Energy Justice Network

February 17, 2015

Comments to Senate Finance Committee

OPPOSING

Senate Bill 154
Renewable Energy Portfolio Standard – Thermal Energy

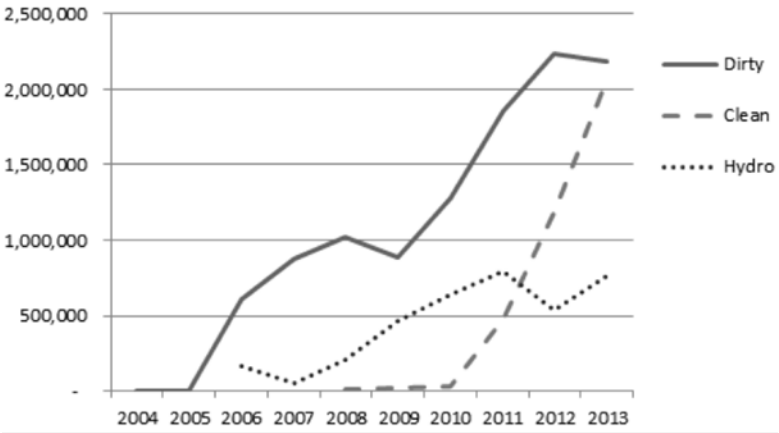
Mike Ewall, Esq.
Founder & Director
Energy Justice Network
430 M St. SW #N406
Washington, DC 20024
215-436-9511
mike@energyjustice.net
www.EnergyJustice.net

Good afternoon. My name is Mike Ewall, and I'm the founder and director of a national organization called Energy Justice Network. Energy Justice works at the local level with grassroots community groups throughout Maryland and the rest of the country to support efforts to stop polluting and unnecessary energy and waste industry facilities, with a focus on incineration.

When people think of renewable energy, they think of (and want) just wind and solar. **Maryland has one of the dirtiest renewable energy mandates in the nation. Over the first decade of Maryland's RPS, 60% of the Tier I requirements came from smokestack technologies, and only 21% from wind and solar.** Maryland is the only state to put trash incineration – which is far dirtier than coal by every measure – in Tier I, on par with wind.

Maryland's RPS does NOT need help being dirtier!
The dirty portion below is all from biomass and waste incineration, including burning of trash, trees, black liquor, and toxic landfill gases. The clean portion is mostly wind with a small bit of solar.

Maryland Tier I RPS credits in a nutshell:



Sen. Middleton's 2014 Thermal Biomass bill was better.
Last year, his bill (SB 530) at least had some good features, removing biomass from Tier I, eliminating burning of construction/demolition wood waste and black liquor, and ending co-firing of biomass in coal power plants. Sadly, these provisions were removed, leaving nothing good in this bill, environmentally or economically.

Dirty "Renewable Energy" in Maryland

In 2013, the latest data available, 44% of the Tier I "renewables" used to meet Maryland's Renewable Energy Portfolio Standard were from smokestack (combustion) technologies, down from a historical average of 60% over the first decade of the policy. Wind and solar added up to 41% of Tier I – less than the total from the air-polluting sources.

15% was hydroelectric power, which we don't consider "clean" or meaningful since, unlike wind and solar that are newly developed and make an impact displacing other sources, hydroelectric dams (environmental impacts aside) are old, existing facilities that were paid off many years ago. Diverting ratepayer funds to buy renewable energy credits (RECs) from them makes no difference for the environment. It doesn't help keep them open (they're not as risk of closure), nor does it increase their capacity. It just takes extra ratepayer money that should otherwise go to developing new wind and solar and puts it in the pockets of the utilities that own dams.

Of the combustion technologies, black liquor comprised 23% of the total RECs used to comply with the RPS law in 2013, trash incineration made up 11%, landfill gas 5%, biomass 3%, and blast furnace gas 1%. **All of these are polluting and dangerous and most are worse than coal for the climate, if not also for many other pollutants.**

Source: PJM Environmental Information Services, Generation Attribute Tracking System (GATS), "RPS Retired Certificates (Reporting Year)," www.pjm-eis.com/reports-and-news/public-reports.aspx

WHAT THE BILL DOES: It adds a new Thermal Tier requirement on the state's electric suppliers to buy "Thermal Renewable Energy Credits" from the following sources, provided they're new since 1/1/2015 and in Maryland:

- Geothermal heating and cooling systems (which are good, but are already an option in the Tier I requirements)
- Animal manure biomass – incinerating or digesting poultry litter along with food waste or other biomass
- Woody biomass – incinerating crops, trees, or untreated wood waste, or gases or liquid produced from them
    - Woody biomass must be 65% efficient unless burning high-moisture fuels, in which case they need only be 50% efficient.

New RPS Timetable (bold = new to this bill)

Year	Tier I	Tier II	**Thermal Tier**	Solar (part of Tier I)	Off-Shore Wind
2014	10.3%	2.5%			
2015	10.5%	2.5%		0.50%	
2016	12.7%	2.5%	**0.10%**	0.70%	
2017	13.1%	2.5%	**0.25%**	0.95%	<0.25%
2018	15.8%	2.5%	**0.38%**	1.40%	<0.25%
2019	17.4%		**0.50%**	1.75%	<0.25%
2020	18.0%		**0.75%**	2.00%	<0.25%
2021	18.7%		**1.00%**	2.00%	<0.25%
2022	20.0%		**1.20%**	2.00%	<0.25%
2023	**20.0%**		**1.40%**	**2.00%**	**<0.25%**
2024	**20.0%**		**1.70%**	**2.00%**	**<0.25%**
2024+*	**20.0%**		**2.00%**	**2.00%**	**<0.25%**

* the bill mistakenly says "2024 and later" where it should read "2025 and later"

Tier I: solar, wind, ocean, hydroelectric smaller than 30 megawatts, landfill gas, anaerobic digester gas, fuel cells running on landfill gas or anaerobic digester gas, incineration of trash (or fuel derived from trash), poultry waste incineration

Tier II: hydroelectric that isn't pumped storage. Tier I can be used to meet Tier II. Tier II used to include trash incineration until 2011, when that was moved to Tier I – an awful precedent that must be reversed.

RECOMMENDED ACTIONS: Oppose this dirty bill and replace it with one that includes the good elements of Senator Middleton's 2014 Thermal Energy bill (SB 530 of 2014), removing black liquor, wood waste, and co-firing (of biomass with coal or other fuels), and cap the use of combustion technologies in Tier I at 2013 levels, as SB 760 does.

HOW A THERMAL TIER OUGHT TO BE STRUCTURED: SB 154 mixes up energy sectors: the Renewable Portfolio Standard is supposed to shift the *electricity* sector to "clean" sources. The heating sector is a different energy consumption sector. The percentage requirements for a thermal tier should be applied to the heating sector, not taken out of the RPS requirements for the electricity sector. There ought to be separate policy that encourages clean heating alternatives.

The environmentally sound solutions for the heating sector are (in priority order): conservation, efficiency, solar (passive, thermal and hot water), and heat pumps – either ground source (geothermal) or air-source (like reversible window air conditioners). One especially inspiring example is in the (very cold) Town of Okotoks, Alberta, Canada, where 90% of the heating needs of an entire development are met with community solar thermal. See www.dlsc.ca

PROBLEMS WITH BIOMASS: Biomass heating, whether at a residential or industrial scale, is polluting. The bill's safeguards against burning treated wood are unenforceable, since co-firing is permitted, allowing a company that burns treated wood with untreated wood to qualify and count more of their energy than they ought to be allowed to count.

It is important to recognize that biomass combustion technologies are expensive, polluting, unhealthy and unnecessary. We urge you to study the problems with these other dirty fuels. There are far cheaper (and environmentally safe) alternatives to heating spaces and for managing poultry litter, and none of them involve combustion.

For more information, see:
Biomass: www.energyjustice.net/biomass/
Residential wood stoves: www.burningissues.org
Poultry waste incineration: www.energyjustice.net/fibrowatch/

FACT SHEET: Woody Biomass Incineration

Biomass: Expensive and Unnecessary

Burning woody "biomass" may technically be renewable, if trees are replanted, but it is not clean or needed. By most measures, biomass incineration is more polluting than coal.

Through conservation, efficiency, wind, solar and energy storage, we can meet all of our energy needs without needing nuclear power, or the burning of biomass, waste or fossil fuels.[1,2] Biomass is one of the most expensive ways to make electricity, second only to trash incineration.[3] Money wasted on biomass would go further and create more jobs if spent on demand reduction and zero-emission renewables, yet renewable energy mandates and subsidies undermine clean solutions whenever they support biomass.

"Renewable" Doesn't Mean Clean

Burning biomass emits particulate matter (PM), nitrogen oxides (NO_X), carbon monoxide (CO), carbon dioxide (CO_2), sulfur oxides (SO_X), toxic heavy metals (such as arsenic, mercury, lead, cadmium and chromium), acid gases, dioxins and furans, volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), other hazardous air pollutants (HAPs), and even radioactive pollutants.

A typical 50 megawatt biomass incinerator permitted between 2008 and 2012 has expected annual emissions of 230 tons of nitrogen oxides, 248 tons of carbon monoxide, 85 tons of particulate matter, 40 tons of volatile organic compounds, and 25 tons of hazardous air pollutants.[4] Emissions of toxic metals and dioxins can be even higher if more contaminated types of biomass are burned, such as painted or treated construction / demolition wood waste. EPA recognizes that even the best-performing biomass plants emit as much or more air pollution as coal plants.[5]

Dirtier Than Coal

By most of these measures (with notable exceptions on sulfur and mercury), burning biomass is as polluting or worse than burning coal, and far worse than natural gas. For some pollutants, this is because biomass is actually more contaminated than coal. In other cases, burning one ton of biomass may release less of a pollutant than burning one ton of coal, but since about two tons of biomass must be burned to create the same energy as one ton of coal, biomass can be more polluting per amount of energy produced. A third reason biomass is often more polluting than coal is that the regulatory requirements for air pollution controls on biomass facilities are weaker, so even where burning two tons of trees would produce less pollution than one ton of coal, the air pollution from the tree burner may be greater because it is not required to capture as much of its pollution as the coal power plant must.

The latest EPA data shows that biomass emits 98% as much NOx as bituminous coal, 51% more CO_2,[6] and comparable levels of particulate matter – but biomass is worse for small particulate matter (PM10) and far worse for the finest and most dangerous particulate matter (PM2.5).[7] Dioxins (the most toxic chemicals known to science) are released at rates 7 times higher than coal, and 167 times higher if burning salt-laden wood, like marine pilings.[8]

The "Carbon-Neutral" Myth

Biomass burning releases 51% more CO_2 than coal, creating a carbon debt that is not overcome for decades. It takes 40 years of trees grown to replace those burned in order to suck up enough CO_2 so that the biomass is *as bad as* coal – and centuries before it can be called "neutral."[9] However, these trees are unlikely to be left undisturbed for so many decades, making "carbon-neutrality" a fantasy. Unfortunately, we do not have decades to waste. Biomass burning cooks the climate faster than coal, and the atmosphere reacts the same whether the extra pulse of CO_2 came from a "biogenic" source or not. It is critical that we avoid global warming tipping points in the coming decades.

Bait and Switchgrass – Burning Toxic Wastes

"Green" biomass is often a foot in the door for more toxic waste streams. Biomass incinerators that start off burning "clean wood chips" often seek to burn more contaminated fuels like construction / demolition wood waste, tires, plastics or trash, since the facilities can get paid to take these wastes, rather than pay for their fuel. Economic pressures encourage use of dirtier fuels.

Keeping Coal Alive

Biomass co-firing at existing coal power plants is often proposed to keep coal plants alive that would otherwise close due to the expense of pollution control upgrades. This is encouraged by renewable energy policies and by regulatory loopholes that ignore biomass CO_2 emissions.

"Clean Wood" Isn't Clean

Even "clean" wood, straight from a forest, is contaminated with pollutants that trees absorb from the environment and can become significant sources of toxic pollution when burned. Some trees are especially good at taking up mercury, particularly willow and poplar (two species widely promoted for biomass use). When accounting for the lack of requirements for mercury controls on biomass plants, a wood burning biomass plant can release more mercury per unit of energy than a coal power plant with mercury controls.

Lead, cadmium, copper, iron and zinc are also taken up by trees.[10,11] Pine and larch are well-known accumulators of lead, and willow is considered a hyperaccumulator of cadmium.[12] Lead and cadmium are highly toxic and large portions (23% of lead and 60% of cadmium) can escape pollution controls and get into the air when burned.[13] Copper, iron and zinc are catalysts for dioxin formation and will boost the toxicity of the air emissions and ash.[14] Researchers have found that toxic metal concentrations in normal wood ash are "disturbingly high" when tested[15] and would be classified as hazardous waste in Europe,[16] and have been turned away from normal landfills in Germany.[17]

When the small (12-megawatt) Bio Energy plant in Hopkinton, New Hampshire was burning clean wood chips, from 1983 to 2002, it annually emitted about 600 pounds of lead and 8 pounds of mercury, "apparently naturally occurring in trees or absorbed through the soil," according to the state Department of Environmental Services.[18]

Wood Waste

So-called "wood waste" is often promoted as woody biomass. This could include cuttings from lumber mills or unused portions of trees from logging operations. Diverting lumber mill wood waste to biomass burners displaces that wood from its previous use (often already burned on-site for biomass or reused in pulp or paper-making), causing indirect pressure on forests as new logging is needed to fill the replace that wood's previous use. Woody material considered "waste" from logging is not waste, but provides habitat for small mammals when left on the forest floor and should be left for the forest to recover.[19]

Construction / Demolition / Disaster Debris

Another common type of "wood waste" is construction and demolition debris (known as "C&D"). With help from global warming-induced natural disasters, an increasing amount of disaster debris now also fits in this category. Utility poles, railroad ties, wood pallets and marine pilings carry similar dangers. On average, 13% of C&D waste is wood. Much of that wood is contaminated, both with non-wood materials that isn't well-separated, and with contaminants found in treated and painted wood.

Wood waste can come contaminated with wood preservatives, binders, paints, glues, chlorine bleach, plastic laminating materials, chlorinated adhesives, or phenol and urea formaldehyde resins, nails/staples, or other non-wood materials. Treated woods are usually coated with creosote, pentachlorophenol, or chromated copper arsenate (CCA). Pentachlorophenol is a chlorinated compound that is contaminated with dioxin and creates more dioxin when burned. CCA, the most widely used wood treatment chemical, releases arsenic when burned and the chromium in the wood is converted to the toxic form (chromium VI) when burned. The copper in CCA (and in the new, arsenic-free, wood treatment chemicals) boosts dioxin when burned. It is difficult to sort out CCA-treated wood. Even where workers are specially trained to remove it, contamination rates of 9-10% have been found in the allegedly CCA-free wood piles. Contamination rates of 5% are enough for the ash to be considered hazardous waste, and rates of 1-2% still result in significant toxic metal emissions.[20] Although arsenic is no longer used in new wood treatment, this will be a problem for decades to come as it takes many years before treated wood hits the waste stream.[21]

Old painted wood can contain lead and mercury. While lead in paint was phased out in 1978 and mercury in 1991, this toxic painted wood can still end up in wood waste stream from demolition and remodeling of older homes. One biomass incinerator that threatened to reopen to burn C&D wood in Hopkinton, New Hampshire was permitted in 2003 to release an astounding 2.6 tons of lead per year and up to 31 pounds of mercury (nearly four times the mercury released when the plant burned "clean wood chips").[22,23]

Biomass Incineration's Polluting Impacts

Biomass ash contains toxic metals and dioxins and should be handled as hazardous waste, not as fertilizer, though it sometimes is, resulting in contamination of farms.[24,25] A 2012 Wall Street Journal analysis found that 80% of U.S. biomass incinerators have been cited for air or water violations in the past five years.[26]

Medical & Health Professionals Speak Out

Numerous medical professionals have come out opposed to biomass incineration, due to the health effects of biomass air pollutants, including the American Academy of Family Physicians, American Lung Association, Washington State Medical Association and the Massachusetts Medical Society.[27] Read their statements and others' online at: http://www.energyjustice.net/biomass/health/

---

[1] "Near-Term Practical and Ultimate Technical Potential for Renewable Resources – DRAFT," National Renewable Energy Laboratory , January 16, 2006. http://www.energyjustice.net/files/solutions/NREL_Renew.pdf

[2] Mark Jacobson, "A Plan for a Sustainable Future: How to get all energy from wind, water and solar power by 2030," Scientific American, November 2009. http://www.stanford.edu/group/efmh/jacobson/Articles/I/susenergy2030.html

[3] "Updated Capital Cost Estimates for Electricity Generating Plants," Energy Information Administration, November 2010, p.7, Table 1. http://www.eia.gov/oiaf/beck_plantcosts/ (direct link: http://www.eia.gov/oiaf/beck_plantcosts/pdf/updatedplantcosts.pdf).

[4] "'Renewable' biomass power cuts forests, pollutes the air, drains rivers, and worsens global warming," Partnership for Policy Integrity biomass factsheet, April 2012. http://www.pfpi.net/wp-content/uploads/2012/04/PFPI-biomass-factsheet.pdf

[5] *Id*., note 3.

[6] eGRID 2012 Database, U.S. Environmental Protection Agency, 2009 data released on 5/10/2012. http://www.epa.gov/cleanenergy/energy-resources/egrid/

[7] U.S. EPA WebFIRE Application. http://cfpub.epa.gov/webfire/

[8] "An Inventory of Sources and Environmental Releases of Dioxin-Like Compounds in the United States for the Years 1987, 1995, and 2000," U.S. EPA, November 2006, Table 1-14. http://cfpub.epa.gov/ncea/CFM/recordisplay.cfm?deid=159286

[9] Manomet Center for Conservation Sciences, "Biomass Sustainability and Carbon Policy Study," June 2010, p.26, Exhibit 2-7. http://www.manomet.org/manomet-study-woody-biomass-energy; see also studies available under global warming section in the sidebar at http://www.energyjustice.net/biomass/

[10] Danny R. Jackson, William J. Selvidge and Beverly S. Ausmus, "Behavior of heavy metals in forest microcosms," Water, Air & Soil Pollution 10 (1978) 3-11. http://www.springerlink.com/content/u46p0735345t6053/

[11] Clemens Reimanna, Rolf Tore Ottesen, Malin Andersson, Arnold Arnoldussen, Friedrich Koller, Peter Englmaier, " Element levels in birch and spruce wood ashes: green energy?" Science of the Total Environment 393 (2008) 191-197. http://www.sciencedirect.com/science/article/pii/S0048969708000429

[12] *Id*.

[13] Michal Šyc, Michael Pohorelý, Petra Kameníková, Jan Habart, Karel Svoboda, Miroslav Puncochár, "Willow trees from heavy metals phytoextraction as energy crops," Biomass and Bioenergy, 2012;37:106–113. http://www.sciencedirect.com/science/article/pii/S0961953411006441

[14] Mike Ewall, "Metals as Catalysts for Dioxin Formation," (compilation of over a dozen published research papers documenting the phenomenon), December 2003. http://www.ejnet.org/dioxin/catalysts.html Copper is the most potent catalyst.

[15] Note 11 *supra*.

[16] Ribbing C., "Environmentally friendly use of non-coal ashes in Sweden," Waste Management 27 (2007) 1428–35. http://www.sciencedirect.com/science/article/pii/S0956053X07001092

[17] K. Pohlandt-Schwandt, "Treatment of Wood Ash Containing soluble chromate," Biomass and Bioenergy 16 (1999) 447-462. http://www.sciencedirect.com/science/article/pii/S0961953499000136

[18] Stephanie Ebbert, "N.H. plant's plan to burn debris fuels town fears," Boston Globe, September 20, 2004. http://www.boston.com/news/local/articles/2004/09/20/nh_plants_plan_to_burn_debris_fuels_town_fears/

[19] "Forestry's Waste Wood Offers Habitat for Small Forest-Floor Animals," ScienceDaily (Oct. 24, 2012). http://www.sciencedaily.com/releases/2012/10/121024124625.htm

[20] Monika Blassino, Helena Solo-Gabriele & Timothy Townsend, "Pilot scale evaluation of sorting technologies for CCA treated wood waste," Waste Manage Res 2002: 20: 290–301, 297. http://wmr.sagepub.com/content/20/3/290.abstract

[21] Timothy Townsend & Helena Solo-Gabriele, "New Lines of CCA-Treated Wood Research: In-Service and Disposal Issues," March 19, 2001, pp.36, 54 & 115. http://www.ccaresearch.org/solo-gabrielle_00-12.PDF

[22] Modification of Title V Operating Permit issued to Bio Energy LLC by New Hampshire Department of Environmental Services, July 25, 2003. http://www2.des.state.nh.us/OneStopPub/Air/3301300101FY03-0132TypePermit.pdf

[23] Note 18 *supra*.

[24] Tom Gascoyne, "Fly in the ashes: Waste from co-generation plant tests high for dioxins," Chico News & Review, July 5, 2012. http://www.newsreview.com/chico/fly-in-the-ashes/content?oid=6579788

[25] Note 11 *supra*.

[26] Justin Scheck & Ianthe Jeanne Dugan, "Wood-Fired Plants Generate Violations," Wall Street Journal, July 23, 2012. http://online.wsj.com/article/SB10001424052702303740704577524822063133842.html

[27] Medical and Health Associations Opposed to Biomass. Statements compiled at: http://www.energyjustice.net/biomass/health