

Economic and Technical Feasibility of Energy Production from Poultry Litter and Nutrient Filter Biomass on the Lower Delmarva Peninsula

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Poultry litter has been used as a fertilizer on the Delmarva Peninsula for many years. However the continuous application in areas of high concentration of poultry farms has resulted in higher than necessary concentrations of some nutrients in the soil. Nutrient-rich run-off from agricultural lands has been identified as a potential cause for outbreaks of *Pfiesteria* in the Chesapeake Bay and its tributaries. Proposed limitations on local land application of litter have created the need to develop other beneficial uses for a portion of the poultry litter generated on the Peninsula.

Energy production from poultry litter is one potentially beneficial use. Energy conversion can provide steam and electricity while providing a means of concentrating litter phosphorous and potassium in the form of ash that can be transported easily to other locations for use as fertilizer.

However the very elements that contribute to the fertilizer value of litter can also be “problem” constituents in any combustion process. The central issues for energy production are twofold:

- ▶ Can the “problem” constituents of poultry litter or switchgrass for energy production be managed or mitigated?
- ▶ Can poultry litter be economically utilized for energy production without adding new expenses for local poultry farmers?

This study examines these issues in detail, focusing on technologies that are either commercially available today or in the near future (if product demand exists). Various technical options for energy conversion have been analyzed and evaluated to determine which options offer the best potential for economic, efficient and environmentally sound production of energy. In addition to poultry litter, this study examines woody crops such as willow and herbaceous crops such as switchgrass which have been suggested as possible nutrient filter strips to protect the Chesapeake watershed. During this study, a survey of all major energy consumers on the lower Delmarva peninsula was conducted in order to identify the best potential opportunities for energy projects which would utilize poultry litter and/or nutrient filter biomass. Three case studies were performed to explore feasibility on a more site-specific bases.