Advanced Alternative Energy Corp.

www.aaecorp.com

BRINGING POWER TO THE PEOPLE

Introduction to AAEC

AAEC is a technology development firm located in Lawrence Kansas

Les Blevins, Jr.
Founder and Inventor
Sequential Grates System

AAEC is developing technology for helping to solve the climate crisis, to provide heating, electric power and other valued energy forms, to help developed and developing countries avoid over dependence on finite fossil fuels by empowering expanded use of a variety of biomass and waste fuels for space heating and in industrial processes, including power and biofuels generation. AAEC's goal is empowering humanity in achieving a greater measure of energy efficiency, environmental sustainability and energy security.

The AAEC technology lines will consists of fossil fuel, biomass and waste utilization products such as furnaces, water and space heaters, combustors, boilers and gasifiers.

Biomass refers to biological materials such as trees, plants, manure, and various wastes. Using various transformation processes such as combustion, gasification and pyrolysis, biomass can be transformed to heat, chemicals, biofuels, or electric power and used for energetic purposes. In the 18th and 19th centuries, wood was gradually replaced by fossil fuels (coal, oil and gas) which had higher energy density. There is now a growing interest in bioenergy which can be produced and used in varying and efficient ways using modern technologies for the production of biomass derived heat, power and transportation fuels. Biomass and wastes can be used in a sustainable manner as a regenerative source of energy. Biomass originates from forest, agricultural and various waste streams. Forest and wood-based industries produce wood which is the largest resource of solid biomass. Biomass procurement from forest to bioenergy plants can see major improvements. All of these conversion pathways use chemical, thermal and/or biological processes.

AAEC is focusing on collaboration in Demand Side, Supply Side, On-Site Heating and Combined Heat and Power, (CHP), Biorefineries and Integrated Gasification Combined Cycle (IGCC) projects, and in offering systems from the village scale to the city scale.

The AAEC approach offers multiple benefits to society, like reduced demand for fossil fuels, reduced greenhouse emissions, additional cash crops for farmers and landowners, which benefit towns and cities in the rural sector and help them to maintain economic viability and prevent poor people from fleeing rural areas to the lager cities.

Fundamental changes are required in this decade, if we are to avoid a collision with our environment our present course is rapidly bringing about. Our practices are altering the environment such that it will surely be unable to sustain many of earth's eco-systems in the manner we now know ever again.

Technological advancements in energy generation and energy efficiency can play a major role in solving the problem. Developing advanced modular biomass and waste processing technologies, and working to implement them widely in distributed On-site installations is the best pathway to better utilization and management of biomass and waste resources, producing from these new sources of heat, power and liquid biofuels such as ethanol, biodeisel, and methane and hydrogen gases.

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Or to find more information about the fuel processing concepts that can be employed in the fuel conversion technology being offered by Advanced Alternative Energy Corp. go to
http://www.nrel.gov/biomass/biorefinery.html

Or

http://www.bvsde.paho.org/bvsacd/cd43/gas.pdf

AAEC is proposing an innovative collaboration in distributed energy combined with carbon capture and carbon conversion and sequestration. AAEC proposes this effort will be followed by manufacture and export of modern distributed power and biofuels production systems designed for clean community to county scale distributed power and biofuels production.

Mounting Costs Slow Clean Coal Push

FutureGen Alliance

Artist's rendering of the proposed FutureGen plant.

The Energy Challenge

By MATTHEW L. WALD
Published: May 30, 2008

WASHINGTON — For years, scientists have had a straightforward idea for taming global warming. They want to take the carbon dioxide that spews from coal-burning power plants and pump it back into the ground.

A Coal Project Derailed

Articles in this series are examining the ways in which the world is, and is not, moving toward a more energy efficient, environmentally benign future

President Bush is for it, and indeed has spent years talking up the virtues of "clean coal." All three candidates to succeed him favor the approach. So do many other members of Congress. And coal companies are for it. Many environmentalists favor it. Utility executives are practically begging for the technology.

But it has become clear in recent months that the nation's effort to develop the technique is lagging badly.

In January, the government canceled its support for what was supposed to be a showcase project, a plant at a carefully chosen site in Illinois where there was coal, access to the power grid, and soil underfoot that backers said could hold the carbon dioxide for eons.

Perhaps worse, in the last few months, utility projects in Florida, West Virginia, Ohio, Minnesota and Washington State that would have made it easier to capture carbon dioxide have all been canceled or thrown into regulatory limbo.

Coal is abundant and cheap, assuring that it will continue to be used. But the failure to start building, testing, tweaking and perfecting carbon capture and storage means that developing the technology may come too late to make coal compatible with limiting global warming. "It's a total mess," said Daniel M. Kammen, director of the Renewable and Appropriate Energy Laboratory at the University of California, Berkeley.

"Coal's had a tough year," said John Lavelle, head of a business at General Electric that makes equipment for processing coal into a form from which carbon can be captured. Many of these projects were derailed by the short-term pressure of rising construction costs. But scientists say the result, unless the situation can be turned around, will be a long-term disaster.

Plans to combat global warming generally assume that continued use of coal for power plants is unavoidable for at least several decades. Therefore, starting as early as 2020, forecasters assume that carbon dioxide emitted by new power plants will have to be captured and stored underground, to cut down on the amount of global-warming gases in the atmosphere.

Yet, simple as the idea may sound, considerable research is still needed to be certain the technique would be safe, effective and affordable.

Scientists need to figure out which kinds of rock and soil formations are best at holding carbon dioxide. They need to be sure the gas will not bubble back to the surface. They need to find optimal designs for new power plants so as to cut costs. And some complex legal questions need to be resolved, such as who would be liable if such a project polluted the groundwater or caused other damage far from the power plant.

Major corporations sense the possibility of a profitable new business, and G.E. signed a partnership on Wednesday with Schlumberger, the oil field services company, to advance the technology of carbon capture and sequestration.

But only a handful of small projects survive, and the recent cancellations mean that most of this work has come to a halt, raising doubts that the technique can be ready any time in the next few decades. And without it, “we’re not going to have much of a chance for stabilizing the climate,” said John Thompson, who oversees work on the issue for the Clean Air Task Force, an environmental group.

The fear is that utilities, lacking proven chemical techniques for capturing carbon dioxide and proven methods for storing it underground by the billions of tons per year, will build the next generation of coal plants using existing technology. That would ensure that vast amounts of global warming gases would be pumped into the atmosphere for decades.

The highest-profile failure involved a project known as FutureGen, which President Bush himself announced in 2003: a utility consortium, with subsidies from the government, was going to build a plant in Mattoon, Ill., testing the most advanced techniques for converting coal to a gas, capturing pollutants, and burning the gas for power.

The carbon dioxide would have been compressed and pumped underground into deep soil layers. Monitoring devices would have tested whether any was escaping to the atmosphere.

About $50 million has been spent on FutureGen, about $40 million in federal money and $10 million in private money, to draw up preliminary designs, find a site that had coal, electric transmission and suitable geology, and complete an Environmental Impact Statement, among other steps.

But in January, the government pulled out after projected costs nearly doubled, to $1.8 billion. The government feared the costs would go even higher. A bipartisan effort is afoot on Capitol Hill to save FutureGen, but the project is on life support.

The government had to change its approach, said Clarence Albright Jr., the undersecretary of the Energy Department, to “limit taxpayer exposure to the escalating cost.”

Trying to recover, the Energy Department is trying to cut a deal with a utility that is already planning a new power plant. The government would offer subsidies to add a segment to the plant dedicated to capturing and injecting carbon dioxide, as long as the utility bore much of the risk of cost overruns.

It is unclear whether any utility will agree to such a deal. The power companies, in fact, have been busy pulling back from coal-burning power plants of all types, amid rising costs and political pressure. Utility executives say they do not know of a plant that would qualify for an Energy Department grant as the project is now structured.

Most worrisome to experts on global warming, the utilities have recently been canceling their commitments to a type of plant long seen as a helpful intermediate step toward cleaner coal.

In plants of this type, coal would be gasified and pollutants like mercury, sulfur and soot removed before burning. The plants would be highly efficient, and would therefore emit less carbon dioxide for a given volume of electricity produced, but they would not inject the carbon dioxide into the ground.

But the situation is not hopeless. One new gasification proposal survives in the United States, by Duke Energy for a plant in Edwardsport, Ind.

In Wisconsin, engineers are testing a method that may allow them to bolt machinery for capturing carbon dioxide onto the back of old-style power plants; Sweden, Australia and Denmark are planning similar tests. And German engineers are exploring another approach, one that involves burning coal in pure oxygen, which would produce a clean stream of exhaust gases that could be injected into the ground.

But no project is very far along, and it remains an open question whether techniques for capturing and storing carbon dioxide will be available by the time they are critically needed.

The Electric Power Research Institute, a utility consortium, estimated that it would take as long as 15 years to go from starting a pilot plant to proving the technology will work. The institute has set a goal of having large-scale tests completed by 2020.

“A year ago, that was an aggressive target,” said Steven R. Specker, the president of the institute. “A year has gone by, and now it’s a very aggressive target.”

Carbon capture and storage - Reality or Illusion

Carbon capture and storage has become a hot topic in the business press recently, touted by some as the emission reducing key to continued use of fossil fuels, and panned by others as a great green scam perpetrated by the oil and gas industry.

The truth is carbon capture and storage is anything but an illusion; but making it a commercial scale reality will require a great deal more than what has been put on the table so far.

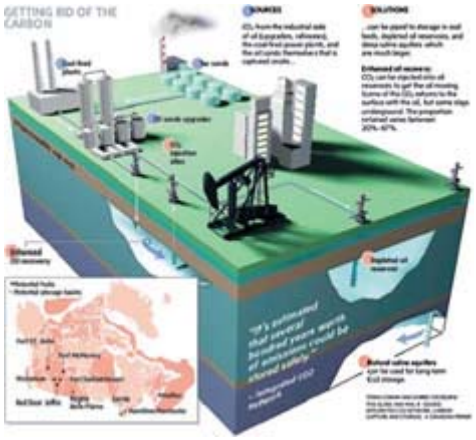
Many countries are relying on CCS as one of the main technological fixes to the seemingly intractable problem of meeting their emission reduction commitments while continuing to source their energy needs from fossil fuels.

CCS is at the core of the recently announced federal strategy to reduce greenhouse gas emissions. The proposed regulatory regime will require that carbon capture and storage (CCS) be built into all new coal-fired power plants and oil sands facilities beginning in 2012, and be fully operating by 2018.

The Government of Alberta has committed to a 14-per-cent cut in emissions over 2005 levels by 2050 and has struck an industry-government council to develop a "made-in-Alberta plan" for the immediate advancement of carbon capture and storage technology.

Leaving aside the vagueness of both the Alberta and federal government strategy statements, the hard reality is that the technologies upon which CCS is based are still in their early stages and the likely costs for their full deployment on a scale that would actually make a difference in reducing CO_2 emissions are astronomical.

Conceptually, there is nothing particularly new in capturing and storing carbon. The technology to capture CO_2 and to pump it underground is commercially available and fairly well developed. Although CO_2 has been injected into geological formations for various purposes such as enhancing oil recovery from near depleted oil reservoirs, the long term storage of CO_2 is a relatively untried concept. **No large scale power plant in the world operates with a full carbon capture and storage system.**



Canada is among the world's leaders in terms of research in this area. EnCana Corporation, one of North America's leading natural gas producers, manages the world's largest greenhouse gas sequestration project at its Weyburn Saskatchewan oilfield operation.

EnCana purchases CO_2 from a coal gasification plant in North Dakota and ships it to Weyburn via pipeline. Apart from giving new life to an old field, the Weyburn sequestration project, a world-scale research initiative operated under the auspices of the International Energy Agency, has confirmed that Weyburn is a suitable reservoir for the long-term geological storage of CO_2.

As noted by Rhona DelFrari, EnCana's Media Relations Advisor, the first phase of the IEA research project is already complete and the results suggest that more than 99% of the CO_2 sequestered at Weyburn will safely remain in the ground for at least 5,000 years.

CCS in geological formations involves injecting CO_2 into rock layers, usually depleted or near-depleted oil or gas fields, deep saline aquifers (porous rock layers containing salty water deep underground, or coal seams that cannot be mined.

A joint Alberta - Federal Government Task Force Report *(Canada's Fossil Energy Future: The Way Forward on Carbon Capture and Storage*) released in January 2008, cites the stable sedimentary rock formations of the Western Canadian Sedimentary Basin (WCSB) as Canada's biggest advantage for CO_2 storage.

"The reservoirs that securely held Canada's vast oil and gas reserves for hundreds of millions of years can be used to store CO_2, and the deep saline aquifers underlying these rock units hold several magnitudes more storage potential," cites the report, which also notes that the co-location of large industrial GHG sources with this storage opportunity makes the WCSB a world-class location for CCS.

The Task Force report optimistically posits that CCS is unique in that it can be built on the technical and institutional base of the existing fossil energy infrastructure and can be implemented quickly (within a decade) using existing technology as the world develops next-generation, longer-term energy solutions.

The report's observation with respect to the time line for CCS deployment is roughly consistent with other estimates. According to the Office of Technology Assessment at the German Parliament (TAB), CO_2 capture will become available for large scale use in 2020 at the earliest.

Where the problem arises, as pointed out by Bruce Cox, executive director of Greenpeace Canada in a March 18, 2008 Globe and mail commentary (*Why Carbon Capture is an Illusion*), even if CCS works it

will kick in too late to avoid the worst excesses of climate change. Cox notes the international consensus is that global greenhouse gas emissions must peak by 2015 then start falling to at least 50 per cent by 2050.

Industry's own predictions don't foresee carbon capture and storage becoming commercially viable before 2020 or 2030, and that will miss the critical threshold for turning things around, notes Cox.

He may be right, but that does not obviate the need to start the ball rolling now.

"By opposing CCS, environmental groups are gambling that we can make the huge cuts in CO2 emissions we need simply by improving our energy efficiency and using renewables like solar and wind power. They may be right. But if they're wrong, they could cripple action against climate change - the greatest environmental threat of our age. It's a dangerous, and seriously imprudent, gamble." - Thomas Homer-Dixon.

Canada's efforts to date are promising, but not nearly enough. The recent federal budget provided $240 million in trust for a full-scale commercial demonstration of carbon capture and storage in the coal-fired electricity sector. This is based on the premise that reducing carbon emissions from coal-fired power plants will make a significant contribution to achieving Canada's greenhouse gas emission reduction objectives.

Budget 2008 also provided $5 million to the Institute for Sustainable Energy, Environment and Economy at the University of Calgary to work with a broad range of stakeholders to resolve "a number of regulatory, economic, and technological issues that need to be resolved to accelerate deployment of carbon capture and storage technologies."

As noted in a recent GLOBE-Net editorial (*Budget 2008 - More Blue than Green*), the jury is still out as to how effective the measures announced in Budget 2008 will be in terms of stimulating the development and commercialization of the technologies needed to cope with the inevitable impacts of climate change. But with respect to carbon capture and storage, a great deal more that $240 million will be required.

Alberta's plan for reducing greenhouse gas emissions involves fines for companies that exceed per-barrel emissions limits. Such fines are expected to put upwards of $177 million a year into the government's Climate Change and Emissions Management Fund, proceeds from which will help pay for projects that reduce the cost of separating carbon dioxide from other emissions or support carbon capture and storage. It still won't be enough to make serious inroads into changing industry behavior or to bring on line a network of carbon capture pipelines and sequestration facilities.

The European Union is well aware of this fact. In January 2008 the EU Commission set out a Directive to enable environmentally-safe capture and geological storage of carbon dioxide in the EU as part of a major legislative package designed to balance the need for urgent action to tackle climate change with the need to ensure security of energy supply. The plan calls for a suite of technologies that would ensure the carbon dioxide emitted by industrial processes can be captured and stored underground and financial aid to enable member governments to support CCS demonstration plants.

Canadian governments, Canadian industry and Canadian consumers will have to spend a great deal more than what is already on the table to finance proving the technological and commercial feasibility of CCS and to deploy that technology on a scale sufficient to make a real difference.

It is the prospect of big money and big profits that has caused some environmental groups to pan CCS as "a public relations smokescreen for the tar sands and coal-fired electricity generation" industries.

As noted by David Keith at the University of Calgary and Thomas Homer-Dixon at the University of Toronto CCS will be a big-industry technology that will require huge outlays of capital, armies of scientists, engineers and construction workers, and will also generate huge profits.

"So when environmental groups saw that industry representatives dominated the blue-ribbon panel, they assumed that the energy industry was once again positioning itself to line its pockets, and attacked its recommendations", the two note in a recent Globe and Mail article entitled *A Win-Win-Win Situation*.

They point out that "It's time that Canada's environmental groups freed themselves of this ideological straitjacket. They need to acknowledge that modern capitalism is the most dynamic, innovative and adaptive economic system human beings have ever invented."

They note also that while capitalism has fuelled our climate problem and that many big businesses have lobbied hard to block serious action, the world is not going to solve the problem without capitalism's help, "albeit capitalism that's ultimately guided by strong government imposed constraints."

This point was made very clear during the recently concluded GLOBE 2008 Conference in a Special Session on Carbon Capture and Storage. The assembled group of experts noted that CCS is proven, safe and Canada's best option for reducing greenhouse gas emissions, but the technology will not become commercially viable without government assistance.

The unanimous opinion of each panelist was that CCS technology was ready for further development and deployment, but without proper climate change regulation and a realistic price on carbon, large scale projects were too risky and potentially uneconomical. (See GLOBE-Net article *GLOBE 2008 Session Update: Carbon Capture and Storage*)

The same point was made in a recent report from the Massachusetts Institute of Technology (MIT) that stressed CCS was the critical enabling technology that would help reduce CO_2 emissions significantly while also allowing coal to meet the world's pressing energy needs. The two key factors needed to ensure its deployment were a significant charge for GHG emissions (a 'carbon price'), and "large-scale demonstration projects of the technical, economic and environmental performance of CCS", said the expert panel behind the report. (See GLOBE-Net article: *Is 'Clean' Coal Possible?*)

Carbon capture and storage is definitely not an illusion; but making it a commercial scale reality - at least in Canada - will require a great deal more than what has been put on the table to date. The Weyburn Saskatchewan project is a start; but much, much more will be required.

Advanced Alternative Energy President Les Blevins sees clean-coal technology as being easily combined with biomass and waste processing in the AAEC Sequential Grates ™ fuels processing system for county and community scale applications. And as being more beneficial overall than in large scale installations based on the central generation model.

Information Sources

IPCC Special Report Carbon Dioxide Capture and Storage

Canada's Fossil Energy Future: The Way Forward on Carbon Capture and Storage

IEA GHG Weyburn-Midale CO2 Monitoring and Storage Project

The Canadian CO_2 Capture and Storage Technology Network

About Feed-in-Tariffs

A Feed-in-Tariff is an incentive structure that boosts the adoption of renewable energy through government legislation. The regional or national electricity utilities are obligated to buy 'green' electricity (electricity generated from renewable sources such as biomass, solar photovoltaics, wind power, and geothermal power) at above market rates. This difference in price covers the cost disadvantages of adopting renewable energy sources and the rate differs between the different forms of power generation. This type of program was first implemented in the USA in 1978, but it is the German model, begun in 1990 and refined in the year 2000 when it became a Federally managed program that has proven to be the world's most effective practice for boosting adoption of renewable energy technologies.

How does a Feed-in-Tariff work: In the effort to combat climate change, the adoption of renewable energy sources has proven critical. One major obstacle to this adoption is the retail price of electricity generated from renewable sources is typically more expensive than the retail price of electricity generated from fossil fuels. A FiT is a revenue neutral way of making installation of renewable energy more appealing. The electricity that is generated is bought by the utility at above market prices. For example, if the retail price of electricity is 10¢/kWh then the rate for green power might be 40¢/kWh. The difference is spread over all of the customers of the utility. For example, if $100,000 worth of green power is bought in a year by a utility that has 1,000,000 customers, then each of those customers will have 10c added on to their bill annually. Thus, a small annual increase in the price of electricity per customer can result in a large incentive for people to install renewable energy systems. This is the essence of a FiT: it is a mechanism to instigate a change in the way power is produced, gradually shifting from present polluting means to non-greenhouse methods.

More on the Carbon Capture and Storage Quest

UK: July 1, 2008

LONDON - Britain was on Monday announcing a shortlist of firms in a tender to build the world's first commercial-scale power plant to burn coal and gas without

adding to global warming.

Carbon Capture and Storage (CCS) promises a technological solution to soaring emissions of the greenhouse gas carbon dioxide from fossil fuel burning power plants -- but with strings attached.

"It is the great panacea. It would mean not having to do the hard things like changing the way we live," said Michael Grubb, chief economist at Britain's Carbon Trust.

"The trouble is that while everybody says it can be done, no one has yet done it. There are very big companies out there with very deep pockets but even they are not doing it." The reason is cost.

"Estimates tend to group around an extra 30 to 50 percent in capital costs and around 15 percent more in running costs of a power station," said Tom Burke of environment lobby group E3G.

At the same time, power output is cut by anywhere between 10 and 30 percent, depending on the technology used.

The resulting extra cost of building and running a CCS power station means no company is prepared to invest in trying out the technology, and perhaps finding ways to improve and streamline it, without enormous subsidies.

The winner of the British competition will get help from the government likely to run into hundreds of millions of pounds.

VAST MARKET

The incentive for power firms is that, if CCS can be made commercially viable, demand for the technology could be huge.

The International Energy Agency says the quantity of coal -- the dirtiest fuel -- being burned worldwide will double to the equivalent of 5 billion tons of oil by 2030.

"Potentially the market for this technology is going to be worth trillions -- of whatever currency you name," said Jeff Chapman of Britain's Carbon Capture and Storage Association.

The carbon is captured either before or after burning a fossil fuel at a power station, then put deep underground in a geological formation such as a saline aquifer or old oil or gas field where it cannot pollute the atmosphere.

Chapman says regulation is needed as well as incentives: "In Australia, Canada, the United States, Germany, the Netherlands and Norway as well as Britain companies are ready and waiting."

The European Union wants 12 full-sized pilot projects to be running by 2015, and the technology commercially viable by 2020.

Utilities such as Germany's E.ON and RWE and oil majors such as Royal Dutch Shell,

Total and BP have voiced an interest, but only in Britain has progress been made with a CCS competition.

MORE AND MORE URGENT

But the problem is increasingly urgent.

Atmospheric carbon is already at 385 parts per million (ppm) and rising at around two ppm a year. Scientists say 450 ppm is equivalent to a rise of two degrees Celsius above pre-industrial levels in global average temperatures, and is about the limit the planet can stand without wholesale extinction of species.

Lars Josefsson, head of the Swedish power firm Vattenfall, told a climate change seminar last week that CCS could account for 3 billion tons of CO_2 abatement globally by 2030.

This would make a sizeable dent in the world's current output of over 6 billion tons of CO_2 a year, even though this figure will rise steeply as countries such as China and India fuel much of their economic expansion with coal.

But no one has yet managed to make CCS work at commercial scale and therefore no one knows the true cost -- or if it really can be a planet saver.

Norway has been storing oil under the Sleipner oil field for a decade with no trouble, but only in a tiny trial.

Middle Eastern oil states are also interested because carbon dioxide has successfully been used to push more oil out of depleting wells and exhausted wells are in effect vast unused parking lots for unwanted CO_2, the main climate culprit.

Masdar, the United Arab Emirates' clean technology fund, is keen to build a national CCS network and Saudi Arabia is also investing heavily in carbon storage research.

China, which is building a coal-fired power station a week, is also interested, and boasts the capacity to store over a trillion of tons of CO_2 underground.

But the scale of the challenge is also vast.

Josefsson said new calculations showed average carbon output had to be cut to just one ton per person by the end of the century to avert dramatic climate change. In the United States it is currently 20 tons, while in Europe it is around 12. (Additional reporting by Simon Webb in Dubai, editing by Kate Kelland and Kevin Liffey)

Story by Jeremy Lovell

REUTERS NEWS SERVICE

The above is being submitted in support of the collaboration proposal AAEC is making to the State of Kansas.

Advanced Alternative Energy Corp.

www.aaecorp.com

Les Blevins and the 'Sequential Grates' fuels conversion and biorefining system, currently patented and under further development.

Les Blevins, Jr.
Inventor
Sequential Grates System

Les Blevins Jr. was born and raised in Kansas.

His background is in the mechanical trades, and he is currently developing innovative concepts to address multiple energy and environmental problems through offering scaleable, clean distributed energy technology with an emphasis on practicality and economy.

Blevins believes humans and the environment are on a collision course. Our activities are inflicting harsh and irreversible damage on the environment and on critical resources. Many of humanity's current practices put at serious risk the future that we all wish for humanity to unprecedented degrees.

Les believes new innovations in fuels processing systems can bring about the needed improvements - and that more than ever fundamental changes are urgent this decade if we are to avoid the life altering collision our present course will bring about. Our practices may so alter the living world that it will be unable to sustain life in the manner we now know ever again if we don't make immediate changes.

Les Blevins became concerned about the future during the middle 1970,s upon reading in the news about oil issues and reading reports on then President Jimmy Carter's position on fossil fuels, the likely effects of our growing energy consumption of fossil fuels on the environment and on international politics.

Blevins believes advancements in energy generation and conservation can play a major role in solving the problem. And he favors developing improved combustion, pyrolysis and gasification methods, and in implementing these new concept systems in distributed and On-site installations as the best means to better utilize very diverse biomass sources, better manage solid, liquid and gaseous wastes, and produce from these a new source of heat, power, liquid fuels such as ethanol and biodeisel, and methane and hydrogen gas.

Blevins decided to look at what he could do to advance the scope of human knowledge on how humanity could address these complex issues. He subsequently decided to look into the possibility that he could best contribute by researching fuels conversion systems designed to reduce dependence on fossil fuels by utilizing diverse low value and widely available biomass and wastes as fuel instead. Thus Les perceived the need for improved biomass conversion technology in the 1970s.

This led to the invention and development of a furnace capable of using bulky biomass fuels such as small square and large round bales of agricultural byproducts like straws, stems, stalks, husks and leaves as well as dedicated biomass fuel crops such as grasses like elephant and switchgrass, miscanthus, sugar cane

bagasse etc. The Blevins system can also use several processes in the conversion of these into liquid fuels as well. These processes include direct combustion, pyrolysis and gasification.

Advanced Alternative Energy is developing an advanced system technology for utilizing a wider range of renewable biomass forms in space heating, heating industrial processes, for use in power generation, and in production of biofuels and other valuable products to help achieve sustainability.

This approach offers multiple benefits to society such as reduced demand for finite fossil fuels and in turn lower market prices for such fuels, reduced emissions of carbon dioxide, the primary greenhouse gas, additional cash crops for our farmers and landowners, which would in turn benefit the farm sector and assist rural areas maintain economic viability.

Les Blevins, seeing increased government dedication to using the technological approach to addressing the nations addiction to oil, and fixing the climate, and seeing the recently completed Oak Ridge National Laboratory report outlining a national bioenergy strategy, indications one billion dry tons of biomass, meaning any organic matter that is currently available on a sustainable basis for displacement of up to 30 % of our nation's petroleum consumption as transportation fuel, now plans to seek funding from the government and from investors for comprehensive technology development, testing and validation of the AAEC patented fuels conversion system.

These funding sources combined with the technology validation process are expected to transform Advanced Alternative Energy Co., from a purely R&D organization to a viable commercial business entity.

AAEC success in finding funding would insure AAEC is able to play a role in achieving an increase in ethanol and other liquid fuels production that would see US transportation fuels from agricultural biomass and wastes increase to 20 percent in 2030 and electrical power from clean coal processes also increase to 20 percent by 2030, 30 percent by 2040 and 40 percent by 2050. In fact, depending on several factors, if the company is able to commercialize its new biomass conversion technology, AAEC could be providing similar systems that could provide similar amounts of renewable bioenergy in many developing countries which would improve our chances of successfully addressing climate change in time to avoid a catastrophe.

For more information contact

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To find more background information about the various biomass and waste processing concepts that can be employed in the fuel conversion technology being developed and offered by Advanced Alternative Energy Corp. go to these additional websites;

http://www.nrel.gov/biomass/biorefinery.html

Or

http://www.bvsde.paho.org/bvsacd/cd43/gas.pdf

Disclaimer Concerning Forward-Looking Statements and Investment Risk

Statements in this press release that are not strictly historical are "forward-looking" and involve a high degree of risk and uncertainty. These include statements related to the ability of Advanced Alternative Energy Corporation's technology to enable the cost-effective production of electric power, cellulosic ethanol and other biofuels, and AAEC's ability to contribute to a reduction in the United States' dependence on fossil fuels, all of which are prospective. Such statements are only predictions, and actual events or results may differ materially from those projected in such forward-looking statements. Factors that could cause or contribute to differences include, but are not limited to, risks involved with AAEC's new and uncertain technologies, AAEC's dependence on collaborations and its ability to achieve milestones under existing and future collaboration agreements, the ability of AAEC and its collaborators to commercialize various products using AAEC's technologies, the development or availability of competitive products or technologies, and the ability of AAEC to enter into and/or maintain collaboration and joint venture agreements. Certain of these factors and others may at some point be more fully described in filings with the Securities and Exchange Commission, but at this time AAEC is making no public offerings that require SEC filings.

KU hopes to reap biorefining bounty

By Mark Fagan

Thursday, August 3, 2006

Kansas University is putting together plans to squeeze a potentially lucrative fuel source — and perhaps millions of dollars in funding — from leftovers from harvested corn, soybeans and other crops.

The KU-based Center for Environmentally Beneficial Catalysis is working on applications for grants that would finance continued research into biorefining, which is a process that converts plant materials into renewable fuels, raw materials and power.

The center hopes to generate $10 million — $2 million per year for five years — to finance the work. The goal is to draw additional investments from industry partners including Archer Daniels Midland, British Petroleum, DuPont, ExxonMobil and Procter & Gamble.

The center's five-year, $17 million grant from the National Science Foundation is scheduled to end in 2008, and officials are identifying the most promising technologies for generating replacement financing.

That's where biorefining comes in.

"Obviously, with the price of petroleum being what it is, this technology is becoming more viable," said Kevin Boatright, a spokesman for the KU Center for Research Inc. "The goal here is to use considerably less petroleum to achieve the same results."

The research, led by KU scientists, one day could help companies reduce their reliance on petroleum to produce plastics, chemicals and other materials, said Bala Subramaniam, the center's director and a KU professor of chemical and petroleum engineering.

Photo by Richard Gwin

Corn is a major cash crop in Douglas County, but soon its post-harvest byproducts could be used to fuel Kansas University research into biorefining — a process that could help cut use of petroleum in manufacturing.

Even if it takes awhile.

"In two to three decades, there will be an increasing shift toward alternative feedstocks, such as biomass, because of the depleting crude oil supply and increasing costs," he said. "The challenge is to develop biomass conversion technologies that are economically viable. Research must start now to make that happen."

The center plans to seek financing from a variety of government sources, including the U.S. Department of Energy, U.S. Department of Agriculture and state agencies.

Liz Brosius, KEC Director
1500 SW Arrowhead Road
Topeka, KS

Dear Ms Brosius,

I have invented developed and patented a revolutionary clean energy technology that I believe offers Kansans a much better opportunity than Mr. T. Boone Pickens' or any other plan can; and

I would like the KEC Members to know that I wish to extend (and am in fact extending) a formal proposal for a joint, collaboration project between myself, and my small company, and the State of Kansas, in making clean energy available for all residents of Kansas throughout the remainder of the 21st Century and beyond.

The technology is designed and intended for community supported energy and I am proposing collaboration in community supported energy based on the concept of making conversion of locally available resources to electric power and biofuels available in every county in Kansas that might want to do so.

Last year I made my collaboration proposal to the City of Lawrence under the assumption that **if** I could interest Lawrence in signing on in principal to this project it would help me gain the interest of the Governor and that of the KEC.

I addressed my letter to then Mayor Sue Hack who indicated she would respond to my letter. She did not -- and I can only assume it was because she felt unable to respond due to not knowing what the

position of Lawrence should be, let alone what the State of Kansas position would eventually be whenever Kansas policy makers were finally able to develop and decide on an energy plan for Kansas.

My proposal is consistent with positions Kansas has already decided on and could empower Kansas institutions of higher learning to be in the forefront of cutting edge technology development.

For more detail on my proposal please see the attached letter I forwarded to Lawrence Mayor Sue Hack, to Sunflower Electric Power Company and another attachment providing more background information.

Thank you

Les Blevins
Advanced Alternative Energy Corp.
1207 N 1800 Rd.
Lawrence, KS 66049
Ph: 785-842-1943

Cc to select others

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Community Energy Advantages

March 4, 2008

by Tam Hunt

"Community energy" projects are generally defined as those between one and 20 megawatts (MW). This is a sector that is often overlooked -- small-scale renewables like solar photovoltaics, and large-scale renewables like wind, geothermal, and concentrating solar power, receive far more attention.

The advantage of community energy projects is that communities can develop these projects themselves, using local funding if available, and add significant amounts of renewable energy to their local grid without waiting for outside developers.

There are many ways businesses and local governments can build community energy projects.

First, most states now have "net metering," which allows utility customers to build a renewable energy system to meet up to 100% of their electricity needs and receive credit, on an annual basis, for any excess power produced. For example, if a solar system is installed that produces too much power for the customer in the summer, but not enough power in the winter, the utility will credit the excess produced in the summer back to the customer, allowing for the system to cover up to 100% of the customer's electricity needs on an annual basis. California's net-metering law only allows systems up to one megawatt, however. New Jersey allows up to two megawatts.

The major problem with net metering is that a customer can't make money be selling excess electricity to the grid, so it's not an incentive to build large amounts of new renewables.

One solution for this problem is a "feed-in tariff," which does allow a customer to make money for excess power produced. Under California's just-approved AB 1969 feed-in tariff system, customers can building renewable energy systems up to 1.5 MW and can sell up to 100% of the power produced to the utilities for a set price. The utilities have to accept the power at the set price. However, the total new capacity under this feed-in tariff is capped at 478 MW state-wide.

Similarly, Washington State has a feed-in tariff for solar systems, which pays customers varying amounts, depending on whether they buy components made in Washington State. However, the system is still not up and running due to delays in the regulatory process.

The feed-in tariff is a great way for local governments and businesses to offset their own emissions by achieving up to 100% renewable energy, while paying less than other methods would cost. It's also possible to make money by selling power to the grid in some situations under the feed-in tariff.

The 1978 federal Public Utilities Regulatory Policy Act (PURPA) has been gutted by Congress in recent years for some parts of the country. However, in California, the Public Utilities Commission is about to approve a new set of "standard offer" contracts for Qualifying Facilities, as part of California's implementation of PURPA. These contracts will be familiar to those who were in the wind business in the 1980s, when standard offer contracts were common under an earlier incarnation of PURPA. The new contracts will allow customers to build Qualifying Facilities (QF, renewable energy or co-generation facilities) up to 10 MW and sell excess power to the utilities at a set price.

PURPA was the original feed-in tariff, which sparked the movement that is now very popular in Europe. However, in the U.S., the "avoided cost," which is the basis for the price paid to QF owners for power produced, has been far too low over the last two decades for many new projects to come online. With natural gas and other fossil fuel prices skyrocketing yet again, the avoided costs have reached the point where many renewable energy and co-generation projects should be able to make money at the avoided cost.

Last, Community Choice Aggregation offers a much more powerful tool for local governments to seriously invest in renewable energy for themselves and their constituents. Community Choice is available in California, New Jersey, Ohio and Massachusetts. Under Community Choice, local governments can build or buy power and achieve up to 100% renewable energy, if they choose to do so. There are significant potential cost savings because Community Choice agencies have access to very low interest money, don't need to make a profit, don't pay taxes, and don't need to pay exorbitant salaries to top executives. Community Choice offers a more complete solution than the other options listed above, but the road is fairly long because of the process required to become an "aggregator."

In California, the San Joaquin Valley Power Authority, Marin County, the City and County of San Francisco, Chula Vista, and many other local governments are at various stages of

implementation. Once we have a few examples of Community Choice implementation, we can expect many others to follow suit as interest in mitigating greenhouse gases and increasing energy independence grows.

Tam Hunt is the Energy Program Director and Attorney for the Community Environmental Council. More information on our programs can be found at www.fossilfreeby33.org.

On the Clean Cutting Edge

Planned Illinois plant should serve as a reference for coal-gasification benefits for future coal facilities.

By Don Talend

A couple of decades from now, power plant owner-operators could be looking back at the seed in America's Heartland that sprang up a crop of coal-gasification plants a little like Midwestern cornstalks during growing season. Just as specific soil, climate, and geography suit specific crops, the Taylorville Energy Center in central Illinois will utilize integrated gasification combined cycle (IGCC) technology because the conditions present make it the logical strategic choice.

Gasification—converting coal to a gas—is not a new idea in general, having been invented in the early eighteenth century in Scotland. Bringing its environmentally superior profile to commercialization, however, has been a challenge. One of just a handful of IGCC projects with permits currently in application, the planned Taylorville facility is being subcontracted by Eastman Gasification Services Co. of Kingsport, TN---the first company to commercialize gasification in the US.

The 644-MW Taylorville facility, which is being built by Louisville, KY--based private developer The ERORA Group, is on track to begin commercial operation in late 2009 or early 2010 and might very well serve as a prototype for commercial IGCC power generation in certain instances for the following reasons:

- competitive pricing of output;
- environmental benefits;
- chemical co-production capability;
- local regulatory environment/receptiveness to coal usage;
- amount of output; and
- local feed properties and availability.

Competitive Pricing of Output

The ERORA Group has significant experience with developing conventional pulverized coal (PC) power plants and initially planned to use that technology for the Taylorville project. David Schwartz, principal with ERORA, notes that a feasibility study undertaken by GE Gasification and Kansas City, MO--based construction and engineering firm Burns & McDonnell indicated that the IGCC process will enable the developer to price the output of the Taylorville facility lower than that of PC. Assuming that environmental regulations are met, pricing is the foremost issue in choosing an energy production technology, Schwartz notes.

"Ultimately, the capital and operating costs impact the price of the final product, but it's important to focus on the final price of the product and not the installed per-megawatt cost," Schwartz notes. "While that's important, it's not the only factor that determines the final cost of the electricity. What's important is whether we can produce the electricity at a price that is attractive to the market. While we acknowledge that IGCC is probably more expensive to build and operate, there's no agreement as to the magnitude of that differential. Just because you can build and operate a plant doesn't necessarily mean that you can

produce a product with a market value; the product has to have a price that will be attractive to the customer." An attractive price point creates an acceptable payback period for the investment, he adds.

Published reports have claimed that the capital cost of IGCC facilities is about 20% higher than that of PC, with efficiencies driving the cost down. Still, Schwartz is skeptical about that figure.

"I've heard that 20% number bandied about, but I'm not sure where that number comes from. While we acknowledge that IGCC is more expensive, it's not 20% more expensive. In order to get that installed-megawatt cost down, some economies of scale have to be brought to bear" for PC to match the efficiency of IGCC, meaning the output must be in the 1,000-MW range. "More importantly, it's not the differential installed cost, it's the price of the output. Even assuming the 20% differential, if I'm able to sell the output cheaper from an IGCC plant, I'm not sure that 20% matters. For us, the real backbone of the decision to go with IGCC was the fact that we believe the output from the facility will be more attractive in terms of price, reliability, and availability than the price, availability, and reliability of a similar product from a pulverized coal facility."

Environmental Benefits

IGCC is the best available coal-burning technology in terms of minimizing emissions of sulfur, mercury, and particulate matter, and it facilitates the capture of carbon. Its superior environmental profile to PC makes it easier for the developer to obtain an air permit, generate goodwill among the local community and environmental groups, and adhere to potentially stricter regulations in the future.

The Taylorville facility feasibility study compared the projected emissions of key pollutants under an IGCC scenario with those of the most recently permitted PC plant in Illinois at the time and, while PC is certainly an environmentally viable technology, IGCC generally projects out at a superior level (see table).

Even though current regulations do not require the capture and sequestration of carbon dioxide, it is much easier and less costly to do it with the syngas produced during gasification than with carbon exhaust gas. "One of the advantages of IGCC over the next 20, 30, 40 years is that if at one point over that next half century there are regulations that require retrofitting, how to do it and the cost ramifications are at least understood today," Schwartz says. "They're not known to the same degree with respect to pulverized coal. The general consensus among the industry is not if but truly when, and we'll be able to address it."

One environmental benefit of IGCC that should not be overlooked is a reduction in water usage when compared with conventional PC. In the PC process, all of the output is produced by a steam turbine, which requires a large volume of water for cooling. More than half of the output in IGCC, in contrast, comes from combustion turbines and the remaining 42% from steam turbines.

Local Regulatory Environment

Schwartz indicates that IGCC generally is viewed favorably among communities and environmentalists, and the environmental benefits of the technology should result in favorable action since the filing of the Taylorville permit in April 2005.

David Gallaspy, lead on the project for IGCC technology pioneer and ERORA project partner Eastman Gasification Services, feels that the permit application process was easier for ERORA due to the mere presence of IGCC. "When you go with IGCC, you can get more support from your local jurisdiction for zoning, and you also get a pretty good response from the state for the overall permitting process," he says. "Even though you may have the law on your side as far as meeting permitting requirements, if you don't have community support, there are a lot of roadblocks that can be put in the way. One of the things that is

overlooked is getting the support that you need---the zoning, the permitting, getting all of the local support---which makes the project happen quickly."

Schwartz adds that local regulators are taking an appropriately careful approach to the approval process, given the newness of the technology as far as they're concerned. "Pulverized coal can be pretty clean, but IGCC is cleaner, and whether it's the permitting agencies or the environmentalists, they are more receptive to the technology," he says. "There are site-specific conditions that may influence the response to a specific project at a specific site, but as a general statement, I agree."

The most difficult part of the permitting process for IGCC? Noting three separate major processes of gasification, air separation, and the deployment of turbines to generate power with IGCC, Schwartz relates, "The biggest issue has been finding a way to, on paper, ensure---from an engineering and warranty perspective---that the facility is viewed as one facility, not three separate components. Getting guarantees and warranties for any one of those technologies is easy; getting guarantees and warranties with respect to the facility as a whole is where there have been problems. That has shifted significantly with the acquisition by GE of the gasification technology from Texaco. You've got one company that owns both ends of the process, so you don't have that 'our part is working well; it's the other part that's not working.' From a contractual standpoint, it's become a lot easier."

Still, "whether it's regulatory agencies or John Q. Public, there seems to be a growing awareness of IGCC and its benefits," Schwartz says. "That being said, there is not the experience with permitting IGCC that there is with other technologies, and I think that the regulators, appropriately, are approaching IGCC air permits carefully; there isn't a lot of history or precedent for permitting IGCC."

However, "folks who are trying to obtain permits to build pulverized coal facilities are not having an easy time of it," Schwartz continues. "Even if the permits have been issued, the environmental groups have taken issue with those permits. So, from a permitting perspective, it's really unclear how long it will take to get a permit not only through the permitting level but whether it will get through the ensuing litigation."

The coal-friendly state of Illinois does have a generally favorable view of coal, which is to ERORA's advantage in trying to get a cleaner coal-burning technology permitted. "Illinois is also sitting on a lot of coal," Schwartz adds. "The state recognizes that that's a valuable commodity and a valuable resource, and they have taken steps and implemented programs to use that resource in a way that benefits the state. So from that perspective, we very much like doing business in Illinois."

Chemical Co-Production Capability

A significant factor in the economic viability of IGCC at Taylorville---and ERORA's choice of the technology for the project---is its chemical co-production capability. At the permit application stage of the project, no plans were in place for the co-production of a particular chemical or chemicals. However, it is possible to co-produce commodities such as methane, methanol, and fertilizers with IGCC. Eastman Gasification Services, a subsidiary of Eastman Chemical Co., has operated the first commercially available IGCC plant in the US since 1983, and there it co-produces acetic anhydride and acetic acid for production of acetyls, which are used in the manufacture of various consumer products.

"That, above the environmental drivers, is really what switched the Taylorville project over to gasification. It's the value of the co-production," says Brenda Barnicki, managing director of Eastman Gasification Services. "I don't think that can be understated; there's some real value there."

"As we looked at operating scenarios for this facility, we knew that chemical co-production enables us to operate the facility in such a manner that we will be able to produce products that we will be able to sell in the market today, and it will result in a pricing point that we think will be attractive," agrees Schwartz.

“It was chemical co-production that enabled us to make IGCC work from a business perspective. There are lots of advantages to IGCC, but ultimately those advantages don’t have any value if we can’t make the business scenario work; chemical co-production enables us to make the business scenario work.”

Amount of Output

Schwartz and ERORA dispute the notion that PC is significantly less expensive than IGCC from a capital cost standpoint. Even if this were true, Schwartz notes, experience and the Taylorville feasibility study strongly indicate that PC requires a minimum economy of scale to be capital cost-competitive.

“When you look at pulverized coal on a cost-per-megawatt basis, it’s cheaper than IGCC if you make it 1,000 MW plus,” says Schwartz. “If you drop the size of that facility to 400 or 500 MW, the cost of capital demand starts to diminish; get below that, and it starts to swing the other way; in order to achieve those economies of scale, you have to be very, very large. Being very large has a lot of impacts; you’re going to need a lot of water, you need a lot of transmission, and you need a lot of demand.”

Admittedly, little IGCC capital and operating cost data are available because the technology has not yet been commercialized to a great extent. But the financial analyses that took place as part of the feasibility study allowed ERORA to calculate the pricing of the output using projected capital and operating costs, and other inputs.

“The differential costs between pulverized coal and IGCC are driven by how large the pulverized coal station is,” Schwartz says. “If you compare a 600- or 644-MW IGCC plant with a 1,000-MW pulverized coal plant, we have a higher capital cost” with IGCC. “If you compare a 500-MW IGCC plant with a 1,000-MW pulverized coal plant, you’ve got a higher capital cost, too.”

Local Feed Properties and Availability

Two reasons coal in general and IGCC in particular suit the Taylorville project are the site’s location on the Illinois Coal Basin and the opening of a new coal mine nearby. “The coal plant is a great corner customer, someone who will have enough coal usage to justify a new mine,” says Schwartz. “That’s how we ended up there.”

“One of the reasons that the Taylorville project is looking at the state of Illinois is that they have rich coal resources,” reiterates Barnicki. “It’s generally higher sulfur coal than some other areas, so, historically, they’ve had a difficult time burning that coal in traditional power plants. Illinois is a very attractive place for coal, so Illinois is a great place to build a gasifier.”

sidebar

Generally speaking, coal is a resource that the US would do well to utilize for energy production, so long as environmental concerns can be adequately addressed in an economically viable fashion. Estimates of US coal’s supply availability range from 200 years to 250 years---up to six or seven times that of natural gas---while natural gas prices recently have climbed due to tightening supplies. More than half of the electricity generation in the US utilizes coal.

“I think that certainly reliance on natural gas as a fuel of the future is probably a mistake, and learning how to use this country’s coal reserves in a way that makes sense economically and environmentally is something that people should be focused on,” notes Schwartz. “We think that IGCC is certainly a big step in that direction. We’re proponents of IGCC; therefore, we’re proponents of the use of coal. We do think that coal has a role in the energy future of the country, and there are a host of reasons; it reduces dependence on foreign sources of energy, as well.”

As for the future of IGCC, Schwartz and ERORA have high hopes for the Taylorville project. But, he notes, it’s difficult to predict how commercialized the technology will be several decades in the future.

“I think that IGCC has a role in the future,” he says. “It can play an important role in terms of providing energy on a cost-effective basis and in an environmental fashion. I don’t think it’s the right solution for all situations, but I think it has an important role to play.”

Communications specialist DON TALEND *resides in West Dundee, IL.*

DE - November/December 2005

One man's trash... is another man's energy-rich biomass

March 22, 2007

The idea sounds so outrageous that one is tempted to dub it Fitch's Folly.

Warrenton VA Mayor George Fitch has set a new goal for himself: To make his town "energy independent" within the near future.

Fitch wants to create ethanol and generate electricity using biomass as a feedstock and fuel. What kind of biomass? All kinds. The waste that goes into the county landfill. Tree clippings from forest maintenance. Corn husks and switchgrass. Wooden construction debris. Old tires. Sewage sludge.

Virtually any organic waste that can be rounded up from within a 20-25 mile distance from town that other people would let rot or, better, pay to get rid of.

After extensive research, Fitch has conceptualized a project that would cost about $30 million. It would generate about five megawatts of electricity for sale into the electric grid, enough to power about 5,500 households, and would yield 10 million gallons a year of ethanol.

As long as the price of ethanol stays above $1.25 a gallon (it's about $2.25 right now) and the price of crude stays above $38 per barrel (it's over $60), he says, the project will be profitable.

"I'm a fiscal conservative," says Fitch. "Government shouldn't be wasting peoples' money. We have a landfill. We're taking garbage and burying it in the ground." That just doesn't make sense, he contends, when the garbage is loaded with BTUs that can be converted into electricity and liquid fuel.

Fitch is working to "tee up" the project, ensure a reliable supply of biomass feedstock, find a private-sector operator to take ownership, and lobby for federal loan guarantees to reduce the risk for investors.

His goal is to negotiate terms that would allow him to re-sell the electricity to Warrenton residents for about half of what Dominion charges.

"If my residents are paying 5.9 per kilowatt to Dominion," he says, "let's bring that down to three cents."

The gasification technology is well understood, although the engineering probably will need tweaking to accommodate the wide range of waste products that Fitch contemplates.

As the mayor describes it, the process entails heating the waste materials to an extremely high temperature in the absence of oxygen - as high as 2,000 degrees - then cooling it to 98 degrees.

The material would not burn, it would gasify, leaving about 2 percent of the original volume as residue to dispose of.

Waste heat from the cooling would be used to generate electricity, while the organic compounds in the gases would be converted into ethanol.

If the Warrenton project pans out, Fitch sees the idea spreading nationally.

There are implications for Virginia energy policy, too. The environmental community is pushing a Renewable Portfolio Standards bill that would require Virginia electric utilities to generate 12 percent of their power from renewable energy sources by 2020.

Although the legislation has been sidetracked while the General Assembly takes up re-regulation of the electric power industry, the issue is not likely to go away. Municipal projects built around local landfills across the state could make a significant contribution to that 12-percent goal.

Small-scale projects like the one Fitch proposes, are consistent with a "distributed generation" approach to organizing the electric power grid.

In theory, an electric grid consisting of many small producers located close to their consumers is more stable and less vulnerable to disruptive blackouts than a system depending upon massive power plants linked by equally giant transmission lines.

"If you drop in a five-megawatt plant and flow the power into the distribution grid, there's a range of benefits," says Brad Schneider, founder of Recovered Energy Resources, a Rappahannock County company that designs biomass-to-energy plants, who has advised Fitch.

Balancing the grid with locally generated electricity affects the harmonics and stability of the system.

For Warrenton and the northern Piedmont, grid harmonics are no small thing.

Dominion wants to run a transmission line through the region in order to wheel more electricity from the Midwest into Northern Virginia. Not only would a Warrenton power plant increase the supply of locally generated electricity, a better load balance in the region might enable the power company to increase the capacity of existing transmission lines.

Fitch has had conversations with oil giant Chevron, which wants to get into the field.

The next phase of the project is finding $300,000 for design and engineering. That's more than Warrenton can afford, but Uncle Sam is handing out renewable-energy grants like bingo cards in an old folks' home.

Fitch thinks he has a shot at getting support. His argument: A successful demonstration of the technology in Warrenton could open up opportunities for municipalities across the country.

Fitch insists that his project would stand on its own merits. But as gravy for investors, there is a host of credits and incentives. There's a 51 cents per gallon credit for ethanol, plus an extra ten cents a gallon for small producers.

There's a credit of 1.5 cents per kilowatt hour for producers of "green" electricity, and $20 per ton for using agricultural/forest residue to produce energy. A loan guarantee from the federal government would eliminate any remaining risk for private investors.

Also working in Fitch's favor: The Kaine administration is eager to support renewable fuels in Virginia.

Although the Commonwealth has limited resources to devote to the sector, it can function as an

intermediary between entrepreneurs like Fitch, academic resources and market opportunities.

Dr. Y.H. Percival Zhang at Virginia Tech has developed a promising biochemical process to convert cellulosic material (wood waste, corn stalks, and switchgrass) into ethanol in small-scale biorefineries.

Meanwhile, the Department of Mines, Minerals and Energy has spotted some potentially large-scale ethanol customers in the state - the oil refinery in Yorktown is one, military bases are another - to which local vendors could sell.

Fitch is bursting with enthusiasm at the potential for his project. He thinks he's got all the angles covered, although he's wise enough to temper his comments with a note of caution: "There's a huge caveat. Like most things new, you go through a trial-and-error process. You go up the learning curve."

Jim Bacon, of Richmond, publishes the Bacon's Rebellion Web site and authors the column of the same name.
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