make investment in places like Peru in terms of carbon sequestration or offset and renewable power plants. Is California going down the same path?

This is under intense debate as of March 2007. The executive branch agencies of the State government are strongly inclined toward market mechanisms that would allow investments not only in other states in the United States but around the world as part of the cap-and-trade system. The legislative branch of government would prefer to confine those mitigation investments to inside the State itself. The California Air Resources Board (ARB) was directed to complete a review of the Low Carbon Fuel Standard protocols. The ARB will also begin a regulatory process in the summer of 2007 to implement the Low Carbon Fuel Standard to be completed no later than December 2008. It is expected that the mechanism will be somewhat similar to what the Europeans have done. California will have a certain percentage of allocations that can be achieved in investments outside the State.

- What are the key measures being implemented in the industrial sector?

Cogeneration in the industrial sector is the key measure that the California Energy Commission has not yet been successful in reviving since the 1980s. The Commission was very aggressive in applying the Federal Public Utility Regulatory Policy Act (PURPA). PURPA was passed in 1978, in the midst of the energy crisis, to reduce dependence on foreign oil, to promote alternative energy sources and energy efficiency, and to diversify the electric power industry. The CEC required California utilities to purchase electricity generated by industrial plants after avoided costs.

It was that volume of supply that kept the lights on in California in the 1980s and 1990s because the utilities were not allowed to build coal plants or nuclear plants. However, utilities hate cogeneration and have made it very difficult to expand it. In 2007 the CEC sponsored legislation to try to re-impose that obligation to purchase electricity generated

by industrial plants. The new legislation also seeks to go one step further and actually give the utilities supply targets that they have to achieve through cogeneration. The improvement in efficiency from combining a thermal load with an electric generating load can go as high as 70%. Quite commonly it reaches the 40% to 55% range. This is a policy which, from the industrial development standpoint, really ought to be encouraged. In December 2006 there was a fire in one of Puerto Rico's oil-fired generating stations. The only things that have kept the lights on in Puerto Rico are a couple of cogeneration projects at factories. The Chamber of Commerce of Puerto Rico was waking up to the fact that official policy for the last 10 years has been hostility towards cogeneration. Each of these projects has proposals made to the government to expand their capacity. Puerto Rico is probably going to do that. A key element in the industrial sector is encouraging and facilitating the self generation of electricity.

- Why is it that utilities do not favor cogeneration?

Competition. California's utilities are accustomed to be monopolies. They do not like any generation that is not their own generation. They consider that a threat. It takes a very consistently applied governmental policy to overcome this. California applied it for about 10 years and then put it aside. The State is now trying to reinstate that policy.

Biofuels Policy Overview:

Barbara Bramble, Senior Program Advisor of International Affairs, National Wildlife Federation

Mrs. Bramble co-founded the worldwide citizens' campaign to reform the environmental operations of the World Bank and similar institutions; developed the concept of debt for nature swaps; served on the organizing committee for the International NGO Forum at the Earth Summit in Rio in 1992; formed the Global Forest Policy Project; and developed the Forest Stewardship Council.

The National Wildlife Federation (NWF) is the largest conservation NGO in the United States. It has over four million members and supporters and was created in 1936. Energy policy is of vital importance to the National Wildlife Federation because it profoundly affects fish and wildlife. Recently NWF selected global warming and its many impacts on wildlife as its chief priority among its traditional priority of restoring wildlife habitats in the United States mostly, and also in other countries through policy ideas. NWF does not work on land conservation. Its activities differ from those of World Wildlife Fund or Nature Conservancy.

NWF has been promoting renewable energies which can both reduce greenhouse gases and be compatible with conservation of wildlife habitats. Biomass and bio energy can be one of the best sources for liquid fuels for transports depending on how these stocks are produced and how the technologies are used in the refineries. We are working very

closely with ACORE and particularly with the Biomass Coordinating Council (BCC) to promote policies which enhance the use of bio energy in the United States and other which meet these characteristics of reducing greenhouse gases and conserving habitats.

NWF inaugurated the BioEnergy WIKI in 2006. It typifies the kind of innovation that will help move BCC collaborative tasks forward—online, user-written, informative, and topical. The BioEnergy WIKI is a worldwide source on information on bio energy available at <http://www.bioenergywiki.net/>.

Biofuels have the potential to reduce carbon emissions, help solve global warming, and create economic opportunities for rural areas. Biofuels can be an important part of the energy mix of the future. But growing crops for biofuels can have negative impacts, including clearing forests for cropland, depleting and polluting soil and water resources, and reducing the amount of land available for food production. The issue of carbon sequestration ability of the biomass used to produce them should also be taken into account. If the biomass used has a low ability of carbon sequestration and it destroys the wildlife habitat, then it will emit more carbon dioxide than it sequesters.

There is currently no broadly accepted label or certification process available to assess the value chain of biofuels. NWF wants to avoid a conflict between conservationists and the biofuel industry. NWF's task is to solve these issues. It is proposing a form of certification with standards and criteria to identify the kind of energy that has the best effects at the global level. The process for its creation should be multi-stakeholder, involving public, private and NGO partners to lend legitimacy to the results and to ensure that the standard is accepted internationally. The standard should be generic, simple and apolitical.

The Energy Center at the Swiss Federal Technical Institute in Lausanne (EPFL) is coordinating a multi-stakeholder effort, the Roundtable on Sustainable Biofuels, to develop international standards for sustainable biofuels production and processing. By early 2008, it aims to have draft standards developed in conjunction with non-governmental organizations, companies, governments and inter-governmental groups from all over the world. The objective is to create a tool that consumers, policy-makers, companies, banks, and other actors can use to ensure that biofuels deliver on their promise of sustainability.

There is important work already going on in sustainable biofuels standards development. The aim of the Roundtable on Sustainable Biofuels is to build on this work and create standards that are:

Simple: The standards should be accessible by small producers, inexpensive to measure, and easy to explain.

Generic: The standards should be applicable to any crop in any country, and allow comparisons across crops and production systems.

Adaptable: The standards should be easy to revise to take into account new technologies and their impacts on relative performance of different biofuels.

Efficient: To incorporate other standards and certifications to eliminate duplicative reporting and reduce inspection burdens on producers and processors.

All standards development work will be done in an open and transparent way, with ample comment periods. The BioEnergy wiki (<http://www.bioenergywiki.net>) and other on-line tools will be used to allow broad and open feedback. Interested parties may get involved in this process. For more information, please visit http://www.bioenergywiki.net/index.php/Roundtable_on_Sustainable_Biofuels or <http://EnergyCenter.epfl.ch/Biofuels>.

William Holmberg Chairman, Biomass Coordinating Council

Biomass includes ethanol and bio based products. The important thing to really appreciate about biomass is its enormous potential to heal the problems in any society where there is land, water and sunshine. For example in the United States about 80% of the solar equipment—photovoltaic cells, thermal cells or thermal systems, and wind machines—are build overseas. In the case of biomass, fuel power and bio based products, 100% is built, grown and used in the United States. Generally biomass is a domestic industry that is very valuable to the people and has to be used adequately for the sake of the environment. There are several examples of why biomass is so important domestically.

The embargo has been a tool of American administrations since the early 1970s, when embargoes and sales moratoria were imposed on grain and soybeans for both political and economic reasons. In 1980 former President Carter put an embargo on the exportation of grains to the former USSR. The reason for the embargo was the former USSR's invasion of Afghanistan in support of that country's pro-Soviet government. This embargo had a tremendously damaging impact on the grain growers in the United States, particularly on corn growers. The market was greatly reduced and corn growers were going broke. They got on their tractors and trucks, drove all the way across country and had a huge tractor, trailer and truck cavalcade to the nation's capital. Since then, the economic impacts of embargoes on US farmers, the cost to the nation's taxpayers, direct export loss and effect on target countries have stirred up controversy. The partial US embargo on agricultural sales to the former USSR, lasted from January 4 1980 until April 24, 1981.

As a result of these and other crises, several groups started to lobby for the creation the ethanol industry. Critical legislation was passed in 1979, and every step of the way it has been a combination of the people in the communities—mostly the farmers and later on

the environmental community, coming to the rescue of the ethanol industry. It was the people and the Congress that kept this industry going.

Both cases show how critical it is to ensure the inclusion and full participation of the people in the process of building the biomass industry. That is where the political strength of the process will be. A similar story can be told about biodiesel. That story started in 1990, and once again it was the people that lead the way, picking up the political strength in order to influence the Congress, change the mind of the President etc. It is always the people that make a big difference. The states also followed with their own regulation incentives.

Jack Werner – Renewable Energy Toolkits for Local Governments

Mr. Warner works with the Climate Institute. He assists state and municipal governments and community organizations in the United States on renewable energy technology and policy activities that help start what is called the sustainable community program nationally. Solar and biomass renewable energies are the areas where he works the most with the community, helping them to understand the technology, and looking at the finance mechanisms and how to put a finance package together for bringing renewable energy into their community.

The two ways this is usually done is by either putting together a “workshop in a box” or a “tool kit”. Those are ways of putting together information materials and tools that the community, local and municipal government leaders, or State government leaders need to be able to understand how to bring renewable energy technology into their operations. This is particularly important when trying to bring renewable energy into the municipal and State governments.

The toolkit is meant to train the trainers so that a municipal leader—a Mayor, someone in the local or the county government, or the county commissioner—and their staff learn how to use this toolkit to be able to talk to their constituents about the technology and what they want to do. A local, community organization can also get this tool kit. It will learn how to use it in order to talk with others and train them in terms of the technologies. In biomass a toolkit was developed to train municipal and state governments and even the federal government on what is available in terms of bio based products. It includes specific references to inks, materials for building, lubricants, other bio based products and also biofuels that governments are able to use in their every day operations. As local governments start to learn how to use these different products, the toolkit guides them on the type of financing that is available to purchase these products and integrate them into their daily activities in their governments. A package of information was put together about financing tools that are available at the federal, state and local government levels to bring these technologies into government operations.

The federal government provides grants, loans and financing programs for the state and local governments. The state government also can create its own financing program in

terms of grants, loans and other kinds of mechanisms. The Municipal governments can also use taxpayer monies to finance these projects. Therefore, there are three levels of financing in the government.

Carol Werner – How to Work with the Congress and the Environmental Community on Biofuel Policies

Executive Director, Environmental and Energy Study Institute (EESI)

Ms. Werner has more than 20 years of public policy experience on energy and environmental issues. She is recognized nationally as one of the finest environmentalists in the country and has been working with the Congress since 1978. The EESI has a lot of influence over other environmentalist organizations in the country.

EESI is a non-profit organization dedicated to promoting environmentally sustainable societies. Meeting this goal requires transitions to social and economic patterns that sustain people, the environment and the natural resources. EESI produces information and public policy initiatives that lead to these transitions.

EESI was founded in 1984 by a congressional caucus, a bipartisan group of Members of Congress, concerned about energy and environmental issues. That congressional caucus was formed in the mid 1970s. These members of Congress were from both the House of Representatives and the Senate. They felt that it was very important to have an organization which could provide good information to them to develop innovative solutions to energy and environmental problems facing the country.

EESI's mission is to work for environmentally sustainable development. Economic development and environmental protection go hand in hand, both are important in order to achieve stability and success. Development and environment are not a threat to each other, but instead are very complementary to each other. EESI works in several ways; it views education as being very critical. To provide education, one of the things EESI does is to hold more than 25 congressional briefings a year on science, technology and policy issues coming before the Congress or on issues that we think should be coming before the Congress.

EESI's work is developed in three mayor program areas: energy and climate, transportation and smart growth, and agriculture and renewable energy. In addition to using the congressional briefing as a way to help inform policy makers, EESI also publishes three electronic newsletters that go to congressional offices as well many other interested people in the policy community. EESI also works in coalitions. A mayor part of what it does on policy is to develop networks so that one coalition participates in other existing coalitions. If an organization is truly going to try and built consensus to create innovative solutions to energy and environmental problems, it is very important that it works with people from different sectors and with different perspectives.

In 2007 for example, the Farm Bill is before the Congress; it comes up for reauthorization every five years. It is an area in which EESI is working very closely with many organizations and businesses because it will be setting a number of policies connected to agriculture and energy. Members from both parties, and in both the House of Representatives and the Senate, feel very strongly that this particular Farm Bill should have a much greater emphasis on renewable energy. There is much interest in the Congress with regard to biofuel and how US farms can really produce much more energy.

As we have watched efforts in states take place with regard to biomass, biofuels, and bio products, what has been critical in each case is that changes have really occurred because of new policies that have come through state legislatures, strong leadership from governors, NGOs and the private sector working together. The key point that should be made is that NGOs can be a very important in terms of bringing together a variety of different kinds of organizations as well as providing very important education for policy makers so that they understand issues better and what different policy solutions may look like. Such organizations can be a mayor asset in making changes to move biomass forward. In the Congress there also is a Congressional Caucus in the House of Representatives and the Senate, called the Renewable Energy and Energy Efficiency Caucus. It was launched in February 1996. This is a bipartisan group of members of Congress concerned about renewable energy and energy efficiency. These Representatives formed their own group.

Although ESSI was founded by the Congress, it is not funded by the government. ESSI is a non-profit NGO funded by private foundations, individuals and various companies. ESSI is also part of Earth Share. Earth Share partners with hundreds of corporate, federal and public workplaces across the country to support environmental programs and initiatives. Earth Share's workplace campaigns help establish a workplace as an environmental leader. Therefore, ESSI is funded by many different sources.

In terms of standards for renewable energy, in the United States, The Energy Policy Act of 2005 amended the Clean Air Act to establish a Renewable Fuels Standard (RFS) program. A renewable fuel is defined in the Energy Policy Act as a motor vehicle fuel that is produced from plant or animal products or wastes, as opposed to fossil fuel sources. Renewable fuels would include ethanol, biodiesel and other motor vehicle fuels made from renewable sources. In a December 2005 rulemaking, EPA set the statutory default standard requiring that 2.78 percent of the gasoline sold or dispensed in calendar year 2006 be renewable fuel. The new rulemaking proposes a comprehensive, long-term RFS program starting in 2007. The system allows renewable fuels to be used where they are most economical, while providing a flexible means for industry to comply with the standard. The Renewables Portfolio Standard (RPS), which a number of US states already have, has still not been regulated at the federal level. The RPS is a flexible, market-driven policy that can ensure that a minimum amount of renewable energy is included in the portfolio of electricity resources serving a state or country. By increasing the required amount over time, the RPS can put the electricity industry on a path toward increasing sustainability.

Andrew Kingston - Dynamotive Energy Systems Corporation

Mr. Kingston was appointed President and CEO of Dynamotive in April 1999. Dynamotive Energy Systems Corporation develops and markets biofuel technology and products. Dynamotive produces and markets carbon-neutral liquid fuels produced from cellulosic biomass. The company, and its blue-chip partners and customers, are emerging leaders in converting both biomass residues and energy crops into fuels that are technologically viable and environmentally sound, as well as economically competitive to fossil fuels. Dynamotive commercializes a patented fast pyrolysis process that converts forest residues (bark, sawdust, shavings, etc.) and agricultural residues (sugar cane, cornhusks, bagasse, wheat straw, etc.) into liquid bio oil and char. bio oil is a clean burning, greenhouse gas neutral fuel.

Biomass is an almost inexhaustible source of energy. However, to use it effectively it has to be managed with sustainability. Furthermore, it has to be competitive with respect to other fuels without relying on subsidies. The economic barriers of biomass import and export are being eliminated. Dynamotive fits the biomass energy model into the petroleum energy model. Brazil did the same with ethanol by imposing its use over gasoline, which produced great benefits. Between 1977 and 1996, Brazil invested 26 billion dollars to develop its energy program, saved 70 billion dollars in petroleum imports, and made its sugar cane industry the most competitive of the world. The same thing can be accomplished with biomass. However, a development step must take place first.