SB0903_DNR_SUP_FIN_3-1-22.pdf
Uploaded by: Bunky Luffman
Position: FAV

MARYLAND
DEPARTMENT OF
NATURAL RESOURCES

Bill Number: Senate Bill 903

Short Title: Renewable Energy Portfolio Standard - Qualifying Biomass and Thermal Biomass Systems

Department's Position: Support

Explanation of Department's Position

Senate Bill 903 clarifies that certain forms of wood, food waste, and animal manure are individually eligible for thermal renewable energy credits under the Renewable Portfolio Standard (RPS) as authorized sources for thermal biomass systems, regardless of the relative mix. This will facilitate more options for renewable energy that support sustainable forestry practices while keeping a low carbon footprint. The current statute authorizes Thermal Renewable Energy Credits (TRECs) as Tier I credits for mill residue, precommercial soft wood thinning, slash, brush and yard waste, however it does not authorize the use of natural wood waste associated with forestry management. In the absence of this authorization, management of forests has slowed and natural wood waste is being sent to landfills.

The RPS acknowledges wood as a good choice for renewable thermal energy because it is an abundant, inexpensive, price-stable, clean, and locally purchased energy source. With currently available technology such as pyrolysis, facilities can save 40 to 70% on fuel costs. Pyrolysis is not incineration - it is energy derived from the decomposition of organic materials. Wood fuel is locally produced and locally sourced which means jobs and economic benefits are also local.

Wood is commonly 80-85% efficient for thermal uses, and governed by strict Maryland Department of Environment performance-based air quality regulations. Many other states have incorporated wood for thermal into their energy portfolios, motivated by keeping energy prices low and stable while accelerating their reductions of greenhouse gas emissions.[1] Recent analysis by the US Forest Service indicates that thermally led wood energy projects are a cost-effective greenhouse gas abatement option.[2]

Maryland's Greenhouse Gas Emissions Reduction Act Plan relies heavily on forest management and wood products as carbon sinks. Forests are the largest carbon sink in Maryland, and without

[1] https://www.cesa.org/wp-content/uploads/Renewable-Thermal-RPS.pdf Other states providing Thermal RECs for systems using wood fuels include: AZ, MA, ME, NC, NH, OR, VT, WA, WI.
[2] Carbon Benefits of Sustainably Sourced Wood Energy. October 2019. USDA Forest Service, Wood Education and Resource Center, Princeton, WV.

Contact: Bunky Luffman, Director, Legislative and Constituent Services
Bunky.luffman1@maryland.gov ♦ 410-689-9165

good forest management, forests can rapidly become a source rather than a sink.[3] The IPCC calls for accelerating forest management and markets for wood products to attain climate goals, and specifically encourages an increased use of wood energy to retain and expand forest area.[4]

The annual supply of wood residues in Maryland could support an estimated 1 million TRECs over time which equates to a small percentage of the total pool of RECs within the PJM region and would have little effect on REC pricing in the market. Conversely, the financial value of TRECs to an individual facility would be highly significant, and enable another option for renewable energy and carbon reduction.

For any additional information, please feel free to contact our Legislative and Constituent Services Director, Bunky Luffman.

[3] Maryland Greenhouse Gas Reduction Act: 2030 GGRA Plan. February 2021. p.110

[4] *Climate Change and Land. An IPCC Special Report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems.* August 2019. Intergovernmental Panel on Climate Change.

Support of SB 903 - Renewable Energy Portfolio Sta

Uploaded by: Colby Ferguson

Position: FAV

Maryland Farm Bureau, Inc.

3358 Davidsonville Road • Davidsonville, MD 21035 • (410) 922-3426

March 1, 2022

To: Senate Finance Committee

From: Maryland Farm Bureau, Inc.

Re: **Support of SB 903 - Renewable Energy Portfolio Standard - Qualifying Biomass and Thermal Biomass Systems**

On behalf of our member families, I submit this written testimony in support of SB 903, legislation that authorizes thermal biomass systems, for purposes of the State's Renewable Energy Portfolio Standard (RPS), to use food waste, qualifying biomass (including Silvicultural products and natural wood waste), or animal manure as a source of fuel, regardless of the relative mix of those fuel sources. Other eligibility requirements related to thermal biomass systems and their fuel components are unchanged.

As the state moves towards more and more renewable energy generation, utilizing biomass to generate energy not only utilizes waste products, but captures the methane uses it instead of just letting it go into the atmosphere. With many of the paper mills shutting down, the need for a new use of wood products is needed. Decoupling woody biomass from poultry litter will allow products around the state to be utilized more efficiently.

Maryland Farm Bureau Policy:

- We support energy generation from all agricultural residues and biproducts to be considered value-added production on a farm.

- We support initiatives to generate heat & electricity from timber resources.

MARYLAND FARM BUREAU SUPPORTS SB 903 AND REQUEST A FAVORABLE REPORT

Colby Ferguson
Director of Government Relations

For more information contact Colby Ferguson at (240) 578-0396

SB903 - Qualifying Biomass and Thermal Biomass Sy

Uploaded by: Dakota Matthews

Position: FAV

Rural Maryland Council
50 Harry S. Truman Parkway • Annapolis, MD 21401
Office: 410-841-5772 • Fax: 410-841-5987 • TTY: 800-735-2258
Email: rmc.mda@maryland.gov
Website: www.rural.maryland.gov
John Hartline, Chair *Charlotte Davis, Executive Director*

Testimony in Support of
Senate Bill 903 - Renewable Energy Portfolio Standard - Qualifying Biomass and Thermal Biomass Systems
Senate Finance Committee
March 01, 2022

The Rural Maryland Council supports Senate Bill 903 - Renewable Energy Portfolio Standard - Qualifying Biomass and Thermal Biomass Systems. The purpose of this bill is to authorize thermal biomass systems, for purposes of the State's Renewable Energy Portfolio Standard (RPS), to use food waste, qualifying biomass, or animal manure as a source of fuel, regardless of the relative mix of fuel sources.

This bill is asking for wood energy to be clearly decoupled from animal manure when applying to Thermal Renewable Energy Credits (TRECs). Wood energy is a small part of Maryland's current Renewable Energy Portfolio Standard (RPS) but provides significant benefits to the environment, reduces dependency on fossil fuels, and helps the local economy by investing in Maryland energy production and jobs. Additionally, it has been recognized by entities such as the U.S. Environmental Protection Agency and the Intergovernmental Panel on Climate Change as an immediate solution to decarbonize our fuel supply.

In 2015, the US Environmental Protection Agency and the US Department of Agriculture announced a national goal to reduce food waste by 50% by 2030. According to the Maryland Department of the Environment, over nine hundred thousand tons of food waste is generated annually and only a small portion is recycled with the majority being disposed in landfills or incinerated. Including food waste as a renewable fuel source can provide a significant contribution towards on farm energy use, revenue generation, and climate change mitigation. An example of this is a partnership between West Nottingham Academy and Kilby Farm Creamery located in Cecil County. In partnership, the school diverts nearly 7 tons of food waste annually from their dining hall to the farm digester where it becomes compost and energy to run the farm.

The Rural Maryland Council respectfully requests your favorable support of Senate Bill 903.

The Rural Maryland Council (RMC) is an independent state agency governed by a nonpartisan, 40-member board that consists of inclusive representation from the federal, state, regional, county and municipal governments, as well as the for-profit and nonprofit sectors. We bring together federal, state, county and municipal government officials as well as representatives of the for-profit and nonprofit sectors to identify challenges unique to rural communities and to craft public policy, programmatic or regulatory solutions.

SB0903_MAA_FAV.pdf
Uploaded by: Danielle Bauer Farace
Position: FAV

Maryland Arborist Association, Inc.
Danielle Bauer Farace
Executive Director

SB 0903 – Renewable Energy Portfolio Standard – Qualifying Biomass and Thermal Biomass Systems

Committee: Finance Date: March 1, 2022
MAA Position: **SUPPORT**

The Maryland Arborist Association, Inc. (MAA) works to promote the importance of proper tree care, education in the field of arboriculture, and support the accomplishments of arborists. We urge you to support SB903 – Renewable Energy Portfolio Standard – Qualifying Biomass and Thermal Biomass Systems. This bill is simply asking for wood energy to be clearly decoupled from animal manure when applying to Thermal Renewable Energy Credits (TRECs). Wood energy is a small part of Maryland's current Renewable Energy Portfolio Standard (RPS) but provides significant benefits to the environment, reduces dependency on fossil fuels, and helps the local economy by investing in Maryland energy production and jobs. Additionally, it has been recognized by entities such as the U.S. Environmental Protection Agency and the Intergovernmental Panel on Climate Change as an immediate solution to decarbonize our fuel supply.
Creating Thermal Renewable Energy Credits is crucial to renewable energy in Maryland because:

- Reach Environmental Goals: The 2030 Greenhouse Gas Emissions Reduction Act Plan (GGRA Plan) requires reducing GHG emissions by 50% before 2030. The GGRA Plan recommends replacing fossil fuel systems and deploying clean, renewable energy through the Renewable Energy Portfolio Standard such as Combined Heat and Power (CHP) systems and power plants that use qualifying biomass.
- Support Energy Independence: Currently, 75% of the energy consumed in Maryland is from fossil fuels, and 40% of its energy is imported. Wood residues are sourced locally from abundant forest and urban wood waste, competitively priced, and have similar efficiencies.
- Maintain and Improve Forest Stands: Sustainable active forest management practices on private land are encouraged by providing landowners market for low-value, small diameter wood waste from logging and thinning. In addition, it provides an economic incentive for landowners to not only participate in forest management but also to retain ownership and resist conversion to other uses.
- Increase Utilization: Residues used in wood energy systems are diverted from alternative methods of disposal that would have a far more significant impact on the environment,

such as landfilling, which releases methane, or open burning, which has the same emissions as bioenergy but without filters or carbon capture technology.

- Develop a Resilient System: Wood energy is the most efficient in thermal applications and can be accessed on demand. These qualities complement other forms of renewable energy, such as solar and wind, which are the most efficient at generating electricity and have intermittent access.
- Invest in Maryland: Creating TRECs for wood energy would achieve immediate legislative actions recommended by the 2021 Maryland Forestry Economic Adjustment Strategy and the 2022 Task Force on the Economic Future of Western Maryland.

With the closure of sawmills, specifically in Western Maryland and the Eastern Shore, arborists have had to find alternative disposal avenues, such as landfills, to dispose of brush and wood waste. Passage of this bill will create a sustainable market for the byproducts of tree care work.

Sincerely,

Danielle Bauer Farace
Executive Director

7151 Hubbard Road, Federalsburg, MD 21632
410-928-4888 ● office@mdarborist.com ● www.mdarborist.com

AFPA Letter on SB 903 final 3-1-2022.pdf
Uploaded by: Elizabeth Olds
Position: FAV

American Forest & Paper Association

LEGISLATIVE POSITION: FAVORABLE
Senate Bill 903
Renewable Energy Portfolio Standard - Qualifying Biomass and Thermal Biomass Systems
Senate Finance Committee
March 1, 2022

The Honorable Delores Kelley, Chair, Senate Finance Committee
The Honorable Brian Feldman, Vice Chair, Senate Finance Committee

Dear Chair Kelley, Vice Chair Feldman, and Members of the Committee:

The American Forest & Paper Association[1] (AF&PA) appreciates the opportunity to share our perspective on Senate Bill 903 on behalf of our members and their employees who are an integral part of the circular economy. In Maryland the forest products industry employs nearly 6,000 individuals in facilities that produce packaging, sales displays, corrugated boxes and other products with an annual payroll of over $374 million.[2]

Through the highly efficient use of biomass residuals of the forest products manufacturing process, AF&PA members generate renewable bioenergy and have improved their energy efficiency and reduced fossil fuel use and greenhouse gas (GHG) emissions by 23.3 percent since 2005. Bioenergy from forest products manufacturing residuals provides large GHG reduction benefits – roughly equivalent to removing 35 million cars from the road. SB 903 allows forest products to remain in the definition of qualifying biomass and enables these clean technologies to qualify as a Tier 1 renewable source. Accordingly, AF&PA encourages the Committee to give SB 903 a favorable report.

AF&PA Members Generate Renewable Energy While Reducing GHG Emissions

The forest products industry produces and uses renewable energy for manufacturing operations and is a significant contributor to our country's existing base of renewable energy. On average, approximately two-thirds of the energy used at AF&PA member pulp and paper mills is generated from carbon-neutral biomass.

The industry also strives to use all types of energy as efficiently as possible. The industry is a leader in the use of combined heat and power (CHP) technology, which is extremely efficient because it uses the

[1] The American Forest & Paper Association (AF&PA) serves to advance U.S. paper and wood products manufacturers through fact-based public policy and marketplace advocacy. The forest products industry is circular by nature. AF&PA member companies make essential products from renewable and recycle resources, generate renewable bioenergy and are committed to continuous improvement through the industry's sustainability initiative — *Better Practices, Better Planet 2030: Sustainable Products for a Sustainable Future.* The forest products industry accounts for approximately four percent of the total U.S. manufacturing GDP, manufactures nearly $300 billion in products annually and employs approximately 950,000 people. The industry meets a payroll of approximately $60 billion annually and is among the top 10 manufacturing sector employers in 45 states.

[2] Data sources: U.S. government, AF&PA, and RISI. Figures are the most recent available as of December 2020.

same fuel to produce both thermal energy used in the manufacturing process as well as electricity, some used on-site and some sold to the grid. In 2018, over 98 percent of electricity produced by the industry was CHP-generated. The use of CHP provides energy efficiencies in the range of 50 to 80 percent at forest products mills, far beyond non-CHP electrical stations such as utilities, which are only about 33 percent energy efficient.

Our commitments to renewable biomass energy and energy efficiency, including our extensive use of CHP, have led to a major decrease in the sector's use of fossil fuel and GHG emissions. Energy purchased by member pulp and paper mills has decreased dramatically. In 2018, AF&PA member GHG emissions were 23.2 percent less than the 2005 baseline year, surpassing our new 2020 goal of 20 percent reductions.

The forest products industry has played an important role in helping Maryland and the nation meet their renewable energy objectives. SB 903 will help ensure our ability to continue using clean bioenergies, displace fossil fuels, and reduce greenhouse gas emissions in a highly sustainable manner. We request that the Committee give this bill a favorable report.

We look forward to continuing our work with the State of Maryland. Please feel free to contact Elizabeth Olds, Government Affairs Manager, AF&PA at Elizabeth_Olds@afandpa.org for further information.

Thank you.

/s/
Elizabeth Olds
Manager, Government Affairs
Elizabeth_Olds@afandpa.org
American Forest & Paper Association

SB903_Letter GA Finance 3-1-22.pdf
Uploaded by: gary allen
Position: FAV

February 28,2022
To: Senate Finance Committee
From: *Gary Allen, President, Maryland Forestry Foundation*
Re: Support of SB903 – Renewable Energy Portfolio Standard – Qualifying Biomass and Thermal Biomass Systems

The Maryland Forestry Foundation strongly urging you to support SB903 – Renewable Energy Portfolio Standard – Qualifying Biomass and Thermal Biomass Systems. This bill is simply asking for wood energy to be clearly decoupled from animal manure when applying to Thermal Renewable Energy Credits (TRECs). Wood energy is a small part of Maryland's current Renewable Energy Portfolio Standard (RPS) but provides significant benefits to the environment, reduces dependency on fossil fuels, and helps the local economy by investing in Maryland energy production and jobs. Additionally, it has been recognized by entities such as the U.S. Environmental Protection Agency and the Intergovernmental Panel on Climate Change as an immediate solution to decarbonize our fuel supply.

Creating Thermal Renewable Energy Credits is crucial to renewable energy in Maryland because:

- Reach Environmental Goals: The 2030 Greenhouse Gas Emissions Reduction Act Plan (GGRA Plan) requires reducing GHG emissions by 50% before 2030. The GGRA Plan recommends replacing fossil fuel systems and deploying clean, renewable energy through the Renewable Energy Portfolio Standard such as Combined Heat and Power (CHP) systems and power plants that use qualifying biomass.
- Support Energy Independence: Currently, 75% of the energy consumed in Maryland is from fossil fuels, and 40% of its energy is imported. Wood residues are sourced locally from abundant forest and urban wood waste, competitively priced, and have similar efficiencies.
- Maintain and Improve Forest Stands: Sustainable active forest management practices on private land are encouraged by providing landowners market for low-value, small diameter wood waste from logging and thinning. In addition, it provides an economic incentive for landowners to not only participate in forest management but also to retain ownership and resist conversion to other uses.
- Increase Utilization: Residues used in wood energy systems are diverted from alternative methods of disposal that would have a far more significant impact on the environment, such as landfilling, which releases methane, or open burning, which has the same emissions as bioenergy but without filters or carbon capture technology.
- Develop a Resilient System: Wood energy is the most efficient in thermal applications and can be accessed on demand. These qualities complement other forms of renewable energy, such as solar and wind, which are the most efficient at generating electricity and have intermittent access.
- Invest in Maryland: Creating TRECs for wood energy would achieve immediate legislative actions recommended by the 2021 Maryland Forestry Economic Adjustment Strategy and the 2022 Task Force on the Economic Future of Western Maryland.

We trust you will support the need to broaden the incentives already available to make wood energy part of Maryland energy future. Our Partners a are already planning and seeking to identify projects where such incentives can make a significance difference in providing alternatives to fossil fuel use and local supply chains are in place. Support this work!

Sincerely,

Gary G Allen,

President, Maryland Forestry Foundation

SB903_TGCC_fav.pdf
Uploaded by: Jennifer Walsh
Position: FAV

THE GREATER CUMBERLAND COMMITTEE
ONE REGION · ONE VISION · ONE FUTURE
208 N. Centre St, Cumberland, MD 21502 301-722-0090

Date: February 28, 2022
To: Senate Finance Committee
From: Jennifer Walsh, Executive Director, TGCC
Re: Support of SB903 – Renewable Energy Portfolio Standard – Qualifying Biomass and Thermal Biomass Systems

TGCC, a regional non-profit organization representing more than 100 leaders from the business, non-profit, educational and civic sectors, urges you to support SB903 – Renewable Energy Portfolio Standard – Qualifying Biomass and Thermal Biomass Systems. This bill is simply asking for wood energy to be clearly decoupled from animal manure when applying to Thermal Renewable Energy Credits (TRECs). Wood energy is a small part of Maryland's current Renewable Energy Portfolio Standard (RPS) but provides significant benefits to the environment, reduces dependency on fossil fuels, and helps the local economy by investing in Maryland energy production and jobs. Additionally, it has been recognized by entities such as the U.S. Environmental Protection Agency and the Intergovernmental Panel on Climate Change as an immediate solution to decarbonize our fuel supply.

Creating Thermal Renewable Energy Credits is crucial to renewable energy in Maryland because:

- Reach Environmental Goals: The 2030 Greenhouse Gas Emissions Reduction Act Plan (GGRA Plan) requires reducing GHG emissions by 50% before 2030. The GGRA Plan recommends replacing fossil fuel systems and deploying clean, renewable energy through the Renewable Energy Portfolio Standard such as Combined Heat and Power (CHP) systems and power plants that use qualifying biomass.
- Support Energy Independence: Currently, 75% of the energy consumed in Maryland is from fossil fuels, and 40% of its energy is imported. Wood residues are sourced locally from abundant forest and urban wood waste, competitively priced, and have similar efficiencies.
- Maintain and Improve Forest Stands: Sustainable active forest management practices on private land are encouraged by providing landowners market for low-value, small

diameter wood waste from logging and thinning. In addition, it provides an economic incentive for landowners to not only participate in forest management but also to retain ownership and resist conversion to other uses.

- Increase Utilization: Residues used in wood energy systems are diverted from alternative methods of disposal that would have a far more significant impact on the environment, such as landfilling, which releases methane, or open burning, which has the same emissions as bioenergy but without filters or carbon capture technology.
- Develop a Resilient System: Wood energy is the most efficient in thermal applications and can be accessed on demand. These qualities complement other forms of renewable energy, such as solar and wind, which are the most efficient at generating electricity and have intermittent access.
- Invest in Maryland: Creating TRECs for wood energy would achieve immediate legislative actions recommended by the 2021 Maryland Forestry Economic Adjustment Strategy and the 2022 Task Force on the Economic Future of Western Maryland.

Please let me know if you need any further information to evaluate this request. We very much appreciate your time and effort.

Sincerely,

Jennifer Walsh, Esq.
Executive Director

Hinson Support for SB 903.pdf
Uploaded by: Joe Hinson
Position: FAV

Statement of

Joseph M. Hinson, Maryland Licensed Forester #765

In Support of SB 903

I'm a consulting forester, located in Salisbury, and I work for forest products companies that qualify for and would take advantage of biomass thermal renewable energy credits (TRECs).

To date, no one has applied for TRECs in Maryland, to the best of my knowledge. The law can be interpreted as allowing the credits for only those biomass systems that burn a combination of animal manure and qualified biomass. No such system exists and, in the real world, a biomass system that uses such a combination for fuel is extremely unlikely.

Nevertheless, this definition in the law appears to be a barrier to TREC applications from companies who qualify for the credits. SB 903 removes any ambiguity in the statute and provides a clear path to gain access to the credits.

There are important, environmentally positive effects from the availability of TRECs. Many, probably most, sawmills and other forest product manufacturers already burn bark, chipped up tops and limbs, small low value trees and waste wood to generate heat and, in some cases, steam for their operations. The units that do the burning are high tech, with complex capture and re-burn mechanisms to reduce any pollutant discharges. They are not simply open fires and they operate in strict compliance with state air quality permits and regulations.

The value of TRECs changes the economics of the fuel stream for these systems by making it financially feasible to use additional sources of waste wood like the urban wood waste that is piling up in the greater Baltimore area. For example, the added value of TRECs makes it feasible for mills on the Eastern Shore to process and transport urban wood waste from Baltimore to be converted to energy or wood pellets. This wood includes trees removed or trimmed by tree care companies or that which results from storm damage. Another source of wood is the huge volume of wooden pallets that are beyond their useful life. Without the added value of TRECs, this wood remains unavailable and ultimately finds its way into landfills.

This is an important piece of clarifying legislation that will pave the way for more efficient and economical uses for waste wood. I urge the Committee's favorable report.

Testimony in SUPPORT of SB0903.pdf
Uploaded by: Joseph Jankowski
Position: FAV

Testimony in SUPPORT of SB0903 – Renewable Energy Portfolio Standard
Qualifying Biomass and Thermal Biomass Systems

Dear Chair Kelley and members of the Finance Committee,

I support SB0903.

The Eastern Shore of Maryland will be subject to sea level rise before most of the area of the United States due to human induced climate change. This bill proposes actions in which Maryland will reduce it's subsidizing of technologies that produce greenhouse gas emissions, which are a major cause of human induce climate change.

My waterfront home is located on coastal bays of the Eastern Shore of Maryland. My home's existence and value are threatened by rising sea levels. Action is required by my state legislators to protect me and my family from future harm, which has been clearly identified by U.S. scientists.

Respectfully,

Joseph Jankowski
Berlin, Maryland 21811

SB0903_SupportLetter_2.22.pdf
Uploaded by: Juli McCoy
Position: FAV

The CHAMBER
ALLEGANY COUNTY, MD

The Bell Tower Building
24 Frederick Street | Cumberland, MD 21502
p: 301-722-2820 | f: 301-722-5995
info@alleganycountychamber.com | www.alleganycountychamber.com

February 28, 2022

The Honorable Delores G. Kelley
Senate Finance Committee
3 East, Miller Senate Office Building
Annapolis, Maryland 21401

Re: SB0903 –Renewable Energy Portfolio Standard – Qualifying Biomass and Thermal Biomass Systems

Dear Chairwoman Kelley:

The Allegany County Chamber of Commerce respectfully urges your support or SB0903 – Renewable Energy Portfolio Standard – Qualifying Biomass and Thermal Biomass Systems. This bill is simply asking for wood energy to be clearly decoupled from animal manure when applying to Thermal Renewable Energy Credits (TRECs). Wood energy is a small part of Maryland's current Renewable Energy Portfolio Standard (RPS) but provides significant benefits to the environment, reduces dependency on fossil fuels, and helps the local economy by investing in Maryland energy production and jobs. Additionally, it has been recognized by entities such as the U.S. Environmental Protection Agency and the Intergovernmental Panel on Climate Change as an immediate solution to decarbonize our fuel supply.

Creating Thermal Renewable Energy Credits is crucial to renewable energy in Maryland because:

- Reach Environmental Goals: The 2030 Greenhouse Gas Emissions Reduction Act Plan (GGRA Plan) requires reducing GHG emissions by 50% before 2030. The GGRA Plan recommends replacing fossil fuel systems and deploying clean, renewable energy through the Renewable Energy Portfolio Standard such as Combined Heat and Power (CHP) systems and power plants that use qualifying biomass.
- Support Energy Independence: Currently, 75% of the energy consumed in Maryland is from fossil fuels, and 40% of its energy is imported. Wood residues are sourced locally from abundant forest and urban wood waste, competitively priced, and have similar efficiencies.
- Maintain and Improve Forest Stands: Sustainable active forest management practices on private land are encouraged by providing landowners market for low-value, small diameter wood waste from logging and thinning. In addition, it provides an economic incentive for landowners to not only participate in forest management but also to retain ownership and resist conversion to other uses.
- Increase Utilization: Residues used in wood energy systems are diverted from alternative methods of disposal that would have a far more significant impact on the environment, such as landfilling, which releases methane, or open burning, which has the same emissions as bioenergy but without filters or carbon capture technology.
- Develop a Resilient System: Wood energy is the most efficient in thermal applications and can be accessed on demand. These qualities complement other forms of renewable energy, such as solar and wind, which are the most efficient at generating electricity and have intermittent access.

- Invest in Maryland: Creating TRECs for wood energy would achieve immediate legislative actions recommended by the 2021 Maryland Forestry Economic Adjustment Strategy and the 2022 Task Force on the Economic Future of Western Maryland.

Thank you for considering a **favorable report for SB0903**.

Sincerely,

Jeremy G. Irons
Legislative Committee Chair

Juli R. McCoy
Executive Director

cc: Honorable Brian J. Feldman, Vice Chair, Senate Finance Committee
Senate Finance Committee Members
Allegany County Delegation

SB0903 (HB1085) - Renewable Energy Portfolio Stand

Uploaded by: Landon Fahrig

Position: FAV

Maryland Energy Administration

Larry Hogan, Governor
Boyd K. Rutherford, Lt. Governor
Mary Beth Tung, Director

TO: Members, Senate Finance Committee
FROM: Mary Beth Tung – Director, MEA
SUBJECT: SB 903 (HB 1085) - Renewable Energy Portfolio Standard - Qualifying Biomass and Thermal Biomass Systems
DATE: March 1, 2021

MEA POSITION: FAV

MEA views the expansion of thermal biomass within the Renewable Portfolio Standard (RPS) favorably, and this bill will make more renewable energy projects economically viable.

The bill will have an overall small-scale impact on the RPS. In other words, this will not derail current technology-specific statutory goals. In fact, "[t]here are currently no thermal biomass facilities in Maryland"[1], and, "contributions from qualifying biomass sourced from agricultural crops, geothermal, other biomass liquid and gas, and solar thermal are too small to [register in comparison to other Tier 1 sources]".[2]

The use of biomass as feedstock for onsite thermal generation is highly efficient. Pipeline-grade renewable natural gas (RNG) utilized to generate electricity for grid export results in a fuel use efficiency of approximately 33% when line losses from electricity transmission and distribution are taken into account[3]. This means that nearly two-thirds of the energy content of RNG utilized in this manner is wasted to the environment, versus the much more efficient option of successfully capturing and utilizing this renewable energy resource to offset onsite thermal demand.

Altering the definitions of "qualifying biomass" and "thermal biomass system" will create greater potential for the adoption of clean and renewable energy in a larger geographic portion of the state.

For these reasons, MEA urges a **FAVORABLE** report for SB 903.

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[1] PSC 2020 RPS Report, 3.
[2] *Id.* at 13.
[3] epa.gov/chp/chp-benefits

SB903_Letter (SMADC).pdf
Uploaded by: Shelby Watson-Hampton
Position: FAV

February 28th, 2022

To: Senate Finance Committee
From: The Southern Maryland Agricultural Development Commission (SMADC)
Re: Support of SB903 – Renewable Energy Portfolio Standard – Qualifying Biomass and Thermal Biomass Systems

As Director of the Southern Maryland Agricultural Development Commission (SMADC), a division of the Tri-County Council for Southern Maryland, I am urging you to support SB903 – Renewable Energy Portfolio Standard – Qualifying Biomass and Thermal Biomass Systems.

The forestry industry is key to the Maryland economy. Forestry grows food and fiber, creates hundreds of products and materials, supports the environment, and builds careers. Nearly 40% of Maryland is forested. As the single largest land use in the state, forests are vital to the health of the Chesapeake Bay and offer numerous environmental and economic benefits.

This bill is simply asking for wood energy to be clearly decoupled from animal manure when applying to Thermal Renewable Energy Credits (TRECs). Wood energy is a small part of Maryland's current Renewable Energy Portfolio Standard (RPS) but provides significant benefits to the environment, reduces dependency on fossil fuels, and helps the local economy by investing in Maryland energy production and jobs. Additionally, it has been recognized by entities such as the U.S. Environmental Protection Agency and the Intergovernmental Panel on Climate Change as an immediate solution to decarbonize our fuel supply.

Creating Thermal Renewable Energy Credits is crucial to renewable energy in Maryland for several reasons:

It supports energy independence. Currently, 75% of the energy consumed in Maryland is from fossil fuels, and 40% of its energy is imported. Wood residues are sourced locally from abundant forest and urban wood waste, competitively priced, and have similar efficiencies.

It assists in maintaining and improving local forest stands, as sustainable active forest management practices on private land are encouraged by providing landowners market for low-value, small diameter wood waste from logging and thinning. In addition, it provides an economic incentive for landowners to not only participate in forest management but also to retain ownership and resist conversion to other uses.

In 2017, the statewide forestry industry directly contributed about $4.2 billion and supported 18,046 jobs in the Maryland economy. In Southern Maryland, forestry businesses contribute over $585 million to the state economy, supporting more than 3,000 jobs. Forests provide much-needed employment and economic sustainability for our rural communities, additionally many climate experts believe that a responsibly managed forest offers one of the best and least expensive ways to mitigate climate change by sequestering carbon and using carbon-neutral renewable energy. Forests also provide a viable timber market, incentivizing landowners to retain and care for their trees ensuring the overall health of their forests and habitat for wildlife.

Wood energy is the most efficient in thermal applications and can be accessed on demand. These qualities complement other forms of renewable energy, such as solar and wind, which are the most efficient at generating electricity and have intermittent access.

Therefore, we support SB903 – Renewable Energy Portfolio Standard – Qualifying Biomass and Thermal Biomass Systems.

Sincerely,

Shelby Watson-Hampton

Shelby Watson-Hampton
Director, Southern Maryland Agricultural
Development Commission (SMADC)

The Southern Maryland Agricultural Development Commission
is a division of the Tri-County Council for Southern Maryland
P.O. Box 745 Hughesville, MD 20637
Phone - 240-528-8850 ~ Email – info@smadc.com

Forestry's Support for Thermal Biomass Bill FINAL

Uploaded by: william miles

Position: FAV

ASSOCIATION OF FOREST INDUSTRIES, INC.
P.O. Box 501
Huntingtown, Maryland 20639

SUPPORT FOR SENTE BILL 903

RENEWABLE ENERGY PORTFOLIO STANDARD – QUAIFYING BIOMASS & THERMAL BIOMASS SYSTEMS
March 1, 2022

The Maryland Forests Association and the Association of Forest Industries – Maryland's two leading voices for the forest products industry, inclusive of landowners, sawmills, loggers, consultants, and primary/secondary manufacturers – support Senate Bill 903 as recommended by the Task Force on the Economic Future of Western Maryland (January 6, 2022).

The intent of the Act is to help promote thermal biomass energy which, as currently defined in the RPS statute, has not influenced a responsive market b/c of the restriction that a thermal biomass system be fueled "primarily" with "animal manure" instead of "qualifying biomass" as a stand-alone fuel source. Enactment creates an RPS economic level playing field consistent with and responsive to NR §5–102.

Sustainable managed forests are unrivaled in their capacity to remove harmful airborne particulate matter, and filter harmful runoff sediment and nutrients – P and N – from entering Maryland's watershed. It is for this reason, et al, Maryland lawmakers enacted the nationally acclaimed ***Sustainable Forestry Act of 2009***. This Act makes clear that not only is forestry Maryland's preferred land use – nexus between healthy forests and watershed -- but that biomass energy development is critical to the State's compliance with its green-energy-mandated-goals.

Since enactment of "primarily" by the 2012 General Assembly, there have been no market responses for thermal biomass systems deemed ideal for schools, hospitals, and prisons. Deleting "primarily" from §7-701 will remove this market barrier. Ideally, the first benefactor will be a project in Western Maryland. Further evidence is reflected via DNR's February 18, 2021, testimony on Senate Bill 549, aka, predecessor of Senate Bill 903:

> **"Woody biomass is a preferable choice for renewable thermal energy because it is abundant, inexpensive, price stable, clean, sustainable, and locally-procured + low-cost energy source that is an economic alternative to high-cost and high-emission fossil fuels…unlike fossil fuels, wood represents a carbon-neutral source of energy…the department estimates 500,000 tons of wood resides are annually produced in Maryland (not utilized from routine activities and manufacturing, roadside and utility tree maintenance and timber harvest)…every 100,000 tons of wood residues used for energy creates 40 jobs…switching out just 20% of commercial/industrial fuel consumption from oil to wood would inject $7 million annually into local economies, simultaneously preventing the export of $14 million from our economy."**

Beth Hill
Maryland Forests Association
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Bill Miles
Association of Forest Industries
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443/404-7449

CBR 2022 Fact Sheet.pdf
Uploaded by: Courtney Spangler
Position: FWA

726 Second Street, Suite 3B
Annapolis, MD 21403
info@cleanbayrenewables.com
410.514.6488

Maryland's Clean Energy Future

To effectively address environmental challenges now, Maryland's Renewable Energy Portfolio Standard needs to include diverse solutions and resources that can start working together today and affect measurable change quickly.

CleanBay Renewables' proprietary anaerobic digestion technology is one such solution. Using anaerobic digestion to recycle poultry litter presents Maryland with the opportunity to divert an abundant byproduct of local farms, create the sustainable clean energy the state needs and improve the health of local air, soil and water.

Why Poultry Litter?

The 605 million broiler chickens raised in the Delmarva alone produce 14 million tons of litter.

Uncontrolled poultry litter releases nitrous oxide, a greenhouse gas with 300 times the impact of CO_2.

Uncontrolled poultry litter produces nitrogen and phosphorus runoff, which lead to algae blooms that pollute our waterways.

Today, over 15,000 bodies of water in the U.S. are affected, including the Chesapeake Bay.

Why CleanBay Renewables?

CleanBay's process is unique, and its benefits are quite complex. Each full capacity facility can recycle more than 150,000 tons of chicken litter annually. By repurposing a potential source of excess nutrients, CleanBay can:

- Generate more than **750,000 MMBTu of sustainable renewable natural gas** – the amount of energy used by approximately 11,000 homes each year.
- Produce more than **100,000 tons of natural, controlled-release fertilizer** with humic acid – providing farmers with an alternative use for their byproducts while diverting pollutants like phosphorous and nitrogen as well as harmful pathogens from the soil and local waterways.
- Reduce greenhouse gas emissions by up to **1,000,000 tons of CO_2e** annually – equivalent to taking 217,480 passenger vehicles off the road each year.

CleanBay's proprietary process has also solved the issues that plague other forms of biomass anaerobic digestion (AD) solutions. All of the water used throughout CleanBay's process is fully recycled into the plant, and the materials that remain from the energy creation process, called digestate, are converted to a natural fertilizer product that stabilizes key nutrients. And, unlike other waste-to-energy, incineration or gasification climate solutions, CleanBay has created a biological, thermal process that essentially replicate's a cow's digestive system.

CleanBay Renewables Overview .pdf
Uploaded by: Courtney Spangler
Position: FWA

Protecting Nature. Supporting Agriculture. Energizing Our Future.

Sustainable management of waste is one of the **most significant challenges facing farming and food processing operations.**

At CleanBay Renewables Inc. we are developing a portfolio of utility-scale bioconversion facilities that use field-proven anaerobic digestion and nutrient recovery technologies to convert poultry litter into renewable natural gas (RNG) and controlled-release fertilizer. The company's first bioconversion facility will be located in Maryland. CleanBay is actively developing sites for future facilities on the Delmarva Peninsula, the Southeast, and California.

Nitrogen and phosphorus runoff

- More than **14 million tons of poultry litter** are produced in the U.S. each year.
- Uncontrolled poultry litter can release **nitrous oxide**, a greenhouse gas with **300 times the impact of carbon dioxide (CO_2).**
- Poultry litter contains **nitrogen and phosphorous**, which, if uncontrolled, **can pollute waterways and ground water.**

CleanBay's powerful solution to **reduce air, soil, and water pollution** is sustained by a **robust economic model:**

AIR QUALITY:

Reducing greenhouse gas emissions by 1,000,000 tons of CO_2 per full scale facility annually—equivalent to taking 217,480 passenger vehicles off the road each year.

PRIVATE INVESTMENT:

Increasing local and state tax bases through capital investment of over $500 million per full scale facility.

ECONOMIC DEVELOPMENT:

Creating **26 new high-paying full-time jobs** per facility, in addition to **hundreds of indirect jobs** in construction and supply-chain needs.

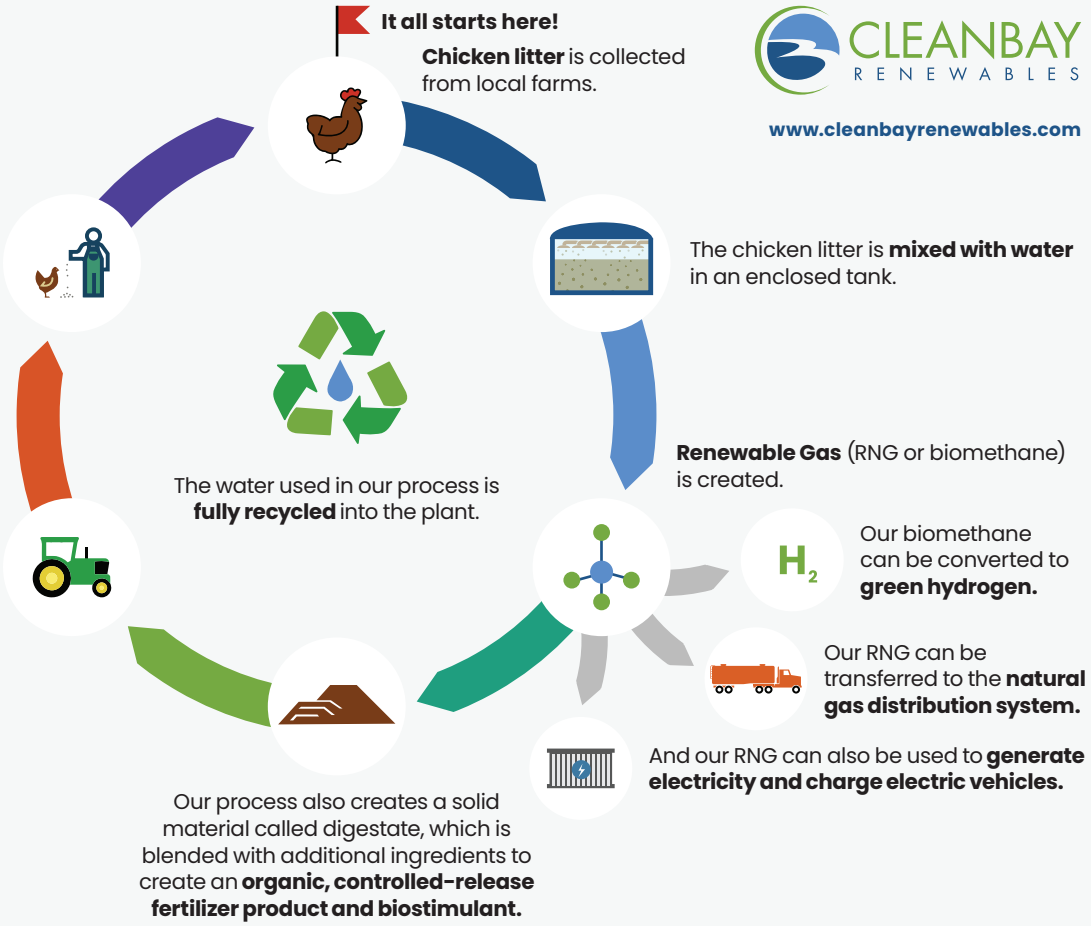
AGRICULTURE:

Enhancing farming and food operations' **environmental efforts** by providing a sustainable, circular solution for its byproducts.

OUR PROCESS

CLEANBAY RENEWABLES

www.cleanbayrenewables.com



We're solving **pressing environmental problems...**

- Farmers across the U.S. need an **economical and environmentally friendly way to dispose of the over 14 million tons of chicken litter** produced in the U.S. each year.
- Farmers need to **improve their soil health to fuel an increase in production** for an expanded population.
- Communities need an **economic boost** and want access to an **abundant, renewable energy supply.**

...While helping **farmers, local communities, and businesses.**

- Carbon pricing is increasingly recognized as an essential way to cost-effectively **transition to low-carbon economies**.
- **The world's carbon credit market is rapidly expanding** as states', companies', and countries' compliance targets must be met.
- As consumers pivot to organic foods, **demand for natural fertilizer is experiencing high growth**.

At full capacity, each facility can **recycle more than 150,000 tons of poultry litter** each year into:

750,000 MMBTu OF RNG

Providing the community with enough **renewable energy** for over 11,000 homes.

1,000,000 TONS OF CO_2 EQUIVALENT

Providing the state and businesses with new ways to **meet environmental regulations and low-carbon fuel standards.**

100,000 TONS OF FERTILIZER

Providing farmers with a controlled-release fertilizer with humic acid to **address overall soil health** and **relieve** nitrate and phosphorus **runoff.**

SB 903_CleanBay Renewables_FWA.pdf
Uploaded by: Courtney Spangler
Position: FWA

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February 25, 2022

The Hon. Chairman Delores Kelley
The Hon. Vice Chair Brian Feldman
The Hon. Steve Hershey
Senate Finance Committee
3 East, Miller Senate Office Building
Annapolis, MD 21401

Re: Senate Bill 903 – Favorable with Amendment to Definition of Thermal Biomass System

Dear Chairwoman Kelley, Vice Chair Feldman, and Senator Hershey:

I am writing in support of Senate Bill 903 with an amendment to the definition of a "thermal biomass system" to be included in our State's Renewable Energy Portfolio Standard (RPS). This bill makes a small but important change to current law so that food waste, animal manure including poultry litter, and qualified biomass are de-linked rather than requiring they be blended. The bill will allow each source of feedstock individually to be used to fuel a thermal biomass system and be eligible to participate in the Renewable Energy Credit (REC) market.

Please consider an amendment to the Annotated Code of Maryland Public Utilities Article, Section 7-701(r)(2) to read, "(2) is used in the State **OR IS CONNECTED WITH THE DISTRIBUTION INFRASTRUCTURE SERVING THE STATE**; and". This would add clarity and consistency with existing language in Public Utilities Article, Section 7-704(a)(2) which states, "Energy from a Tier 1 renewable source under §7-701(s)(1), (5), (9), (10), or (11) of this subtitle is eligible for inclusion in meeting the renewable energy portfolio standard only if the source is connected with the electric distribution grid serving Maryland."

The Fiscal and Policy Note for SB 903 makes the point in its Small Business Effect section that, "as of 2020, there were no thermal biomass systems in Maryland. However, the bill may lead to the construction, operation, and eventual supply chain support of such facilities by small businesses." In preparation for our business to become operational here in Maryland, language in this bill should reference our State's natural gas distribution system. This is akin to our electric distribution system that is referenced for eligible Tier 1 renewable sources to feed into the PJM Interconnection grid. Our state and region are making significant investments to expand natural gas infrastructure to serve the needs of area customers, and changes to SB 903 will track with this infrastructure modernization in an important way.

There is an opportunity in this legislation to promote in-state economic development by incentivizing renewable energy companies to locate and grow in Maryland. We ask that renewable energy diversity remain viable, and that any legislation working to incentivize more renewable energy projects and expand the market for renewable energy credits include qualifying biomass, poultry litter-to-energy, and thermal energy from biomass. Renewable energy diversity is what is needed as we transition away from fossil fuels toward net-zero carbon goals.

CleanBay Renewables implements anaerobic digestion and nutrient recovery technologies to recycle poultry litter and create renewable energy at utility scale. To effectively address environmental challenges now, Maryland's RPS needs to include diverse solutions and resources that can start working together today and affect measurable change quickly. Our technology presents Maryland with the opportunity to divert an abundant biproduct of local farms, create the sustainable

and baseload clean energy our state needs, and improve the health of local air, soil, and water. We also create a natural fertilizer that can replace synthetic fertilizers here and throughout the Chesapeake Bay watershed.

At full capacity, each CleanBay facility can recycle more than 150,000 tons of poultry litter each year and generate 750,000 MMBTU of sustainable renewable natural gas, the amount of energy used by about 11,000 homes each year; reduce greenhouse gas emissions by up to 1,000,000 tons of CO2 equivalent which is comparable to taking more than 200,000 passenger cars off the road each year, while providing our state and businesses with new ways to meet environmental regulations and low-carbon fuel standards; and produce 100,000 tons of organic, controlled-release fertilizer with added humic acid to address overall soil health and relieve nitrate and phosphorous runoff.

We are grateful for your ongoing validation of alternative renewable energy sources and your recognition that our state's agricultural sector can contribute to our renewable energy mix. We support the fact that SB 903 could incentivize more diverse thermal biomass systems to locate in Maryland and generate renewable energy and RECs that can be used and retired here.

The certainty of a tradable REC commodity will help attract commercial financing which is difficult to secure for rural economic development purposes in general, and especially for new types of agricultural businesses including capital intensive renewable energy projects. RECs derived from the agricultural sector can help drive market dollars and speed access to capital to areas where traditional financing is scarce. Our type of renewable energy facility at utility scale can cost over $500 million to develop, will employ more than 25 full-time employees with quality, high paying jobs; and includes more than 200 construction jobs for about 18 months of site work which means area economies can be impacted in a meaningful way.

We look forward to working with you to be certain that agriculture, environment, and business interests are heard and reflected in upcoming legislation. Thank you for your leadership bringing SB 903 to a vote. Please consider our favorable amendment to SB 903 to clarify that a thermal biomass system is one that is either used in state or **is connected with the distribution infrastructure serving Maryland**.

Sincerely,

Thomas Spangler
Executive Chairman, CleanBay Renewables

2022_SB903_testimony.pdf
Uploaded by: Andrew Hinz
Position: UNF

Testimony Opposing SB903
Senate Finance Committee
March 2, 2022

Position: OPPOSE

Dear Chair and Members of the Committee,

As a resident of District 40 and a lifelong Maryland ratepayer, I am writing to express my strong opposition to SB903, which would loosen the definition of "qualifying biomass" and "thermal biomass system" to include the burning of "silvicultural products" and "natural wood waste." This is a drastic move in the wrong direction for Maryland's Renewable Portfolio Standard, allowing more greenhouse-gas-emitting facilities to soak up Maryland's renewable energy money just when we need to be putting it into emissions-free technologies to face the climate crisis.

Moreover, Local communities where trees are harvested to generate electricity are devastated: "I was covered in wood pellets while being interviewed in front of the plant. I became nauseous and my eyes and nose watered just standing at the fence alongside the plant where the residents live. (Ms. M) has to use two different inhalers and take breathing treatments. She has lost her two beloved dogs."

- "The process is highly polluting, and a number of plants have been found to emit far more air pollution than their permits allow. The issue of siting polluting facilities in environmental justice communities is increasingly of concern to the Biden Administration." - https://environmentalpaper.org/2021/11/global-ngos-warn-cop26-that-burning-forest-wood-for-energy-sabotages-climate-action/
- "The wood pellet industry, including UK based biomass giant Drax, is cutting through U.S. forests almost at the speed of wildfires and committing human rights violations by deliberately siting their toxic wood pellets plants in low-income communities of color." - https://www.scoop.co.nz/stories/WO2111/S00127/global-ngos-warn-cop26-that-burning-forest-wood-for-energy-sabotages-climate-action.htm
- "the manufacturing of wood pellets pose significant dangers to human health from toxic levels of exposures to Particulate Matter (PM2.5), Volatile Organic Compounds (VOCs), Nitrogen Oxide (NOx), Carbon Monoxide (CO), Carbon Dioxide (CO2), methanol, formaldehyde, and noise pollution"- https://naacp.org/resources/resolution-wood-pellets-opposition
- "The pine pellet plant industry, and specifically Enviva, has a documented history of environmental violations and fines. they are known polluters and they are known to be environmental regulation violators. Undisputable fact." - https://www.wlox.com/app/2022/01/04/stone-county-residents-speak-out-against-proposed-enviva-plant-location/
- "Air pollution from wood pellet plants comes from various sources. There's the exhaust from a steady convoy of trucks. And, perhaps worst of all, the kiln that dries chipped trees to turn them into wood pellets, spewing loads of volatile organic compounds, or VOCs, that contribute to smog and ozone pollution; aggravate asthma and other lung conditions; cause cancer; and trigger itchy eyes and skin. In between, too, there are additional VOCs sent into the air when the hammermills shred trees and the pellets are fully processed. The wood pellet industry and regulators almost never account for that pollution in permitting." - https://www.huffpost.com/entry/biomass-energy-power-plants_n_61bcb6cae4b0a3722477d16a
- "Emissions calculations showed the Amite facility was emitting three times more pollution than allowed by its permit. A third facility in Louisiana — also in a low-income area —

was also in violation." - https://southerlymag.org/2021/02/25/mississippi-biomass-facility-fined-for-emitting-three-times-more-air-pollution-than-permitted/

- "Like (in) North Carolina, Enviva's current permit proposal with the Mississippi Department of Environmental Quality is equally devoid of substantive controls to protect public health and preserve quality of life." – Karen T. Egland, Chair, Environmental and Climate Justice Committee, NAACP National Board of Directors

Local communities where trees are burned to generate electricity are devastated:

- "The plant is a major emitter of carbon monoxide, sulfur dioxide, particulates, hazardous air pollutants, toxic air pollutants, and a range of other potentially dangerous emissions. When combined with other air sources in the area, Robeson County has some of the worst air impacts in the state. These emissions are direct causes of severe health issues."
- "Burning these fuels (wood chips, poultry litter) is actually turning out to be dirtier than coal on a per-megawatt basis for most pollutants . . . The NCRP facility was (and still is) emitting pollutants at rates that exceeded the Clean Air Act's major source threshold, but the facility never obtained the Title V major source permit necessary to protect air quality and public health . . . NCRP has Violated emission limits for fine particulate matter, sulfur dioxide, and nitrogen oxides; Routinely failed to operate required monitoring technology; Improperly removed necessary air pollution control; Failed to conduct required emissions testing in a timely manner; Committed numerous other monitoring and recordkeeping violations . . . The facility underestimates emissions of hazardous air pollutants, which are those that Congress has listed as toxic and/or carcinogenic even in very small quantities. This means, the facility is evading even more stringent pollution control technology."- Robeson County Cooperative for Sustainable Development, Lumber Riverkeeper, Waccamaw Riverkeeper, Winyah Rivers Alliance, Clean AIRE NC, Medical Advocates for Healthy Air, Dogwood Alliance, North Carolina Sierra Club, North Carolina Conservation Network, North Carolina Climate Solutions Coalition, Toxic Free North Carolina, Coastal Plain Conservation Group, Spruill Farm Conservation Project, the Rachel Carson Council, Partnership for Policy Integrity, Natural Resources Defense Council, Our Children's Earth, Friends of the Earth, Environmental Integrity Project.

Andrew Hinz
1427 Park Avenue
Baltimore, Maryland 21217

SB0903 Renewable Energy Portfolio Standard - Quali

Uploaded by: Dave Arndt

Position: UNF

Committee: Finance

Testimony on: SB0903 Renewable Energy Portfolio Standard - Qualifying Biomass and Thermal Biomass Systems

Submitted by: Dave Arndt

Position: Unfavorable

Hearing Date: March 1, 2022

I am strongly opposed to Senate Bill 903 and requests an unfavorable report from the Finance

Committee.

It had been assumed that young trees mop up more carbon than old ones because they are fast-growing, but recent studies have revealed that ancient woodland growing in temperate regions takes up more CO2 than young plantations. This is because in some cases, growth accelerates with age and CO2 absorption is approximately equivalent to biomass (Nature 507 90). Far from plateauing in terms of carbon sequestration at a relatively young age as was long believed, older forests (for example over 200 years of age without intervention) contain a variety of habitats, typically continue to sequester additional carbon for many decades or even centuries, and sequester significantly more carbon than younger and managed stands. - The journal Frontiers in Forests and Global Change (2 27).

But even if old trees are continuing to draw down CO2, what happens when a tree dies? Current carbon accounting assumes that all the carbon from dead wood is released back into the atmosphere again. Removing forest thinnings and burning them to produce energy is therefore viewed as better than leaving them on the forest floor to rot. However, we need to consider the carbon stored in the soil too. Removing and burning 'waste' wood lowers the source of carbon for forest soils. This allows soils to become net sources of carbon to the atmosphere as bacterial and fungal respiration continue to release soil carbon into the atmosphere.

New studies have revealed that even if the pellets are made from forestry residues rather than whole trees, combustion produces a net increase of CO2 emissions of 55–79% after 10 years over normal forest decomposition. (Environ. Res. Lett. 13 035001). Even after 40 years, models show that net emissions are still 25–50% greater than normal decomposition. Therefor it is concluded that biomass energy can't be considered carbon neutral in a timeframe that is meaningful for climate-change mitigation.

Also, new studies have revealed that combustion of wood product releases many pollutants into the air including fine particulates that cause asthma. Therefore, this technology is especially bad for Maryland residents and the Maryland environment.

If forest need to be thinned or there are waste wood products that need to be disposed of, there are better ways to do this in an eco-friendly way. Such as turning it into mulch, turning it into compost, or turning them into construction materials like press wood.

Finally, if companies still want to do the turn biomass into energy, that is still allowed, however we should not finance this dirty fuel as part of our RPS.

Thank you,

Dave Arndt

Testimony of Deborah Cohn opposing SB903.pdf
Uploaded by: Debbie Cohn
Position: UNF

Testimony on:	SB903: Renewable Energy Portfolio Standard – Qualifying Biomass and Thermal Biomass Systems
Committee:	Senate Finance Committee
Hearing Date:	March 2, 2022
Position:	OPPOSE

Dear Chair and Members of the Committee,

As a resident of District 16 concerned about climate change for the sake of my infant grandchild who, with his parents, also reside in District 16, and as a utility customer required to support several polluting energy sources currently considered Tier 1 renewable energy sources, I am writing to express my strong opposition to SB903. This bill would expand the definition of "qualifying biomass" and "thermal biomass system" to include the burning of "silvicultural products" and "natural wood waste," resulting in customer financial support of yet more polluting energy sources.

Maryland's Renewable Portfolio Standard (RPS), established in 2004, sets goals for Maryland's transition to renewable energy and determines which energy sources can be used to meet that target. The RPS system was created to allow users of energy to provide funds to support growth of energy sources that do not emit carbon dioxide or equivalents (CO_2-e). Many energy sources deemed "renewable" under Maryland law[1] produce substantial amounts of greenhouse gases. Thus, not all energy sources defined as "renewable" under Maryland law are emissions free, *i.e.*, "clean" renewable energy. Many renewable sources are dirty sources.

SB903 would take us in the wrong direction. It would add to Tier 1 renewable energy new forms of combustion that release greenhouse gases. Allowing silviculture products and natural wood waste to be burned directly as fuel, expanding the types of combustion-based facilities allowed in the RPS, would generate more greenhouse gasses than allowing wood waste to decompose naturally on the forest floor. Burning woody biomass creates an immediate release of carbon and eliminates a long-term carbon sink. Although new trees can be planted, their ability to sequester carbon increases only gradually over many years.[2] How can we justify subsidizing private economic activities that combust wood waste and silviculture products, and that may indirectly encourage non-sustainable harvesting practices, while with public funds we support planting of one million trees in Maryland? **SB903 represents undesirable public policy that undermines the State's decarbonization goals.**

Expanding the definition of qualifying biomass in the RPS would result in more utility customer funds supporting pollution that harms the health of Maryland residents. A recent Harvard School of Public Health Study[3] found that biomass and wood represent the fastest-growing share of early deaths in the major energy-consuming sectors. Burning wood for electricity produces as much or more pollution than fossil fuels, including coal.[4] Biomass facilities emit high levels of

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[1] MD Code, Public Utilities, §7-701(s).

[2] According to an article in *Mongabay*, https://news.mongabay.com/2019/05/tall-and-old-or-dense-and-young-which-kind-of-forest-is-better-for-the-climate an international team of researchers found in 2014 that a typical tree's growth continues to accelerate throughout its lifetime. The team recorded growth measurements from multiple trees representing over 400 tree species from tropical, subtropical and temperate regions across six continents. They found that the growth rate for most species "increased continuously" as they aged. https://www.nature.com/articles/nature12914

[3] https://www.hsph.harvard.edu/c-change/news/gas-biomass/

[4] Report issued by The Public Employees for Environmental Responsibility (PEER Report). https://www.marylandmatters.org/wp-content/uploads/2022/02/PEER-Report-Maryland-RPS-2.4.22-Final-w-links1.pdf at 6.

particulate matter (PM), nitrogen oxides (NOx), carbon monoxide (CO), sulfur dioxide (SO2), lead, mercury, and other hazardous air pollutants that cause asthma, heart disease, lung disease and cancer.[5]

Given the urgency of the climate crisis and the knowledge that people's health will be harmed by biomass facilities, we must not expand the definition of qualifying biomass in the RPS. Given that the Greenhouse Gas Mitigation Working Group of the Maryland Commission on Climate Change is currently conducting a study on woody biomass energy sources' true greenhouse gas impacts, passing this legislation now before that process is completed would be untimely and ill-advised.

Please oppose SB903. Please do not exacerbate the problem of pollution in our Renewable Portfolio Standard.

Thank you.

Deborah Cohn
6212 Goodview Street
Bethesda, MD 20817

[5] PEER Report at 6.

Testimony opposing SB903 .pdf
Uploaded by: Debbie Cohn
Position: UNF

Testimony on:	SB903: Renewable Energy Portfolio Standard – Qualifying Biomass and Thermal Biomass Systems
Committee:	Senate Finance Committee
Hearing Date:	March 2, 2022
Position:	OPPOSE

Dear Chair and Members of the Committee,

As a resident of District 16 concerned about climate change for the sake of my infant grandchild who, with his parents, also reside in District 16, and as a utility customer required to support several polluting energy sources currently considered Tier 1 renewable energy sources, I am writing to express my strong opposition to SB903. This bill would expand the definition of "qualifying biomass" and "thermal biomass system" to include the burning of "silvicultural products" and "natural wood waste," resulting in customer financial support of yet more polluting energy sources.

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Given the urgency of the climate crisis and the knowledge that people's health will be harmed by biomass facilities, we must not expand the definition of qualifying biomass in the RPS. Given that the Greenhouse Gas Mitigation Working Group of the Maryland Commission on Climate Change is currently conducting a study on woody biomass energy sources' true greenhouse gas impacts, passing this legislation now before that process is completed would be untimely and ill-advised.

Please oppose SB903. Please do not exacerbate the problem of pollution in our Renewable Portfolio Standard.

Thank you.

Deborah Cohn
6212 Goodview Street
Bethesda, MD 20817

[5] PEER Report at 6.

SB0903-RPS-Qualifying Biomass-CJW-Finance-OPP.pdf
Uploaded by: Diana Younts
Position: UNF

Committee: **Finance**
Testimony on: **SB903 - RPS-Qualifying Biomass & Thermal Biomass**
Organization: **MLC Climate Justice Wing**
Submitting: **Diana Younts, Co-chair**
Position: **Oppose**
Hearing Date: **March 1, 2022**

Dear M. Chair and Committee Members,

Thank you for allowing our testimony in strongly opposing SB903 and we request an unfavorable report.. The MLC Climate Justice Wing is a statewide coalition of over 50 grassroots and grasstops groups advocating for climate and climate justice legislation.

As Maryland attempts to remove dirty fuels from its renewable portfolio standards (this committee took the lead in removing black liquor from the RPS), this bill takes us in the opposite direction and would increase the amount of dirty, greenhouse gas producing fuels in Maryland's "clean" renewable portfolio standards.

SB903 modifies the provisions of Maryland's Renewable Portfolio Standard to provide Tier 1 status to qualifying biomass burned as a sole feedstock to produce thermal energy. Currently, the RPS law only provides Tier 1 status to thermal energy generators that primarily combust animal manure. Qualifying biomass may be combusted only as a secondary component of the feedstock.

This bill was introduced last year as SB549. The House committee referred the bill for study rather than take immediate action. The Maryland Commission on Climate Change (MCCC) established a Mitigation Working Group to study the issue and to make recommendations. That report is expected to be completed in Fall, 2023. The General Assembly should respect this mandate to the MCCC and this committee at a minimum take no action until the report has been published and fully digested.

Moreover, last year's bill had been referred for study in part because its definitional terms were vague and it was unclear the scope of the impact of that bill. In SB903, instead of seeking to limit the scope of qualifying biomass, it makes clear that qualifying biomass would include "all raw products" produced from a forest – including whole trees – and could vastly accelerate the deforestation of Maryland through opening the door to abusive forestry practices..

Further, this bill circumvents Maryland's progress towards alternative uses of animal manure and food waste. Incineration of biomass for heat production also produces greenhouse gases into the air and to the deposition of nitrogen oxide into the Bay when it rains. The diversion of animal litter and food waste to a cheaper, more polluting process would *increase* our greenhouse gas emissions and would undermine truly renewable sources like wind, solar and geothermal in the renewable energy portfolio.

The RPS is among our state's most important programs for substantially reducing our greenhouse gas emissions. The RPS' increased importance under the 2019 Clean Energy Jobs Act means it should be focused on incentivizing new, renewable energy facilities which will support Maryland's efforts to mitigate

climate change. Expanding the RPS to incentive burning trees, as this bill would do, is wrong. It would lead to the release of a significant amount of CO2 and other pollutants.

For these reasons, we urge you to vote UNFAVORABLE for SB903.

MLC Climate Justice Wing:

Assateague Coastal Trust
Maryland Legislative Coalition
MD Campaign for Environmental Human Rights
Chesapeake Climate Action Network
WISE
Frack Free Frostburg
Mountain Maryland Movement

Howard County Indivisible
Howard County Sierra Club
Columbia Association Climate change and sustainability advisory committee
HoCo Climate Action
CHEER
Climate XChange - Maryland
Mid-Atlantic Field Representative/
National Parks Conservation Association
350 Montgomery County
Glen Echo Heights Mobilization
The Climate Mobilization Montgomery County
Montgomery County Faith Alliance for Climate Solutions
Montgomery Countryside Alliance
Takoma Park Mobilization Environment Committee
Audubon Naturalist Society
Cedar Lane Unitarian Universalist Church Environmental Justice Ministry
Coalition For Smarter Growth
DoTheMostGood Montgomery County
MCPS Clean Energy Campaign
MoCo DCC
Potomac Conservancy

Casa de Maryland
Nuclear Information & Resource Service
Clean Air Prince Georges
Laurel Resist
Greenbelt Climate Action Network
Maryland League of Conservation Voters
Unitarian Universalist Legislative Ministry of Maryland
Concerned Citizens Against Industrial Cafos
Wicomico NAACP
Chesapeake Physicians for Social Responsibility
Chispa MD
Climate Law & Policy Project
Maryland Poor Peoples Campaign
Labor for Sustainability
The Nature Conservancy
Clean Air Prince Georges
350 Baltimore
Maryland Environmental Health Network
Climate Stewards of Greater Annapolis
Talbot Rising
Adat Shalom Climate Action
Chesapeake Earth Holders
Climate Parents of Prince Georges
Echotopia
Maryland NAACP State Conference, Environmental Justice Committee

SB 903_Partners OPPOSE.pdf
Uploaded by: Doug Myers
Position: UNF

Senate Bill 903

Renewable Energy Portfolio Standard – Qualifying Biomass and Thermal Biomass Systems

Date: March 1, 2022
From: Chesapeake Bay Foundation
Chesapeake Climate Action Network Action Fund
Sierra Club Maryland Chapter
Chesapeake Physicians for Social Responsibility
Indivisible Howard County
Elders Climate Action Maryland

Position: **Oppose**
To: Senate Finance Committee

The above-listed organizations **OPPOSE** SB 903 which broadens the definition of qualifying biomass as a Tier 1 Renewable Energy Source and allows those sources to be burned directly as fuel.

Our organizations have supported the conversion of biomass from a waste product to a fuel source so long as doing so results in a net environmental improvement. For example, animal manure which has been produced in excess resulting in phosphorus-saturated soils and phosphorus runoff to waters of the state and Chesapeake Bay can be digested anaerobically to produce clean burning fuel for heat and electricity production at or near the source of that energy use. Doing so reduces the total weight of any waste product (digestate) which may need to be transported, assists the state in implementing the Phosphorus Management Tool to address excess manure application to farm fields and reduces reliance on fossil fuels for those same energy needs.

The allowance of "silvicultural products and natural wood waste" to be burned directly as fuel has the potential to increase deforestation across the state, generate more greenhouse gases than the natural decomposition of those components of forestry and emit soot particles known to cause respiratory issues. We see these as compounding environmental negatives as compared to the status quo. Inclusion of these sources into the Renewable Energy Portfolio Standard must come with a rigorous life-cycle analysis that demonstrates a reduction in water and air pollution, including greenhouse gases.

Current analysis by the Mitigation Working Group of the Maryland Commission on Climate Change is underway that focuses on the impacts to other Tier 1 resources. Without a deeper understanding of the impacts to energy sources like solar and wind – that have zero carbon emissions – it's premature to include biomass as a Tier 1 resource. The recommendations for how or if to include biomass as a Tier 1 is due later this year and we should give that body the opportunity to complete the analysis.

We urge the Committee's UNFAVORABLE report on SB 903.

ACT Oppose SB903 woody biomas rps.pdf
Uploaded by: Gabrielle Ross
Position: UNF

Assateague Coastal Trust – PO Box 731, Berlin, MD 21811 – 410-629-1538

Testimony Opposing SB903
Senate Finance Committee
March 2, 2022

Position: OPPOSE

Dear Honorable Chair and Members of the Committee,

As a resident of 38C and a representative for the citizens of Worcester, Wicomico and Somerset counties, I am writing to express my strong opposition to SB903, which would loosen the definition of "qualifying biomass" and "thermal biomass system" to include the burning of "silvicultural products" and "natural wood waste." This is a drastic move in the wrong direction for Maryland's Renewable Portfolio Standard, allowing more greenhouse-gas-emitting facilities to soak up Maryland's renewable energy money just when we need to be putting it into emissions-free technologies to face the climate crisis.

Allowing these products to be burned directly as fuel, expanding the types of combustion-based facilities allowed in the RPS, would generate more greenhouse gasses than allowing wood waste to decompose naturally on the forest floor. Although trees can ultimately regenerate and replace themselves in the long term, that does not mean burning them helps with greenhouse gas emissions in the short term - quite the opposite. Newly planted trees have far less benefit to the climate and local air quality than a mature tree or a fully-functioning forest ecosystem. Burning trees releases CO2 into the air immediately, and the carbon isn't recaptured unless and until newly planted replacement trees grow to maturity over many decades. Just this week, the IPCC released a new report declaring that many human and natural systems are already buckling under global warming's impact, and some are already approaching the limits of their ability to adapt. We need to invest in energy infrastructure that is truly emissions-free, today.

Expanding the definition of qualifying biomass in the RPS would also put Maryland dollars behind pollution that harms local communities. A recent Harvard School of Public Health Study found that biomass and wood have the fastest-growing share of early deaths in the major energy-consuming sectors; burning wood for electricity produces as much or more pollution than fossil fuels, including coal. Biomass facilities emit high levels of particulate matter (PM), nitrogen oxides (NOx), carbon monoxide (CO), sulfur dioxide (SO2), lead, mercury, and other hazardous air pollutants than coal. We would never include burning coal in the Renewable Portfolio Standard, so we should not include burning silvicultural products and wood waste, either.

With the urgency of the climate crisis and the knowledge that people's health will be harmed by biomass facilities, we must not expand the definition of qualifying biomass in the RPS - quite the opposite. When the Greenhouse Gas Mitigation Working Group of the Maryland Commission on Climate Change is currently conducting a study on woody biomass energy sources' true greenhouse gas impacts, passing this legislation now before that process is completed would be especially ill advised. **Please oppose SB903 and do not make the problem of pollution in our Renewable Portfolio Standard even worse.**

Sincerely,

Gabrielle Ross, Assateague Coastkeeper
Assateague Coastal Trust

Studies:

https://www.hsph.harvard.edu/c-change/news/gas-biomass/

Testimony Opposing SB903.pdf
Uploaded by: Gwen DuBois
Position: UNF

CHESAPEAKE PSR PHYSICIANS FOR SOCIAL RESPONSIBILITY

1985 NOBEL PEACE PRIZE

Testimony Opposing SB903
Senate Finance Committee
March 2, 2022

Position: OPPOSE

Dear Chair and Members of the Committee,

Chesapeake Physicians for Social Responsibility opposes SB903, which would change the definition of "qualifying biomass" and "thermal biomass system" to include the burning of "silvicultural products" and "natural wood waste." We oppose this bill because it will subsidize the burning of biofuels and wood that are major sources of air pollution from deadly fine particulate matter of 2.5 microns or less (PM2.5).

Chesapeake Physicians for Social Responsibility (CPSR) is statewide evidenced-based, organization of over 900 physicians. other health professionals and supporters, that addresses the existential public health threats: nuclear weapons, the climate crisis and the issues of pollution and toxics' effect on health as seen through the intersectional lens of environmental, social and racial justice. As an organization founded by physicians, we understand that prevention is far superior to treatment in reducing costs; death, illness, injury, and suffering

A recent study from Harvard School of Public Health that looked at PM2.5 emissions from stationary sources of air pollution found that there is increasing PM2.5 air pollution when wood and biomass is used as the source of fuel which has significant health impacts. In 2017, the health impacts of biomass and wood combustion from PM2.5 from stationary sources in the United States were higher than from combustion of coal and gas taken individually. Industrial boilers had the highest emissions and health impacts, followed by residential buildings, electricity, and then commercial buildings.[1]
PM2.5 exposures are associated with increased all-cause mortality and increased mortality from ischemic heart disease, stroke, COPD, lung cancer, and lower respiratory infections although other causes may also be related to increased mortality from PM2.5 [2] Worldwide air pollution was estimated to cause 4.2 million premature deaths worldwide per year in 2016 due to exposure to PM2.5, due to cardiovascular and respiratory disease, and cancers.[3] Some studies have shown a relation between long term exposure to elevated pm2.5 levels, and hospitalization for COVID-19 in patients with underlying lung disease.[4]

[1] https://iopscience.iop.org/article/10.1088/1748-9326/abe74c
[2] https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2755672
[3] https://www.who.int/news-room/fact-sheets/detail/ambient-(outdoor)-air-quality-and-health
[4] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7835077/

We must not substitute one deadly air pollutant for another when there are cleaner, safer alternatives to coal including wind, solar, geothermal and of course efficiency. We surely shouldn't be spending Marylanders' money to subsidize an energy source that could harm our health and waste rate payers money when it is burned in the State and just wastes Marylander rate payers' money and harms other peoples' health when it is burned elsewhere. What it doesn't do is increase use of those sources of clean energy that reduce greenhouse gases **and** reduce air pollution at the same time. That is what a cleaned up RPS should do.

Chesapeake Physicians for Social Responsibility opposes SB903 because it would increase air pollution from PM2.5 which would have significant health impacts.

Gwen L. DuBois MD, MPH
President Chesapeake Physicians for Social Responsibility
gdubois@jhsph.edu

SB903 - Clean Water Action - Unfavorable.pdf
Uploaded by: Jennifer Kunze
Position: UNF

Testimony Opposing SB903
Senate Finance Committee
March 2, 2022

Position: OPPOSE

Dear Chair and Members of the Committee,

Clean Water Action and the Reclaim Renewable Energy Coalition strongly oppose SB903, which would loosen the definition of "qualifying biomass" and "thermal biomass system" to include the burning of "silvicultural products" and "natural wood waste." This is a drastic move in the wrong direction for Maryland's Renewable Portfolio Standard, allowing more greenhouse-gas-emitting facilities to soak up Maryland's renewable energy money just when we need to be putting it into emissions-free technologies to face the climate crisis.

Allowing these products to be burned directly as fuel, expanding the types of combustion-based facilities allowed in the RPS, would generate more greenhouse gasses than allowing wood waste to decompose naturally on the forest floor. Although trees can ultimately regenerate and replace themselves in the long term, that does not mean burning them helps with greenhouse gas emissions in the short term - quite the opposite. Newly planted trees have far less benefit to the climate and local air quality than a mature tree or a fully-functioning forest ecosystem. Burning trees releases CO2 into the air immediately, and the carbon isn't recaptured unless and until newly planted replacement trees grow to maturity over many decades. Just this week, the IPCC released a new report declaring that many human and natural systems are already buckling under global warming's impact, and some are already approaching the limits of their ability to adapt. We need to invest in energy infrastructure that is truly emissions-free, today.

Expanding the definition of qualifying biomass in the RPS would also put Maryland dollars behind pollution that harms local communities. A recent Harvard School of Public Health Study found that biomass and wood have the fastest-growing share of early deaths in the major energy-consuming sectors; burning wood for electricity produces as much or more pollution than fossil fuels, including coal. Biomass facilities emit high levels of particulate matter (PM), nitrogen oxides (NOx), carbon monoxide (CO), sulfur dioxide (SO2), lead, mercury, and other hazardous air pollutants than coal. We would never include burning coal in the Renewable Portfolio Standard, so we should not include burning silvicultural products and wood waste, either.

With the urgency of the climate crisis and the knowledge that people's health will be harmed by biomass facilities, we must not expand the definition of qualifying biomass in the RPS - quite the opposite. When the Greenhouse Gas Mitigation Working Group of the Maryland Commission on Climate Change is currently conducting a study on woody biomass energy sources' true greenhouse gas impacts, passing this legislation now before that process is completed would be especially ill advised. Please oppose SB903 and do not make the problem of pollution in our Renewable Portfolio Standard even worse.

Sincerely,

Jennifer Kunze
Maryland Coordinator
Clean Water Action

Reclaim Renewable Energy Coalition

sb903, biomass, tier 1 2022.pdf
Uploaded by: Lee Hudson
Position: UNF

Delaware-Maryland Synod
Evangelical Lutheran Church in America
God's work. Our hands.

Testimony prepared for the
Finance Committee
on
Senate Bill 903
March 1, 2022
Position: **Unfavorable**

Madam Chair and members of the Committee, thank you for this opportunity to speak about wise stewardship of creation. I am Lee Hudson, assistant to the bishop for public policy in the Delaware-Maryland Synod, Evangelical Lutheran Church in America. We are a faith community in three ELCA synods in every part of our State.

The ELCA identified greenhouse gases as environmental pollutants because of deleterious effects on climate in 1993. ("Caring for Creation," ELCA 1993 assembly)

While biomasses are regular byproducts of several agricultural and natural resource industries, and thus "renewable" in some manner, they still generate greenhouse gases. Burning them, in particular, meets no definition of "clean" and will frustrate the effort at GGRs.

We oppose **Senate Bill 903** and urge an unfavorable report.

Lee Hudson

5699 Meridale Rd. Baltimore, MD 21228 410-230-2860 800-869-5492 fax 410-230-2871

SB903_Food & Water Action_OPP_LHawkins.pdf
Uploaded by: Lily Hawkins
Position: UNF

Lily Hawkins
Food & Water Action
Committee: Senate Finance
Testimony On: SB903 Renewable Energy Portfolio Standard - Qualifying Biomass and Thermal Biomass Systems
Position: OPPOSE
Hearing Date March 1, 2022

Dear Chair and Members of the Committee,

Food & Water Watch, on behalf of its 40,000 members in Maryland, writes to express our strong opposition to SB903, which would loosen the definition of "qualifying biomass" and "thermal biomass system" to include the burning of "silvicultural products" and "natural wood waste" in the Renewable Portfolio Standard.

This is a big step in the wrong direction for Maryland's renewable energy program, allowing more greenhouse-gas-emitting facilities to soak up Maryland ratepayer dollars that are intended to help move us to clean energy.

Allowing these products to be burned directly as fuel would generate more greenhouse gasses than allowing wood waste to decompose naturally on the forest floor. Although trees can ultimately regenerate and replace themselves in the long term, that does not mean burning them helps with greenhouse gas emissions in the short term - quite the opposite. Newly planted trees have far less benefit to the climate and local air quality than a mature tree or a fully-functioning forest ecosystem. Burning trees releases CO2 into the air immediately, and the carbon isn't recaptured unless and until newly planted replacement trees grow to maturity over many decades. Just this week, the IPCC released a new report declaring that many human and natural systems are already buckling under global warming's impact, and some are already approaching the limits of their ability to adapt. We need to invest in energy infrastructure that is truly emissions-free, today.

Expanding the definition of qualifying biomass in the RPS would also put Maryland dollars behind pollution that harms local communities. A recent Harvard School of Public Health Study found that biomass and wood have the fastest-growing share of early deaths in the major energy-consuming sectors; burning wood for electricity produces as much or more pollution than fossil fuels, including coal. Biomass facilities emit high levels of particulate matter (PM), nitrogen oxides (NOx), carbon monoxide (CO), sulfur dioxide (SO2), lead, mercury, and other hazardous air pollutants than coal. We would never include burning coal in the Renewable Portfolio Standard, so we should not include burning silvicultural products and wood waste, either.

With the urgency of the climate crisis and the knowledge that people's health will be harmed by biomass facilities, we must not expand the definition of qualifying biomass in the RPS . Please

oppose SB903 and do not make the problem of pollution from inaccurately classified "renewable" options in our Renewable Portfolio Standard even worse.

Sincerely,
Lily Hawkins
Maryland Organizer
Food & Water Action
lhawkins@fwwatch.org

SB0903_FIN_UNFAV_HoCoClimateAction.org.pdf
Uploaded by: Liz Feighner
Position: UNF

HoCoClimateAction.org
Howard County, Maryland

Testimony on SB0903
SB903 - RPS-Qualifying Biomass & Thermal Biomass

Hearing Date: March 1, 2022
Bill Sponsor: Senators Hershey and Edwards
Committee: Finance
Submitting: Liz Feighner for Howard County Climate Action
Position: Unfavorable

HoCo Climate Action – is a 350.org local chapter and a grassroots organization representing more than 1,450 subscribers, and a member of the Climate Justice Wing of the Maryland Legislative Coalition. HoCoClimateAction **opposes** SB903 - RPS-Qualifying Biomass & Thermal Biomass

The IPCC challenges the world to reduce greenhouse emissions rapidly to avoid even more catastrophic effects of the climate crisis. An IPCC report released on Tuesday, Feb 28 confirms how little time we have to act. New York Times reports: Current efforts are too often "incremental." Instead we will need **" 'transformational' changes that involve rethinking how people** build homes, grow food, **produce energy** and protect nature.**"**

This bill would drastically move Maryland's Renewable Portfolio Standard in the wrong direction, allowing more greenhouse-gas-emitting facilities to soak up Maryland's renewable energy money just when we need to be adding emissions-free technologies to face the climate crisis. SB903 seeks to expand the scope of qualifying biomass to include "all raw products" produced from a forest – including whole trees – and could vastly accelerate the deforestation of Maryland.

The Greenhouse Gas Mitigation Working Group of the Maryland Commission on Climate Change is forming a sub-group to conduct a study on woody biomass energy sources' true greenhouse gas impacts. Passing this legislation now before that process is completed would be especially ill advised.

For all the reasons stated above, Howard County Climate Action urges an **unfavorable** vote from the committee.

HoCo Climate Action

Submitted by Liz Feighner & Ruth White, Howard County, MD
Steering and Advocacy Committee
www.HoCoClimateAction.org
HoCoClimateAction@gmail.com

SB0903-UNFAV-DTMG-3-1-22.pdf
Uploaded by: Olivia Bartlett
Position: UNF

Olivia Bartlett, DoTheMostGood Maryland Team

Committee: Finance

Testimony on: SB0903 – Renewable Energy Portfolio Standard - Qualifying Biomass and Thermal Biomass Systems

Position: Favorable

Hearing Date: March 1, 2022

Bill Contact: Senators Stephen Hershey, Jr., and George Edwards

DoTheMostGood (DTMG) is a progressive grass-roots organization with more than 3000 members in all districts in Montgomery County as well as several nearby jurisdictions. DTMG supports legislation and activities that keep residents healthy and safe in a clean environment, uplift all residents, and promote equity across all our diverse communities. DTMG strongly opposes SB0903 because it will increase the amount of dirty, greenhouse gas-producing fuels in Maryland's "clean" renewable portfolio standards which will hurt our environment.

The latest reports from world-wide climate scientists make it very clear that we must rapidly reduce greenhouse gas emissions in order to avoid the worst effects of climate change due to global warming. The best way to do that is to move away from burning things to make energy. .

Maryland's renewable portfolio standards (RPS) are among our state's most important programs for substantially reducing our greenhouse gas emissions. The RPS' increased importance under the 2019 Clean Energy Jobs Act means it should be focused on incentivizing new, clean renewable energy facilities which will support Maryland's efforts to mitigate climate change. Currently, the RPS provides Tier 1 status only to thermal energy generators that primarily combust animal manure. Qualifying biomass may be combusted only as a secondary component of the feedstock.

The Maryland Legislature has focused on removing dirty fuels, such as black liquor, from the RPS. However, SB0903 will take us in the opposite direction and add dirty fuels. SB0903 proposes to modify the provisions of Maryland's RPS to provide Tier 1 status to qualifying biomass burned as a sole feedstock to produce thermal energy. Incineration of biomass for heat production increases pollution in Maryland. It releases greenhouse gases into the air and also leads to deposition of nitrogen oxide in the Bay when it rains.

SB0903 also circumvents Maryland's progress towards alternative uses of animal manure and food waste. The diversion of animal litter and food waste to a cheaper, more polluting process will increase our greenhouse gas emissions and will undermine truly renewable sources, such as wind, solar, and geothermal, in the renewable energy portfolio.

Furthermore, SB0903 is a modification of SB0549 that was introduced in the 2021 General Assembly Session. The House committee referred the 2021 bill for study rather than take immediate action. The Maryland Commission on Climate Change (MCCC) established a Mitigation Working Group to study the issue and to make recommendations. That report is expected to be completed in Fall, 2023. The General Assembly should respect the mandate to the MCCC and, at a minimum, take no action until the report has been published and fully digested.

Moreover, last year's bill was referred for study in part because its definitional terms were vague and the scope of the impact of that bill was unclear. However, instead of seeking to limit the scope of qualifying biomass, SB0903 would include "all raw products" produced from a forest – including whole trees – in qualifying biomass and could vastly accelerate the deforestation of Maryland through opening the door to abusive forestry practices. SB0903 will incentivize burning trees. This is just wrong.

In summary, SB0903 is just bad for the environment and will lead to increased release of CO2 and other pollutants. DTMG therefore strongly opposes SB0903 and urges a **UNFAVORABLE** report on this bill.

Respectfully submitted,

Olivia Bartlett
Co-lead, DoTheMostGood Maryland Team
oliviabartlett@verizon.net
240-751-5599

SB903_IndivisibleHoCoMD_OPP_FINAL_PeterAlexander (

Uploaded by: Peter Alexander

Position: UNF

SB-903 – Renewable Energy Portfolio Standard – Qualifying Biomass and Thermal 3 Biomass Systems

Testimony before Finance Committee

March 01, 2022

Position: Opposed

Madame. Chair, Mr. Vice Chair, and members of the committee, my name is Peter Alexander and I represent the 750+ members of Indivisible Howard County. IndivisibleHoCo is an active member of the Maryland Legislative Coalition (with 30,000+ members). We are providing written testimony today to ***oppose SB903.***

I am writing to express my strong opposition to SB903, which relaxes the definition of "qualifying biomass" and "thermal biomass system". This is a drastic move in the wrong direction for Maryland's Renewable Portfolio Standard, allowing more greenhouse-gas-emitting facilities to soak up Maryland's renewable energy money just when we need to be putting it into emissions-free technologies to face the climate crisis.

We need to invest in energy infrastructure that is truly emissions-free NOW.

Burning trees generates more greenhouse gas emissions than allowing them to decompose naturally on the forest floor. Although trees can ultimately replace themselves does not mean burning them helps with greenhouse gas emissions in the short term. Newly planted trees have far less benefit to the climate and local air quality than a mature tree or a fully-functioning forest ecosystem. Burning trees releases CO2 into the air immediately, and the carbon isn't recaptured unless and until newly planted replacement trees grow to maturity over many decades.

Expanding the definition of qualifying biomass in the RPS puts Maryland dollars behind pollution that harms local communities. A recent Harvard School of Public Health Study found that biomass and wood have the fastest-growing share of early deaths in the major energy-consuming sectors; burning wood for electricity produces as much or more pollution than fossil fuels, including coal. When compared to coal-fired plants, biomass facilities emit higher levels of toxins including particulate matter (PM), nitrogen oxides (NOx), carbon monoxide (CO), sulfur dioxide (SO2), lead, mercury, and other hazardous air pollutants are released in greater amounts in Biomass facilities. We would never include burning coal in the Renewable Portfolio Standard, so we should not include burning silvicultural products and wood waste, either.

The Greenhouse Gas Mitigation Working Group of the Maryland Commission on Climate Change is currently conducting a study on woody biomass energy sources' true greenhouse gas impacts. It is completed especially ill advised to pass this legislation before that study report is complete and has had a thorough review.

We respectfully urge an unfavorable report on SB903.

Peter Alexander

Woodbine, MD

Testimony(SB903)) MD thermal Biomass 3-1-22 unfavo

Uploaded by: Rhonda Kranz

Position: UNF

Committee: Finance
Testimony on: SB903 - RPS-Qualifying Biomass & Thermal Biomass
Submitting: Rhonda Kranz (5 Montgomery Ave, Takoma Park, MD)
Position: Oppose
Hearing Date: March 1, 2022

Dear M. Chair and Committee Members:

Thank you for allowing my testimony in strong opposition of SB903 - RPS-Qualifying Biomass & Thermal Biomass. As a biologist and environmental professional, I am very concerned about how this bill would move us backward in our efforts to mitigate climate change and decrease pollution of our air and water.

Maryland's Renewable Portfolio is among our state's most important programs for substantially reducing our greenhouse gas emissions. The RPS' increased importance under the 2019 Clean Energy Jobs Act means it should be focused on incentivizing new, renewable energy facilities which will support Maryland's efforts to mitigate climate change. This bill will, instead, expand the RPS to incentive burning trees and lead to the release of a significant amount of CO2 and other pollutants.

As Maryland attempts to remove dirty fuels from its renewable portfolio standards (this committee took the lead in removing black liquor from the RPS), this bill takes us in the opposite direction and would increase the amount of dirty, greenhouse gas producing fuels in Maryland's "clean" renewable portfolio standards.

SB903 modifies the provisions of Maryland's Renewable Portfolio Standard to provide Tier 1 status to qualifying biomass burned as a sole feedstock to produce thermal energy. Currently, the RPS law only provides Tier 1 status to thermal energy generators that primarily combust animal manure. Qualifying biomass may be combusted only as a secondary component of the feedstock.

The bill circumvents Maryland's progress towards alternative uses of animal manure and food waste. Incineration of biomass for heat production also produces greenhouse gases into the air and to the deposition of nitrogen oxide into the Bay when it rains. The diversion of animal litter and food waste to a cheaper, more polluting process would *increase* our greenhouse gas emissions and would undermine truly renewable sources like wind, solar and geothermal in the renewable energy portfolio.

Last year the House committee referred SB549 for study rather than take immediate action. A report from is expected to be completed in Fall, 2023. The committee should respect their mandate.

For these reasons, I urge you to vote UNFAVORABLE for SB903.

MCEC T.2022 SB903.pdf
Uploaded by: Katherine Magruder
Position: INFO

I. Katherine Magruder
Executive Director
ikm@mdcleanenergy.org
301-314-6061

Maryland Clean Energy Center (MCEC) was created as an instrumentality of state in 2008, through an act of the Maryland General Assembly.

MCEC focuses on an economic development mission to advance the adoption of clean energy and energy efficiency products, services and technologies along with the associated jobs and wages for Maryland. MCEC leverages private capital and private sector capabilities; facilitates the commercialization of innovative advanced energy technologies; strives to reduce energy costs for consumers, and drive reductions in greenhouse gas emissions associated with the use of fossil fuels.

SB 903 – Renewable Energy Portfolio Standard - Qualifying Biomass and Thermal Biomass Systems

First Reading: February 7th, 2022
Hearing Date: March 1st, 2022, at 1pm **Senate Finance Committee**

INFORMATIONAL TESTIMONY

In considering the appropriate action of the committee on this pending legislation, the Maryland Clean Energy Center (MCEC) offers the following for consideration by its members:

Currently, Maryland sources 75% of its energy consumption needs from fossil fuel resources[1], but has committed itself to The Greenhouse Gas Emissions Reduction Act[2] which has goals of sourcing 50% of all energy needs from renewable sources by 2030 and 100% by year 2040.

The Maryland Renewable Portfolio Standard (RPS) acts as a signal to the marketplace to incentivize the investment in certain forms of renewable energy generation capacity. The RPS allows for fiscal benefit to project developers who wish to own, build and operate various forms of energy technology to serve the Maryland consumer audience, but the incentive is also a tool for the state to achieve certain desirable environmental outcomes including but possibly not limited to the reduction of greenhouse gas emissions.

This bill proposes to include qualifying biomass as a Tier 1 Thermal Renewable Energy Credit (TREC). In addition to wind and solar energy generation, deployment of other energy technologies may allow the State to achieve other desirable outcomes related to sustainability; and as such should be considered in relation to accessing the RPS incentive benefits. Biomass energy can be a valuable part of reducing and eliminating dependence on fossil fuels, generating energy on demand without expensive battery storage, and mitigating issues with intermittency and land use that can occur with solar and wind generation. If this bill passes, it will likely be an economic incentive for small to medium scale facilities within the state that currently heat using fossil fuels to switch to biomass boilers or combined heat and power (CHP) systems.

Developing markets for waste wood residues for biomass energy systems can benefit the environment and the economy. Biomass energy creates a market for small-diameter, "low-value" wood

[1] *Maryland Energy Consumption Estimates.* (2019.) U.S. Energy Information Administration. https://www.eia.gov/state/?sid=MD#tabs-1
[2] Maryland Department of the Environment. (Feb 2021). The Greenhouse Gas Emissions Reduction Act; 2030 GGRA Plan.

generated by active forest management upkeep. Having a market for landowners to sell the waste generated from regular management creates an incentive for landowners to resist high-grading forests and/or land use change that would result in deforestation.

Incentivizing biomass energy through TRECs is linked to maintaining healthy forests in Maryland. In 2013, Maryland adopted a "No Net Loss of Forests" policy to ensure that 40% of the state will remain covered by tree canopy. Currently, Maryland forests are growing 2.6 times faster than they are being removed with natural mortality rates increasing and removal rates decreasing since 1999[3]. Active forest management practices such as thinning can help decrease natural mortality by preventing overcrowding of forests, an important mechanism for adapting forest to changing climate conditions.

Modern biomass energy technologies are designed to meet or exceed Maryland Air Quality Standards. Maryland has strict regulations that limit emissions and require the most efficient technology that help filter emissions and reuse waste heat to achieve higher efficiencies. Facilities with biomass boilers must comply by law with proper notification, reporting, and record-keeping requirements Maryland has already established for environmental protection. The Maryland Greenhouse Gas Reduction (GHG) Act[4] requires a reduction of 40% of baseline levels (2009 emissions) by 2030. Studies have found that the lifecycle for bioenergy can achieve emission reductions of GHGs by over 80% compared to fossil fuels[5]. Wood energy releases less sulfur oxides (SO_x) and nitrogen oxides (NO_x) than traditional fossil fuels[6].

Biomass reduces fossil fuel imports and helps stimulate the local economy. For biomass to make economic and environmental sense, it is typically sourced within 50 miles of the facility where it will be used. Since the supply chain is Maryland-based, the money spent on biomass residues will remain in the community's radius. Unlike imported fossil fuels, which only produces $0.34 of economic activity per dollar invested, biomass has a pay back of $1.50 per $1 spent within the community[7]. Additionally, it is estimated that producing 100,000 tons of pellets annually can create up to 342 direct jobs[8].

The Maryland Climate Change Commission (MCCC) 2021 Annual Report lists biomass energy as a sustainable energy solution that will help the state achieve a net-zero economy by 2045[9]. Additionally, creating thermal renewable energy credits for qualifying biomass energy would achieve immediate legislative actions recommended by the 2021 Maryland Forestry Economic Adjustment Strategy and the 2022 Task Force on the Economic Future of Western Maryland.

Due to its efficiency and ability to be used on-demand without energy storage, thermally led biomass energy is complementary to other renewable energy sources. Developing a resilient grid requires identifying the strengths of each system. Biomass energy is efficient – ranging from 70-90% in thermally led systems[10]. In 2019, the Environmental Protection Agency recognized woody biomass as a carbon-neutral, renewable energy source due to the increased carbon sequestration rate of actively managed

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forests. The IPCC's 2018 Special Report *Global Warming of 1.5º* states that biomass plays a key role in a "rapid and profound near-term de-carbonization of energy supply.[11]"

Including qualifying biomass as a Tier 1 Thermal Renewable Energy Credit is beneficial to Maryland's environment, energy gird, and local economy.

[11] IPCC. (2018). *Global Warming of 1.5º: Chapter 2: Mitigation Pathways Compatible with 1.5-Degree Celsius in the Context of Sustainable Development.* Retrieved from: https://www.ipcc.ch/site/assets/uploads/sites/2/2019/05/SR15_Chapter2_Low_Res.pdf

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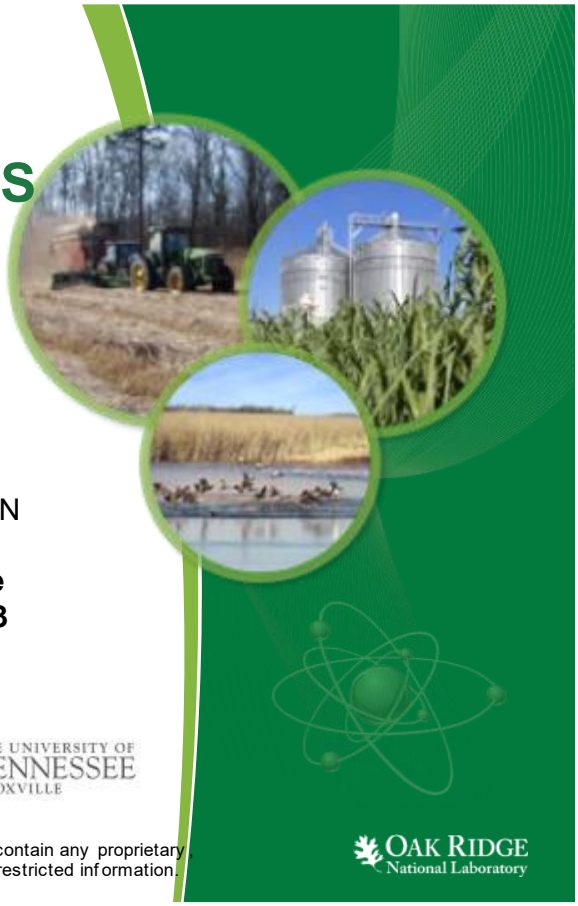
Uploaded by: Virginia Dale
Position: INFO

Testimony for SB0903 from Virginia Dale 3-1-22

Environmental effects of wood pellet production in the SE US for bioenergy



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Keith Kline and Esther Parish
Environmental Sciences Division
Oak Ridge National Laboratory, Oak Ridge, TN

Testimony submitted to Maryland Senate Finance Committee regarding Bill SB903

March 1, 2022

THE UNIVERSITY OF TENNESSEE KNOXVILLE

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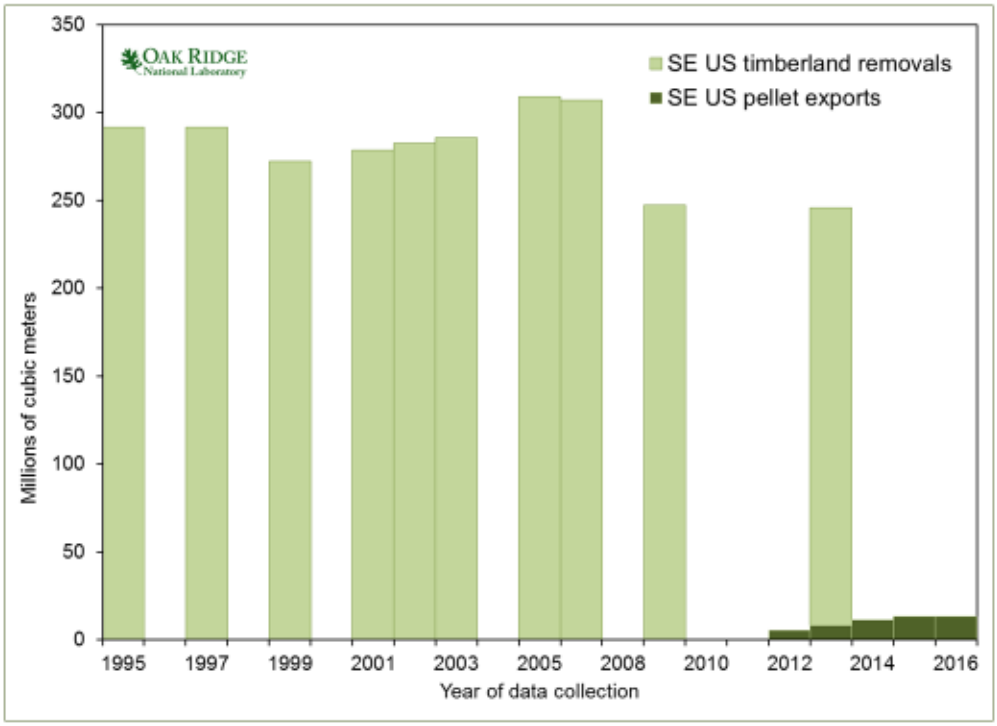
US industrial wood pellet trade has been growing

Source: Parish, Herzberger, Phifer, and Dale (2018) *Ecology & Society*

Only a small portion of SE US timberland removals are used for pellets



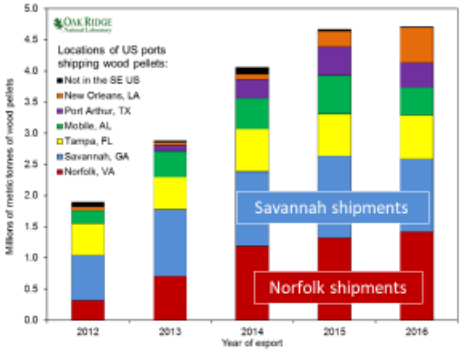
From E. Parish, V. Dale, K. Kline (2017) *World Biomass*

Issues pertaining to Sustainability

- **How does SE US pellet production for export to Europe differ from the business-as-usual case of no pellet production?**
  - Under what conditions does the pellet industry complement or compete with pulpwood use?
  - Will pellet industry alter amount of land staying in the forest?
- **Are there significant changes to key indicators?**
  - Biodiversity
  - GHG emissions
  - Soil quality
  - Jobs
  - Water & air quality
  - Preserving land as forest
- **How can forest conditions be monitored & good practices implemented?**
  - Analysis of Forest Inventory & Analysis (FIA) data
  - Best Management Practices (BMPs)
  - Sustainable Forestry Initiative's certified Fiber Sourcing Standard

Participants of ORNL's April 2016 Bioenergy Study Tour helped address these questions. See Dale et al. (2017) *GCB Bioenergy*

Over half of US wood pellets ship to Europe from Norfolk & Savannah



- We examined timberland changes in the two fuelsheds supplying these ports before and after export pellet production began in 2009.
- Our hypothesis was no change.

Source: E. Parish, V. Dale, K. Kline (2017) *World Biomass*

We used annual Forest Inventory and Analysis (FIA) data collected by the US Forest Service

FIA plot demonstration at UT Arboretum

Parish, Dale, Kline (2017) *World Biomass*

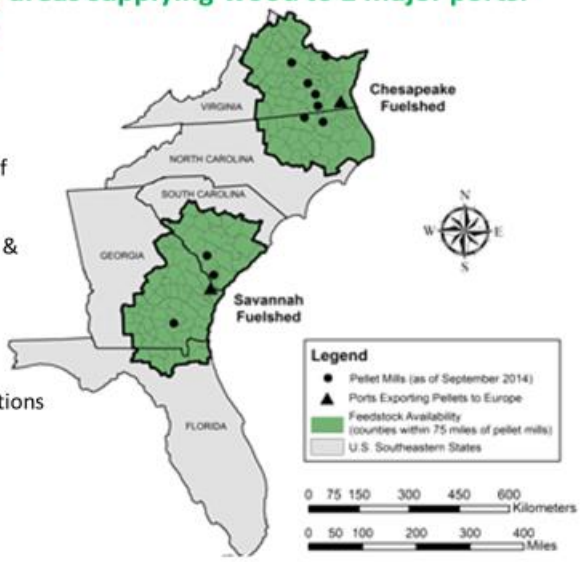
Considered 2 case study areas supplying wood to 2 major ports:

Fuelsheds: Counties within 120 km (75 miles) of pellet mills that supply ports

Each fuelshed area has an area of ~12 million ha.

Chesapeake Fuelshed: both pine & mixed hardwoods
- 33 NC counties
- 69 VA counties

Savannah Fuelshed: mostly intensively managed pine plantations
- 22 SC counties
- 54 GA counties
- 7 FL counties



Dale, Parish, Kline, Tobin (2017) How is wood-based pellet production affecting forest conditions in the southeastern United States? *Forest Ecology and Management* 396: 143-149.

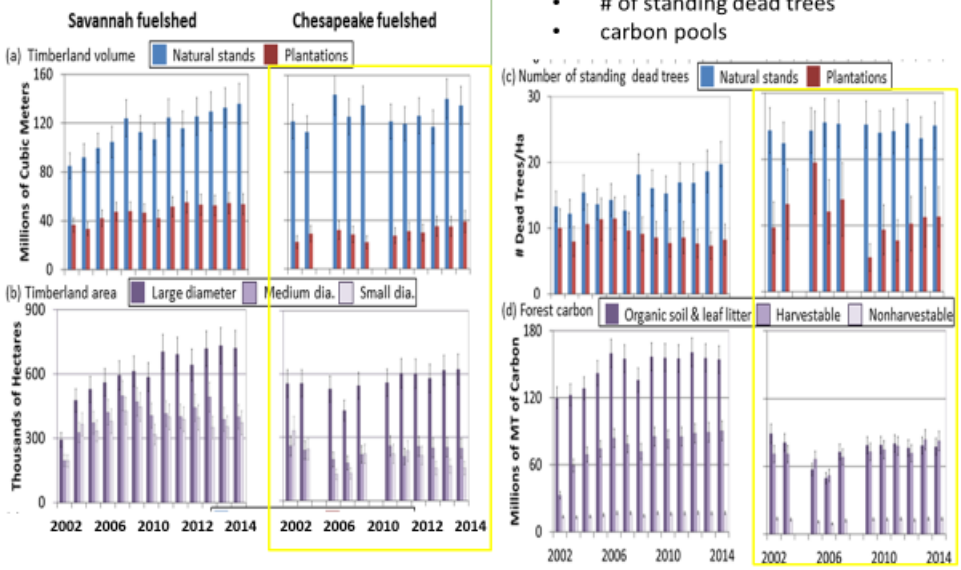
Parish, Dale, Kline and Tobin (2017) Dataset of timberland variables used to assess forest conditions in two Southeastern United States' fuelsheds. *Data in Brief* 13: 278-290.

Ten timberland variables pulled from FIA data

Variable Name	Variable Description
Vol Nat	Volume of Natural stands (millions of cubic meters)
Vol Plan	Volume of Plantations (millions of cubic meters)
Area LD	Area of Large Diameter stands (thousands of hectares)
Area MD	Area of Medium Diameter stands (thousands of hectares)
Area SD	Area of Small Diameter stands (thousands of hectares)
StDead Nat	Standing Dead trees in Natural stands (number per hectare)
StDead Plan	Standing Dead trees in Plantations (number per hectare)
Carbon SLL	Carbon stored in Soil & Leaf Litter (millions of metric tons)
Carbon HM	Carbon stored in Harvestable (live) woody Material (millions of metric tons)
Carbon NHM	Carbon stored in NonHarvestable (dead) woody Material (millions of metric tons)

From Parish, Dale, Kline, Tobin (2017) *Data in Brief*

Are pellet exports affecting SE US forests?



Analyzed FIA data for changes in:

- timberland volume & area (natural vs. plantation)
- tree diameters
- # of standing dead trees
- carbon pools

Results of ORNL's assessment of SE US timberland characteristics pre- and post- export pellet production in 2009

Note that the Chesapeake fuelshed is most similar to Maryland forests

Timberland Characteristic	Savannah Fuelshed	Chesapeake Fuelshed
Naturally regenerating stand volume	Increased	No change
Plantation volume	Increased	Increased
Large-diameter tree area	Increased	Increased
Medium diameter tree area	No change	No change
Small diameter tree area	No change	No change
Standing dead tree density of natural stands (#/ha)	Increased	No change
Standing dead tree density of plantations (#/ha)	Decreased	No change
Carbon content of soil and leaf litter	Increased	No change
Carbon content of live harvestable material	Increased	Increased
Carbon content of dead non-harvestable material	Increased	No change

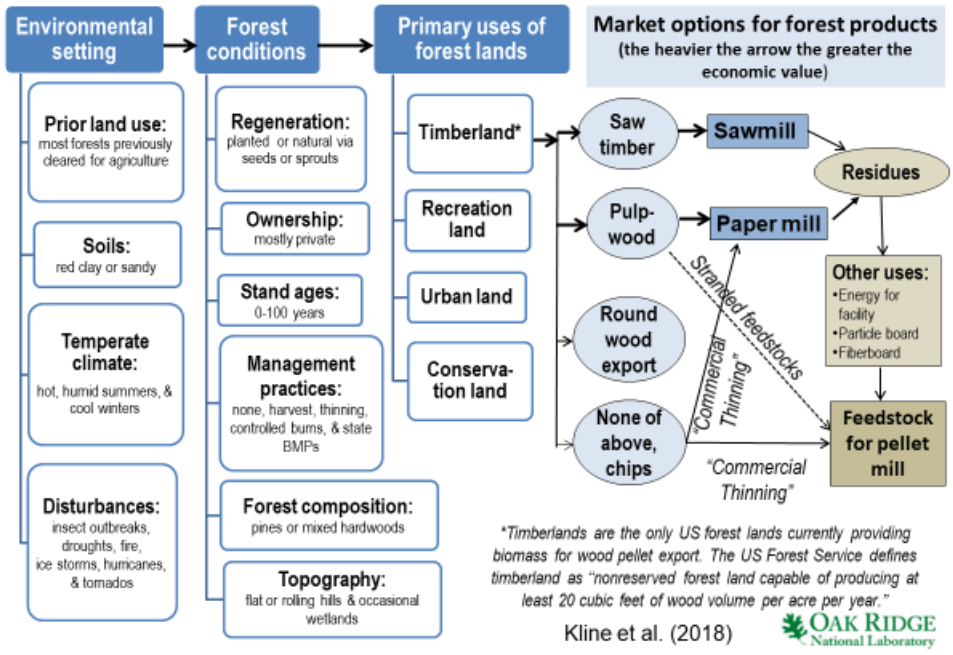
Dale et al. (2017) Forest Ecology and Management 396: 143-149.

Parish, Dale, Kline (2017) Has pellet production affected Southeastern US forests? *World Biomass* p. 38-42. http://www.dcmproductions.co.uk/flippages/flipbook/index.html?page=40

Wood markets are needed to retain SE US land in forest.

The greatest cause of forest loss in the SE US is development (Wear & Greis 2013)

Influences on SE US export wood pellet production



*Timberlands are the only US forest lands currently providing biomass for wood pellet export. The US Forest Service defines timberland as "nonreserved forest land capable of producing at least 20 cubic feet of wood volume per acre per year."

Kline et al. (2018)

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Biomass stranded without markets ("unloved wood")

- Eventually burns or decays
- Reduces incentives to keep private lands forested

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Situation in Tennessee

- Papermills shut down and were not replaced by an alternative demand for wood.
- There are no pellet plants.
- The abundance of low value wood is one of the top. challenges for Tn according to the Tn Department of Forestry.
- Concern about insect outbreaks and fires is high.
- Development is the main cause of forest loss, and that wood is often burned.

Gatlinburg Fire

Biomass stranded without markets ("unloved wood")

- Eventually burns or decays
- Reduces incentives to keep private lands forested

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Pellet production allows forest owners to conduct forest management (e.g., thinning) that reduces risks of fire & insect outbreaks

A

B

Parish, Dale, Kline (2017) *World Biomass*

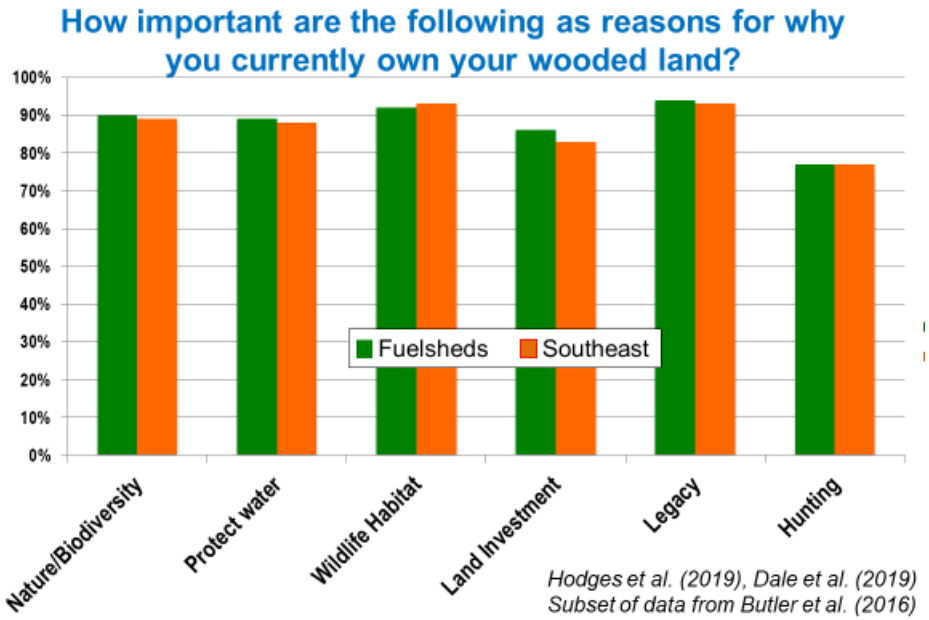
Consideration of noncorporate forest land owners' perspectives regarding wood-based energy

Survey of ~900 family forest land owners in eastern US on biomass for energy:

- **Concern for the environment is paramount**
- **Potential impacts on existing industries are a concern**
- **There was a willingness to support use of biomass for energy as long as**
  1. Land health is not compromised
  2. The price is right

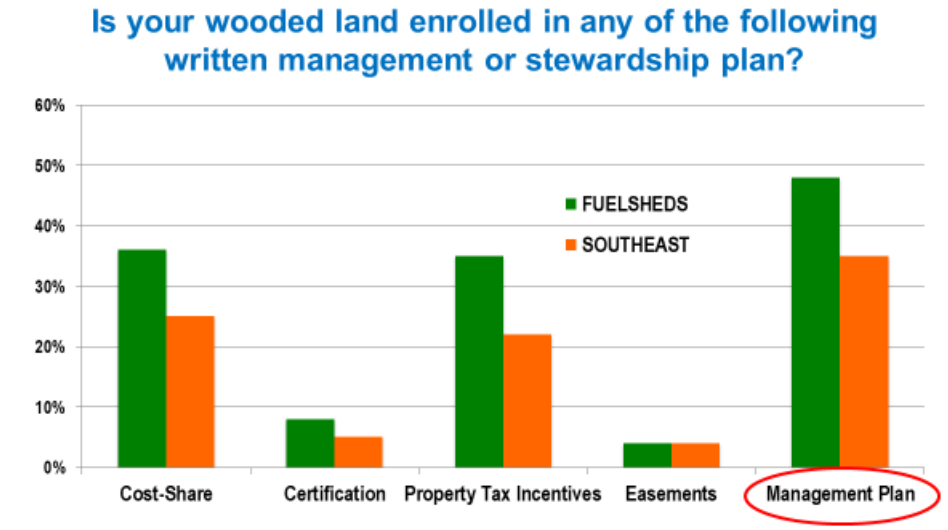
Hodges et al. (2019), Dale et al. (2019)

There is little difference between owners in fuelsheds and in SE regarding reasons for owning forests



Hodges et al. (2019), Dale et al. (2019)
Subset of data from Butler et al. (2016)

There is difference between owners in fuelsheds and in SE regarding management plans



Hodges et al. (2019), Dale et al. (2019)
Subset of data from Butler et al. (2016)

Diverse reasons that landowners keep their land in forest in two fuelsheds

Views on effects of markets & policy on willingness to sell biomass for energy

(HWB = harvesting woody biomass)

Hodges et al. (2019), Dale et al. (2019)

Benefits of logger training

- Only 17% of harvested wood is certified in SE US
- Yet, mills that export pellets require feedstock to originate from sites supervised by foresters trained in habitat conservation, water quality, & other BMPs (best management practices).
- Logger training is a component of the Sustainable Forestry Initiative's (SFI's) certified Fiber Sourcing Standard.
- **Focus on forests attributes rather than paperwork.**

Pellet mill in Ahoskie, NC

Dale + 34 coauthors (2017) GCB-Bioenergy

Benefits of producing wood pellets in the SE US

- **Provide rural jobs**
- **Mitigate climate change**
  - By replacing coal
  - By enhancing forest sequestration in forests with improved management
- **Reduce inefficiencies**
- **Improve forest habitat**
- **Retain forests**
  - As demand for wood increases, net forest area typically expands
- **Decrease risks of**
  - Insect outbreaks & disease
  - Destructive wildfire

Cowie et al. (2013) IEA Bioenergy
Dale + 34 authors (2017) GCB Bioenergy
Hodges et al. (2019) RSER
Forest2Market (2017)
Miner et al. (2014) Journal of Forestry
Parish et al. (2018) Ecology & Society

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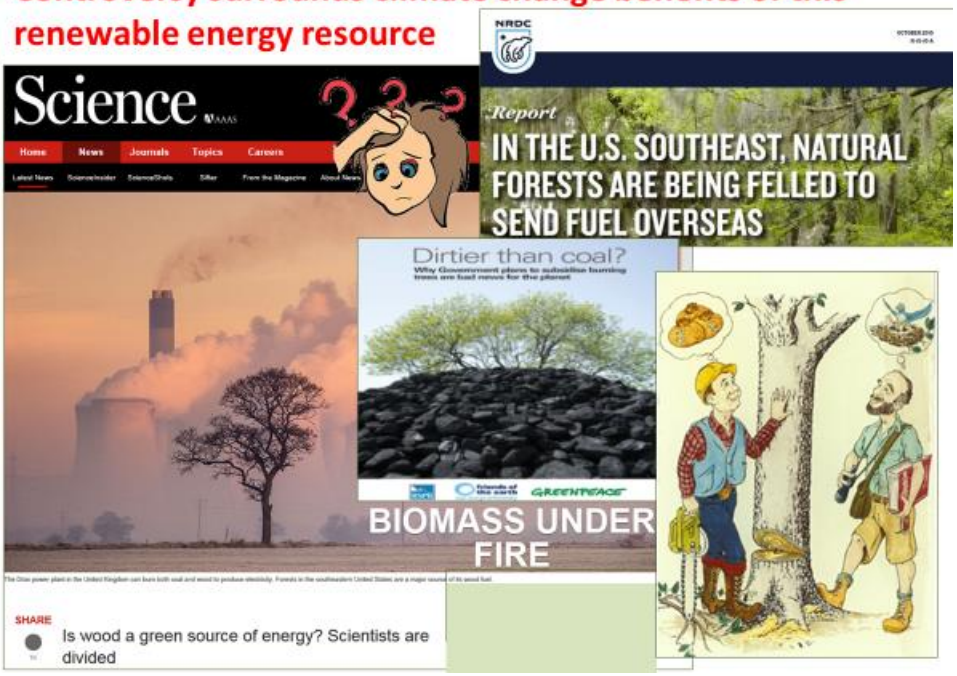
Controversy surrounds climate change benefits of this renewable energy resource



Misconceptions about climate effects of forest bioenergy

Misconceptions are due to

1. ***Wide diversity of bioenergy systems and associated contexts***
2. ***Differences in assessment methods as influenced by***

A. *Narrow time perspective*:

1) The most important climate change mitigation action is keeping fossil carbon in the ground by transforming energy, industry, & transport systems.
2) Narrow perspectives obscure the significant role that bioenergy plays in displacing fossil fuels & supporting energy system transition.

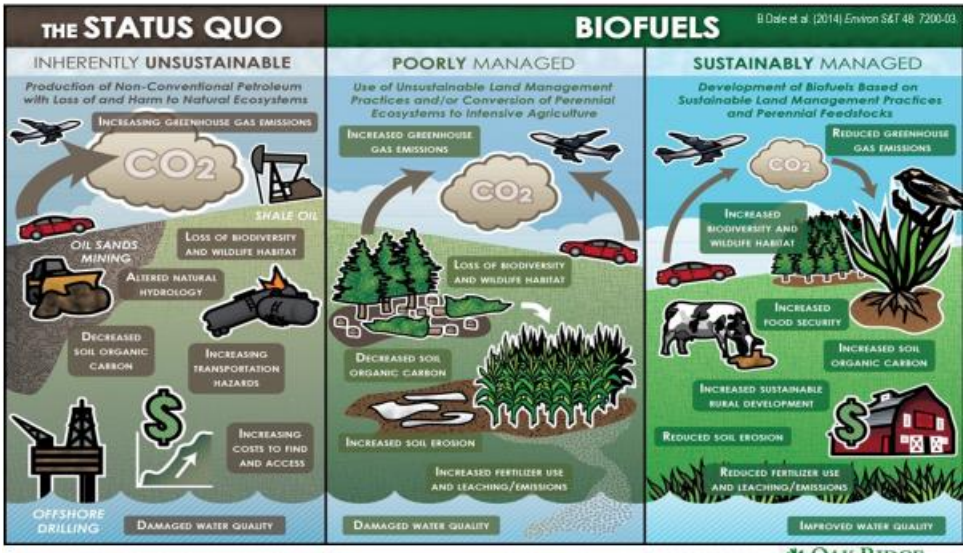
B. Lack of system perspective:

1) Shouldn't focus on carbon balance of individual forest stands
2) Shouldn't compare emissions at the point of combustion or neglect system interactions influencing climate effects of forest bioenergy.
3) Instead
   - Consider the full life cycle of bioenergy systems, including effects of the associated forest management & harvesting on broad-scale carbon balances;
   - Identify how forest bioenergy can best support energy-system transformation required to achieve climate goals;
   - Incentivize forest bioenergy systems that augment the mitigation value of the forest sector

C. Reference (counterfactual) scenarios need to be realistic & provide the same services

Source: Cowie et al. 2021

Appropriate Management of Biofuels can Support Sustainability Goals



Source: Bruce Dale et al. (2014)

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