

**The Municipal Biomass Business Plan**  
**Prepared by Public Policy Virginia**  
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The Municipal Biomass Business Plan will provide answer to the essential questions needed for the development of municipal bio-power projects; is the feedstock supply reliable, what is the proven technology, and what is the bottom line? The work will be done through management and cooperation with expert contractors who will complete a detailed feedstock assessment, technology analysis, and financial model for a medium scale project in the City of Martinsville and a small scale project in a to be determined location in Southwest Virginia. The outcomes of the project will be two specific business plans along with a final report. The final report will summarize and synthesize the information in a way that will provide support to other locations across the region.

Rising and volatile energy costs have handicapped rural governments. At the same time the recession has compounded financial problems on family farms once dependent on tobacco, and the communities dependent on those farms. Interest in the potential for biomass as a solution for these problems has led to considerable investment in research and testing of various crops, methodologies, and technologies. The construction of SENTECH at the Institute for Advanced Learning and Research in Danville will be another great step forward. The long-term picture is indeed bright. A vigorous biomass economy – using a mix of warm season grasses, specialized fuel crops and woody biomass – will be able to support a wide range of potential industries and will have a distinct advantage over tobacco in that farmers and landowners could have very different buyers competing for their output.

To properly position the region we must capitalize on the short term potential for bio-power now. Southside and Southwest Virginia must catch up to other states in the region like North Carolina, Tennessee, and South Carolina. We can do this, as bio-power technology is tested, and the market demand is immediate especially for municipal power used by public authorities – school boards, county government, public hospitals, and the like. A community-scale bio-power facility would be sustainable, create local jobs, keep energy dollars close to home, contribute to the sustainable management of forests, protect our waterways, especially the Chesapeake Bay, and provide important wildlife habitat. Additionally, bio-power facilities utilizing combined heat and power technology can offer greater economic impact and increase generating to 90% or more, compared to about 30 to 45% for electricity from a central power station.

In a recent meeting the Assistant City Manager for Martinsville stated that the city would be very interested in developing a municipal bio-power facility if the financial model made sense. Grayson County, among others in Southwest Virginia, has expressed similar interest in bio-power projects. Public Policy Virginia through this project will partner with the David Reichert and his project Developing Community Scale Wood-to-Energy Projects in the Appalachian Hardwood Region of Virginia. Together we will provide the comprehensive information Martinsville and Grayson County need to develop medium and small scale bio-power facilities, respectively. We will do this by coordinating contractual services in three primary areas: feedstock assessment, technology analysis, and financial modeling. To develop this proposal and budget we have corresponded with potential contractors The Conservation Management Institute, The Antares Group, and The Southside Business Technology Center.

**Feedstock Assessment:** The 2008 study Resource Assessment of Biomass Feedstocks In Virginia For Bioenergy Production, “developed a database and methodology that can be used by economic development authorities to document the potential for growing a bioenergy feedstock in tobacco-producing counties.”<sup>i</sup> The study focused on areas surrounding Gretna and Keysville. The work on this study is extremely valuable, but does not address the willingness of farmers and landowners to grow and sell biomass feedstocks. The 2009 study Identifying Farmers' Interest in Growing Switchgrass for Bioenergy in Southern Virginia surveyed farmers across Southside to understand how many farmers would grow and sell biomass feedstocks, and what factors affect their decisions<sup>ii</sup>. This study is also extremely valuable, but does not address non-farming landowners. The Municipal Biomass Business Plan will combine the methodologies of these two studies, apply them in the context of a complete business plan, and include all landowners in the region in an effort to get a comprehensive picture of true feedstock availability.

**Technology Analysis:** Antares Group is an engineering consulting firm with an office in Harrisonburg, VA that is focused on helping private-sector and government clients increase their implementation of renewable energy and energy efficiency projects. Since the company’s inception in 1992, Antares has served in a lead role on numerous bioenergy projects with a national profile and significance. To facilitate good planning for growing Virginia’s biomass industry to add new sustainable jobs in rural parts of the state, Antares Group will use their experience and informational resources to provide credible technical and economic performance information for new biomass energy systems that have potential for near-term application in Virginia including a new stand-alone power plant of an estimated size of 15 to 25 MWe and a small boiler plant for steam production at a smaller facility. Only reliable, commercially-proven boiler and fuel feed systems with a long and successful operational track record will be considered. Antares will estimate installation and operating costs for each type of facility and will perform a preliminary proforma economic analysis for each type of facility to identify the circumstances under which each type of facility would be economically attractive to its host or customer. The economic analysis will be performed for existing and projected future market conditions (fuel prices, etc.), and will include consideration of new, pending or probable renewable energy incentives (green energy credits, renewable portfolio requirements, renewable energy tax credits, USDA agricultural program incentives, carbon credits, etc.). All economic analyses will be performed assuming delivered biomass fuel prices that are likely to be high enough to offer an attractive incentive for local biomass producers to supply biomass to the facilities under long-term contracts. The results for each facility will also include technical specifications for the equipment considered for the installation, estimates for annual biomass use, and estimates for other important impacts such as ash flows and air emissions.

**Financial Model:** Finally, a full financial picture will bring together the feedstock assessment and technology analysis into a clear business plan. One likely scenario could include a project that includes a pelletizing facility, taking advantage of the massive and growing market for American pellets in Europe. Using thermal energy created in electricity generation in the pelletizing process could increase in economic viability of the facility.

The business plan developed for a medium scale facility in Martinsville and a small scale facility, likely in Grayson County, could quickly lead to the development of at least one bio-power facility. Given annual usage of around 41 MW of electricity in Martinsville, a facility of around 20 MW would make sense there. A University of Florida study which projects the economic impact of biomass power plants

throughout the southern United States concluded that construction and operation of a 20 MW wood fired facility in Chesterfield, Virginia would create \$56.88 million in output, or sales revenues of all local businesses, 409 jobs, and \$29.94 million in value added to the community<sup>iii</sup>. These numbers can reasonably be applied to the potential economic impact of a plant in Martinsville, and such an impact would encourage other municipalities to follow.

Since 60% or so of all jobs created will occur in the agriculture and forestry sector, farmers and landowners in the tobacco regions will be able to capture a significant share of the market by producing energy crops. A recent study of the impact of renewable energy on the rural economy in neighboring North Carolina estimates increased income per farm between \$7,200 and \$16,000 per year<sup>iv</sup>. Biomass power will be the overwhelming source of that income to landowners. In southern Virginia, an economy based on sustainably harvested biomass could have the reach and prosperity once associated with tobacco.

In addition to our audience of municipal governments in the tobacco regions, utilities such as Old Dominion Electric Cooperative (ODEC) and Central Virginia Electric Cooperative (CVEC) have expressed interest in bio-power. Should Martinsville or Grayson County take the lead in the region and establish technological and feedstock supply precedents, it is likely that larger utilities would get involved in the biomass market, increasing income potential for feedstock producers.

Assuming that production of distributed biomass in Southside could reach at least 100 MW, the future economic impact would be great. At current prices, an investment of 1 MW of biomass energy capacity will generate at least \$300,000 in annual income, so 100 MW will generate about \$30 million. Further, a growing body of evidence suggests that every dollar spent at a locally owned business generates two to four times more economic benefit—measured in income, wealth, jobs, and tax revenue—than a dollar spent outside the region.

Additionally, a community based on local, secure, and affordable power will attract more investment and business development in other industries as well. In other words, a stable power supply that won't be disrupted by natural disasters or price spikes is an attractive commodity to expanding business shopping for new locations.

The level of implementation taken by the City of Martinsville and the Southwest locality will measure the success of this project. Given the letters of support currently being drafted by Martinsville and Grayson County, we are hopeful that the immediate return will come in the development, construction, and operation of at least one biomass power facility. This will only happen in the short term if a project like the Municipal Biomass Action Plan provides the information needed for project development.

<sup>i</sup> John Cundiff, Jonathan Resop, Spencer Riddle, John McGee, and Pat Donovan “Resource Assessment of Biomass Feedstocks in Virginia for Bioenergy Production” submitted to The Virginia Tobacco Indemnification and Community Revitalization Commission, June 30, 2008: 2

<sup>ii</sup> Zhyou Wen, John Ignosh, David Parrish, Jamie Stowe, and Bob Jones, “Identifying Farmers’ Interest in Growing Switchgrass for Bioenergy in Southern Virginia” *Journal of Extension* Oct. 2009: 2

<sup>iii</sup> Alan W. Hodges and Mohammad Rahmani “Economic Impacts of Generating Electricity” *Wood Energy Fact Sheets, University of Florida* Sept. 2007

<sup>iv</sup> Burton English, Kim Jensen, Jamey Menard, and Daniel De La Torre Ugarte “Projected Impacts of Proposed Federal Renewable Energy Portfolio Standards on the North Carolina Economy,” Bio-Based Energy Analysis Group, August, 2009: page iv.