

“BIOMASS ENERGY AND JOB CREATION IN VIRGINIA”

KEYNOTE ADDRESS

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Introduction

At the Paris World’s Fair in 1900, Rudolf Diesel, the inventor of the diesel engine, demonstrated his new engine using peanut oil. A few years later he said, and I quote:

The use of vegetable oils for engine fuels may seem insignificant today. But such oils may become in the course of time as important as the petroleum and coal tar products of the present time.

On the evening of September 29, 1913, Rudolph Diesel boarded the post office steamer *Dresden* in Antwerp on his way to a meeting of the Consolidated Diesel Manufacturing Company in London. He took dinner on board the ship and then retired to his cabin at about 10 p.m., leaving word to be called the next morning at 6:15 a.m.. He was never seen alive again. Diesel’s death and the discovery and development of cheap petroleum, meant the end of biomass as a major fuel for the next 80 years.

But biomass is now back and, to risk a pun, growing like a weed. Not just bio-fuel, but also biomass fired power plants, combined heat and power using biomass fuel, biomass pellet plants and landfill gas. And because biomass is back, it is having a significant economic impact in Virginia and across the nation.

My assigned topic today is Biomass Energy and Job Creation, and I will mostly keep to that topic. But I will also touch on several related topics including other economic benefits of biomass in addition to job creation.

I address these topics from a fair degree of personal knowledge. When I was Secretary of Commerce and Trade of Virginia, under then Governor Mark Warner, the departments of forestry and agriculture were within my Secretariat. From Jim Garner at DOF I learned one of my favorite factoids about biomass in Virginia. I used to pose this question to legislators occasionally and I’ll ask you the way I asked them:

We have about 15,500,000 acres of forestland in Virginia today. How many acres did we have in 1900?

Anybody want to hazard a guess? The counterintuitive answer is that we had about 10,000,000 acres of forests in Virginia 110 years ago – 50% less than we have today. This fact is a reminder for me of the richness of the biomass resource in Virginia.

Also, in my day job as a lawyer, I spend most of my time representing companies that develop biomass power plants and biomass-fired combined heat and power projects.

And finally, I am the chairman of the board of a biomass development company that has developed and now operates one biomass power plant in Florida and one in Georgia.

So I have seen many of the biomass issues from a variety of perspectives – governmental, professional and as an investor.

What is biomass?

When I was preparing for these remarks, the first question I asked myself was “what is biomass energy?” What is included within that term? Does it include municipal solid waste fired power plants? Does it include landfill gas? What about industries that burn biomass waste to generate steam or heat? What about paper mills that have large recovery boilers fueled by black liquor and that may also cogenerate power to the grid?

I have decided, somewhat arbitrarily, that for the purposes of this speech, biomass energy includes the following:

- Biomass-fired power plants
- Biofuel plants – ethanol and biodiesel
- Combined heat and power plants fueled with biomass
- Industrial thermal plants fueled with biomass
- Power plants co-fired with biomass and other fuels
- Pellet mills
- Landfill gas facilities AND
- Poultry litter, algae facilities and other developing technologies

That excludes MSW-fired plants, on the theory that they burn both biomass and non-biomass materials, but is otherwise a pretty inclusive definition of biomass energy.

What is the biomass energy industry in Virginia?

So, with this definition of biomass, what does Virginia’s biomass energy industry look like? Surprisingly, I found that rather difficult to figure out. There appears to be no clear source or database that tracks the various parts of Virginia’s biomass industry. The VBEG may want to consider taking that on as a valuable data gathering function.

I therefore looked at a variety of data sources. These included information from the State Corporation Commission on operating power plants in Virginia, boiler permit data from Virginia DEQ, information from the Virginia Department of Forestry and the Virginia Economic Development Partnership, newspaper articles, and information from proprietary databases. Based on that research, here’s my census of operating biomass plants in Virginia:

- Two stand alone power plants, including Dominion’s large Pittsylvania Power Station at Hurt, and its smaller plant at Altavista.

Nine biofuel production facilities including the new barley-based Osage ethanol facility in Hopewell. I believe the other 8 biofuel facilities are all biodiesel.

Seven pellet mills, with several new ones announced or under construction.

Seven landfill gas fired power plants, also with several more announced.

Two biomass fired combined heat and power plants, at the MeadWestvaco mill in Covington and the Smurfit-Stone paper mill in West Point.

I was unable to get good numbers on thermal only facilities. The data bases I looked at included industrial facilities I knew were now closed, and in other cases I couldn't tell what the permit data meant. For example, I know that Longwood University has a biomass-fired steam plant, but that never showed up in the data I had available to me. As a result of either this lack of data, or my poor research skills in finding the applicable data, I know that I am undercounting biomass fired thermal plants at both Virginia's industrial sites and at its governmental buildings.

Jobs Impact

Using this project census, I then tried to determine the jobs impact on Virginia of our biomass industry. For starters, let me just say that the jobs impact is significant.

Consider, for example, the impact of Dominion's Pittsylvania Power Station. It is the largest stand-alone biomass fired power plant in the United States, and has been for more than 15 years since it was first commissioned.

It has 28 full time employees, spends about \$15.7 million each year on wood fuel, and generates millions of dollars of income for the local community. Based on work that Chmura Economics has done for other Dominion facilities, I calculated that the Pittsylvania plant generates about 75 jobs in Pittsylvania and surrounding counties plus the number of jobs it generates for timber cutters, saw mills and fuel haulers. I have been unable to quantify the jobs created in connection with the fuel suppliers to Pittsylvania. Studies done for the South Carolina Forestry Commission for a theoretical 40 MW biomass facility suggest that Pittsylvania creates about 40 jobs in the trucking industry alone. So I'm going to estimate that Pittsylvania creates, in total, somewhere between 150 and 250 jobs each year.

Part of what I want to point out in this somewhat dry analysis is the difference in economic impact between, say, a natural gas fired power plant or a petroleum refinery, on the one hand, and either a biomass fired power plant like Pittsylvania or an ethanol refinery like the Osage Hopewell plant. A natural gas plant pipes gas in from Texas or the Gulf of Mexico which is then used to fuel the power plant. The petroleum refinery tankers in petroleum from Texas or Venezuela and then refines it.

In contrast, a biomass power plant is fueled by locally produced wood or energy crops that are grown by local tree owners or farmers, cut by local timber men, and trucked in by local drivers. Feedstock for the Osage plant is grown by local barley farmers, instead of being carried to Virginia by tankers from Saudi Arabia or maybe floating in from the Gulf of Mexico.

In general, to be economically feasible, biomass energy has to run on locally grown feedstocks. It is simply too expensive to ship in wood from 100 or 200 miles away, or to haul in corn or soybeans from the Midwest. In general, biomass only works if fuel or feedstocks are grown and available locally. That has the effect of greatly magnifying the jobs and economic impacts of biomass energy.

Data on pellet mill employment comes principally from job numbers generated by VDEP for new pellet plants since 2007. Those facilities average around 29 employees each, but those numbers do not include any indirectly created jobs including any jobs at the fuel suppliers. And I have very little data on biofuel plants other than Osage or on employment at the cogen facilities at Covington or West Point.

Nevertheless, based on the data I do have, and ratios for indirect jobs applicable to similar facilities, I arrive at a total of approximately 1004 biomass energy created jobs in Virginia from ongoing plant operations. I should note also that this number assumes that Virginia farmers grow only about 25% of the barley to supply Osage.

1,004 jobs is a lot of jobs. And I suspect that number is, if anything, a little low because of my uncertainty around indirectly created jobs, particularly among farmers and wood suppliers. Moreover, this number does not include jobs at biofuel distribution companies, the jobs that are created at companies like Afton Chemical that make additives for biofuels, the office and back-office jobs at biomass companies and utilities, or developers like Ray Booth or the people at Intrinergy, or English Boiler Company.

Moreover, this number does not reflect the jobs created when a biomass facility is under construction. A large biomass facility like Osage or Hurt typically takes two or so years to construct and creates several hundred jobs in the construction industry and as a result of the construction jobs.

Other Benefits

So Biomass Energy creates a lot of jobs in Virginia, and will continue to do so for many years.

But looking at the job statistics alone – significant as they are – really understates the economic value of biomass energy to Virginia and to Virginia’s economy. Let me focus on three of those other benefits.

First, most of the jobs that biomass energy creates are in places that badly need those jobs. The bulk of these jobs aren’t being created in Fairfax County and Henrico. They

are, instead, being created in Pittsylvania County that has an unemployment rate of 10.3%, the City of Hopewell with an unemployment rate of 10.1%, Greensville County with an unemployment rate of 9.5%, Covington with an unemployment rate of 10.4%, and Henry County with an unemployment rate of 14.3%.

These jobs are being created in the farmlands and forests along the southern tier of Virginia. These areas have been hurt badly by economic change. Textile mills have closed down. Tobacco production is a fraction of what it once was. Furniture factories have shut all across this part of Virginia. One of our largest paper mills has recently closed in Franklin and other paper and packaging companies have closed smaller plants in Halifax and elsewhere.

Because our timber industries supplied the furniture factories and paper mills, our timber cutters and saw mills have struggled. And those struggles have been exacerbated by the now two-plus year depression in the construction industry. Biomass energy tends to create jobs where the biomass is located. And that means rural Virginia, particularly southside Virginia.

Second, biomass energy provides a number of valuable but indirect economic benefits to Virginia. I commend to you a very interesting study done in 1999 for NREL, the National Renewable Energy Lab. The study is called The Value of the Benefits of U.S. Biomass Power. It focuses on the “ancillary” benefits of biomass power.

These ancillary benefits are: the disposal of more than 20 million tons of solid biomass waste that would otherwise go into landfills, be burned, or be left in the forest to increase the likelihood and severity of forest fires, and the displacement of fossil fuels that would otherwise have been burned to generate the power replace by the biomass generation.

The NREL study estimates the value of the environmental services associated with biomass energy production as being 11.4 cents/kWh. For an 83 MW plant like Pittsylvania, that operates at a 66% capacity factor, the NREL study suggests \$46,226,400 of indirect environmental value produced by that plant alone. Admittedly, the NREL study and the values it generates depend in part upon the value of green house gas offsets and credits. But even if the available GHG credits are worth nothing, the value of the ancillary services is still high – more than \$0.5 cents/kWh.

Similar indirect benefits are available from biofuel plants. The Osage Hopewell ethanol facility uses hull-less barley as its feedstock. With Osage as the buyer, Virginia farmers have expanded Virginia’s production of barley from 67,000 acres in 2009 to 105,000 acres in 2010. Moreover, barley is a winter crop in Virginia that reduces nutrient runoff and soil erosion while still enabling summer soybean crops. Thus, the barley that fuels the Osage plant is both economically and environmentally positive for Virginia, her farmers and the troubled regions of its economy.

The Bigger Picture

Ironically, the need for biomass energy has never been on better display than during these past few weeks.

The Richmond Times Dispatch reported yesterday that sea levels are rising all along Virginia's southeastern coast. Apparently they have been rising at about one foot per century for a number of centuries, but now the rate is accelerating. The City of Poquoson experiences regular flooding already.

The midrange estimate is that the sea level in the Tidewater area of Virginia will rise another 3.7 by 2100. If that happens, huge areas of coastal Virginia will be under water or under constant threat of flooding at high tide or during even mild tropical storms. Hundreds of thousands of people will need to move inland or else those cities will be forced to build huge dikes. Either outcome is hugely expensive.

The principal culprit in this looming sea-level catastrophe is global warming. By displacing and even replacing fossil fuel generation, biomass energy reduces the greenhouse gas emissions that cause and accelerate global warming.

The more current catastrophe is, of course, the oil well blow-out in the Gulf of Mexico. The reason we are drilling in 5,000 feet of water in the Gulf is because of our need for oil to run our cars and trucks. And oil is hard to find today, so we drill in places where the risks are greater and the costs are higher. Do any of you doubt that we would have been at war this long in Iraq if we were not concerned about oil and security of our oil supply?

Our dependence on oil in general and on foreign oil in particular forces cost on us as a nation that we rarely quantify, and probably couldn't even if we tried. But the fact that we don't or can't quantify those costs doesn't mean that they don't exist.

Just as biomass power reduces our dependence on fossil fuels for power generation, biofuels reduce our dependence on oil and foreign oil. The US will produce between 11 and 12 billion gallons of ethanol and biodiesel combined in 2010. That sounds like an enormous amount, and it certainly is compared to prior years production.

However, even that 12 billion gallons only represent about 15.2 days of 2009 US oil consumption. Just 15.2 days! Our oil appetite is insatiable. As a nation, we consumed in 2009 about 785 Million gallons of oil per day. Of that amount, about 62.5%, or 490 million gallons/day, was imported. Our current biofuel production, then, would displace about 24.5 days of oil imports. Or to say it otherwise, our anticipated 2010 biofuels production will displace about 6.7% of our oil imports. That's not a gigantic number, but it's not too shabby, and the number is growing all the time.

Summary

Biomass, then, addresses both micro and macro issues for Virginia's economy.

At the micro level, biomass energy is a current source for over 1,000 jobs in Virginia, and more is on the way. Those jobs bring benefits to our farmers and foresters that other energy sources do not. Those jobs are located in places that have been struggling economically for many years.

At the macro level, biomass energy helps Virginia and the nation address energy and environmental issues that dramatically affect our economy. The costs of our dependence on oil and oil imports can be seen in the Gulf of Mexico and on the battlefields of Iraq.

And the costs of global warming can now be seen not as some theoretical concept, but as an actual and measurable threat to the economy of southeastern Virginia.

Rudolf Diesel was right 100 years ago about biomass energy. It's now time for us to be sure Virginia knows what tremendous benefits biomass energy brings now to our state and can bring to us even more in future years.