

Department of Legislative Services
 Maryland General Assembly
 2019 Session

FISCAL AND POLICY NOTE
 Enrolled - Revised

Senate Bill 516
 Finance

(Senator Feldman, *et al.*)

Economic Matters

Clean Energy Jobs

This bill increases the State’s Renewable Energy Portfolio Standard (RPS) from 25% by 2020 to 50% by 2030 and makes other related changes. The expired Tier 2 of RPS is reestablished for two years, in 2019 and 2020. A total of \$15.0 million is transferred from the Strategic Energy Investment Fund (SEIF) for specified purposes. An existing study being conducted by the Power Plant Research Program (PPRP) is modified to include additional topics and a supplemental study on a 100% RPS goal. Separately, PPRP must also conduct a related study on nuclear energy.

Fiscal Summary

State Effect: State expenditures (all funds) increase by \$1.1 million in FY 2020, escalating to \$3.3 million in FY 2024. General fund expenditures increase by \$2.4 million in FY 2020 and by similar amounts through FY 2024. Special fund revenues/expenditures reflect required transfers and Public Service Commission (PSC) costs/assessments.

(\$ in millions)	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
SF Revenue	\$3.8	\$0.4	\$1.1	\$1.1	\$2.1
GF Expenditure	\$2.4	\$2.3	\$2.3	\$2.3	\$1.9
SF Expenditure	\$3.8	\$0.4	\$1.1	\$1.1	\$2.1
GF/SF/FF Exp.	\$1.1	\$1.7	\$2.2	\$2.8	\$3.3
Net Effect	(\$3.5)	(\$4.0)	(\$4.6)	(\$5.1)	(\$5.2)

Note: () = decrease; GF = general funds; FF = federal funds; SF = special funds; - = indeterminate increase; (-) = indeterminate decrease

Local Effect: Local expenditures increase beginning in FY 2020 due to higher electricity prices. Local revenues increase beginning in FY 2020 from taxes and fees associated with additional solar installations.

Small Business Effect: Meaningful.

Analysis

Bill Summary:

RPS Increase to 50% and Other Changes

Minimum RPS percentage requirements are increased beginning in 2019 and escalate to 50% by 2030, as shown in **Exhibit 1**. Associated alternative compliance payments (ACPs) are reduced beginning in that same year; by 2029, solar and nonsolar ACPs reach parity.

Exhibit 1 Annual Tier 1 RPS Specifications Under the Bill

<u>Year</u>	<u>Percentage of Retail Sales</u>				<u>Alternative Compliance Payments¹</u>			
	<u>The Bill</u>		<u>Current Law</u>		<u>The Bill</u>		<u>Current Law</u>	
	<u>Total²</u>	<u>Solar</u>	<u>Total</u>	<u>Solar</u>	<u>Nonsolar</u>	<u>Solar</u>	<u>Nonsolar</u>	<u>Solar</u>
2019	20.70%	5.50%	20.40%	1.95%	\$30.00	\$100.00	\$37.50	\$150.00
2020	28.00%	6.00%	25.00%	2.50%	30.00	100.00	37.50	125.00
2021	30.80%	7.50%	25.00%	2.50%	30.00	80.00	37.50	100.00
2022	33.10%	8.50%	25.00%	2.50%	30.00	60.00	37.50	75.00
2023	35.40%	9.50%	25.00%	2.50%	30.00	45.00	37.50	60.00
2024	37.70%	10.50%	25.00%	2.50%	27.50	40.00	37.50	50.00
2025	40.00%	11.50%	25.00%	2.50%	25.00	35.00	37.50	50.00
2026 ³	42.50%	12.50%	25.00%	2.50%	24.75	30.00	37.50	50.00
2027	45.50%	13.50%	25.00%	2.50%	24.50	25.00	37.50	50.00
2028	47.50%	14.50%	25.00%	2.50%	22.50	25.00	37.50	50.00
2029	49.50%	14.50%	25.00%	2.50%	22.50	22.50	37.50	50.00
2030+	50.00%	14.50%	25.00%	2.50%	22.35	22.35	37.50	50.00

RPS: Renewable Energy Portfolio Standard

¹Dollars per megawatt-hour.

²Total columns include solar and offshore wind and reflect Tier 1 only. The bill also reestablishes Tier 2 at 2.5% in 2019 and 2020 (not shown).

³New offshore wind capacity is required beginning with at least 400 megawatts in 2026, increasing to at least 800 megawatts in 2028, and to at least 1,200 megawatts in 2030.

Other RPS changes include:

- The expired Tier 2 of RPS is reestablished for two years, in 2019 and 2020.
- The threshold for a potential solar cost control administrative action by PSC is increased from 2.5% of an electricity supplier's retail sales to 6.0%.
- For electric cooperatives only, the solar portion of the Tier 1 requirement is 2.5% beginning in 2020 (*i.e.*, other sources can be used to meet more of the Tier 1 requirement).
- As part of an existing annual reporting requirement, electricity suppliers must document the level of participation of minority business enterprises (MBEs) and minorities in the activities that support the creation of renewable energy credits (RECs).

ACP revenue must still be used to support new renewable energy sources in the State, but under the bill, the renewable energy sources also must be owned by or directly benefit low-income residents.

New Offshore Wind Applications

The existing offshore wind application and approval process is bifurcated into "Round 1" and "Round 2" projects, to allow for new applications. PSC must provide Round 2 application periods beginning, respectively:

- January 1, 2020, for consideration of Round 2 projects to begin creating offshore wind renewable energy credits (ORECs) no later than 2026;
- January 1, 2021, for consideration of Round 2 projects to begin creating ORECs no later than 2028; and
- January 1, 2022, for consideration of Round 2 projects to begin creating ORECs no later than 2030.

The Department of Legislative Services (DLS) notes the potential for these three phases to overlap, given existing timelines for project review and approval in current law.

The maximum combined ratepayer impacts from all Round 2 projects is \$0.88 per month (in 2018 dollars) for an average residential customer (1,000 kilowatt-hours per month) and 0.9% for nonresidential customers. Round 2 ratepayer impacts are in addition to the \$1.50/1.5% residential/nonresidential monthly maximums allowed under the existing (Round 1) process. Otherwise, the PSC review and approval process is generally the same or similar. Differences include that Round 2 projects must be located 10 to 80 miles off the coast of the State, instead of 10 to 30 miles, further emphasis is placed on MBE

participation (as supported by a disparity study), and projects are subject to a community benefit agreement, as defined. PSC must report annually on related information.

SEIF Transfers for Various Clean Energy Initiatives

The Maryland Energy Administration (MEA) must use SEIF to provide \$7.0 million in funding for access to capital for small, minority, women, and veteran-owned businesses in the clean energy industry under the Small, Minority, and Women-Owned Businesses Account (SMWOBA) in Commerce, subject to specified conditions, including an annual reporting requirement. The funding must be allocated in annual increments from fiscal 2021 through 2028, as specified. A related authorization (as opposed to the bill's requirement) is repealed.

MEA must also use SEIF to invest in pre-apprenticeship, youth apprenticeship, and registered apprenticeship programs to establish career paths in the clean energy industry under the Maryland Employment Advancement Right Now (EARN) program. Subject to specified requirements, starting in fiscal 2021, \$1.5 million must be transferred for grants to pre-apprenticeship jobs training programs and \$6.5 million must be transferred for grants to youth and registered apprenticeship jobs training programs until all amounts are spent.

The Clean Energy Workforce Account is established in the EARN program to receive and disburse the transfers as grants, subject to specified requirements, and a related reporting requirement is altered to incorporate the outcomes of the funding.

Renewable Energy Studies

An existing PPRP study on RPS required by Chapter 393 of 2017 is expanded to include (1) additional impacts related to in-state clean energy generation as an increasing percentage of RPS and (2) an assessment of the costs, benefits, and any legal or other implications of expanding the geographic eligibility for renewable sources, as specified. The final report must be submitted by December 1, 2019, in accordance with current law.

PPRP must also conduct a study of nuclear energy and its role as a renewable energy resource that can effectively combat climate change in the State, as specified. Among other requirements, the study must include (1) an assessment of the practicality of adding nuclear energy to Maryland's RPS and (2) recommendations regarding initiatives to responsibly and efficiently grow the nuclear energy industry in the State. PPRP must report its findings and recommendations to the Governor and the General Assembly by January 1, 2020.

After submission of the final RPS report, PPRP must conduct a supplemental study to assess the overall costs and benefits of increasing RPS to a goal of 100% by 2040. Particular subjects must include (1) all relevant subjects listed for the original study; (2) an

assessment of whether any in-state industries could be displaced or negatively economically impacted by a 100% RPS, with recommendations on how to transition workers and communities that rely on those industries; and (3) the findings and recommendations of the nuclear energy study required by the bill. On completion of the supplemental study, PPRP must use the findings to publish recommendations regarding the feasibility of implementing a 100% RPS by 2040. PPRP must submit the supplemental study to the Governor and the General Assembly by January 1, 2024.

Current Law/Background:

Renewable Energy Portfolio Standard – Generally

Maryland’s RPS was enacted in 2004 to facilitate a gradual transition to renewable sources of energy. There are specified eligible (“Tier 1”) sources as well as carve-outs for solar and offshore wind. Electric companies (utilities) and other electricity suppliers must submit RECs equal to a percentage specified in statute each year or else pay an ACP equivalent to their shortfall. The percentage requirements gradually increase to a minimum of 25%, including 2.5% from solar sources, by 2020. Prior to 2019, there was also a Tier 2 in RPS, with separate percentage requirements (2.5% annually). In 2019, the requirements are 20.4%, including at least 1.95% from solar energy.

In 2017, PSC approved two offshore wind projects through the process established in current law, which combined are estimated to produce almost the statutory maximum of 2.5% when they are both operational. The amounts count toward the overall Tier 1 requirements in a given year.

For more information, see the **Appendix – Maryland’s Renewable Energy Portfolio Standard**.

Likely Residential Customer Bill Effects

A range of *likely* average residential customer bill effects (1,000 kilowatt-hours per month) for the existing 25% RPS is shown in **Exhibit 2**. Based on currently available information, the likely range does not include the full potential range. DLS notes the following:

- The existing RPS is one year away from its maximum percentage requirements, and nonsolar REC prices have ranged from \$3 to \$15 over the past several years (out of a theoretical maximum of \$37.50 or \$40).
- While solar REC (SREC) prices have historically been more volatile, prices decreased significantly in 2015-2016 and have remained less than \$20 each for much of the time since. At some points, SREC prices have approached parity with nonsolar REC prices.

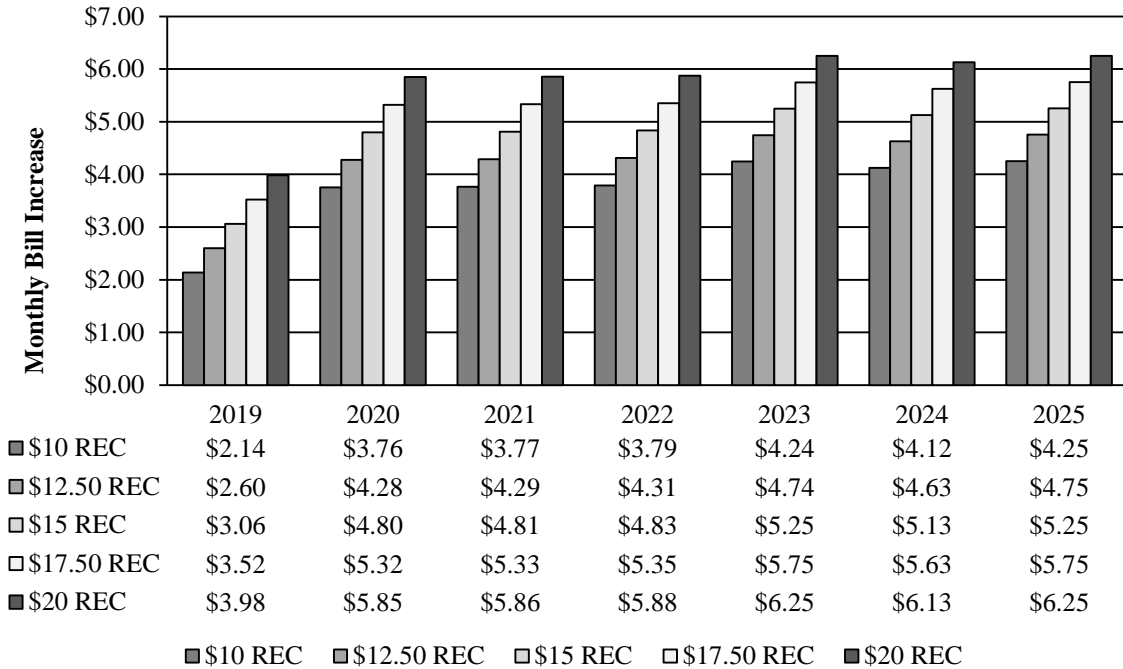
- Since nonsolar RECs make up the vast majority of total RPS requirements, the bill effects assume a fixed \$15 SREC price.
- The amounts are adjusted to reflect net costs associated with approved offshore wind projects beginning in 2020.

Strategic Energy Investment Fund

Chapters 127 and 128 of 2008 established SEIF primarily to receive revenue from Regional Greenhouse Gas Initiative (RGGI) carbon dioxide emission allowance auctions. The Acts also established an allocation of the revenue from the quarterly RGGI carbon dioxide emission allowance auctions to be distributed among various categories of spending. Other revenue in SEIF available from different fund sources is not subject to the allocation.

Generally, RGGI funds in SEIF support (1) energy assistance programs; (2) low- and moderate-income energy efficiency and other energy efficiency programs, (3) renewable energy, climate change, resiliency, and energy education programs; and (4) MEA administrative expenses. A detailed discussion of the funding allocations for SEIF can be found in the 2019 budget analysis for MEA on the DLS [website](#).

Exhibit 2
Existing RPS: Likely Average Residential Customer Monthly Bill Effect
By Nonsolar REC Price
Calendar 2019-2025+



Notes: The average residential customer uses 1,000 kilowatt-hours per month. The estimates assume a \$15 SREC price in each year; however, SRECs are about 10% of overall percentage requirements, and changes in their assumed price have a minor effect on total cost estimates. The dollar amounts shown are about 25% to 50% of the theoretical maximum in a given year. Bill impacts also reflect the addition of offshore wind in 2020.

RPS: Renewable Energy Portfolio Standard
 REC: Renewable Energy Credit
 SREC: Solar Renewable Energy Credit

Source: Department of Legislative Services

EARN Program

The EARN program was established in 2013 to create industry-led partnerships to advance the skills of the State’s workforce, grow the State’s economy, and increase sustainable employment for working families. Specifically, the program provides general fund grants

on a competitive basis for industry partnerships, workforce training programs, and job-readiness and skills training.

Small, Minority, and Women-Owned Businesses Account

State Law generally requires that 1.5% of video lottery terminal proceeds at each licensed video lottery facility be paid into SMWOBA. The account, which was established in 2007, is a special, nonlapsing fund that is administered by Commerce. The purpose of the account is to provide investment capital and loans to small, minority, and women-owned businesses in the State. At least 50% of such activity must be allocated to eligible businesses in the jurisdictions and communities surrounding a video lottery facility.

Power Plant Research Program

PPRP in the Department of Natural Resources (DNR) was created in 1971 to conduct research on the impacts of existing and proposed power plants in each county. PPRP is required to undertake a continuing research program for electric power plant site evaluation and related environmental and land use considerations. PPRP is funded through an assessment on electricity used in the State, which accrues to the Environmental Trust Fund (ETF).

State Fiscal Effect: Individual fiscal effects associated with various provisions of the bill are discussed separately below. Except where noted, State agencies can generally otherwise handle the bill's requirements with existing budgeted resources.

Electricity Costs

The incremental cost associated with the bill is absorbed by all electric customers in the State. As an electric customer, State agencies and the University System of Maryland use approximately 1.5 million megawatt-hours of electricity annually. This analysis assumes that RECs are \$10 under the bill, and would have been \$10 absent the bill, reflecting no substantive change in regional REC prices. It also assumes that SRECs are \$22 under the bill, when they would have otherwise been \$15 absent the bill, reflecting increased prices due to a substantial increase in demand. Each of these assumptions is subject to significant variation in a particular year, mostly depending on REC or SREC supply constraints.

Under these two assumptions, the bill increases State expenditures (all funds) by about \$1.1 million in fiscal 2020, \$1.7 million in fiscal 2021, \$2.3 million in fiscal 2022, \$2.8 million in fiscal 2023, and \$3.3 million in fiscal 2024. This reflects a rate increase ranging from \$0.59 to \$2.35 per megawatt-hour over that time, with an average rate of \$1.47 per megawatt-hour. DLS notes that an average residential customer uses approximately that amount of energy per month.

The costs reflect the following additional assumptions: (1) PSC does *not* waive solar compliance costs beyond 6.0% of retail sales; (2) sufficient RECs and SRECs are available in each year; and (3) no new offshore projects receive payments through 2025. Beyond fiscal 2024, costs will continue to increase as new offshore wind projects come online and RPS percentage requirements continue to increase to 50%. The costs are also adjusted for the relatively minor change associated with allowing electric cooperatives to substitute a portion of SRECs for RECs.

Power Plant Research Program

The bill has several separate effects on PPRP in DNR. First, PPRP must evaluate proposed solar electric generating facilities as part of the existing Certificate of Public Convenience and Necessity (CPCN) process. To meet the enhanced solar requirement under the bill, PPRP estimates an additional 11 (large) CPCN applications must be filed each year at an estimated cost of \$1.5 million annually. PPRP also requires three additional full-time contractual staff to handle the increased volume through fiscal 2024, in addition to a permanent half-time assistant Attorney General.

PPRP must modify an existing RPS study, at an estimated cost of \$20,000 in fiscal 2020, and must conduct a separate study on nuclear energy, at an estimated cost of up to \$150,000, also in fiscal 2020. Subsequently, PPRP must conduct a supplemental study related to a 100% RPS by January 1, 2024, at an estimated total cost of \$1.8 million. DLS cannot independently verify this amount. For purposes of this estimate, the estimated cost of the supplemental RPS study has been evenly apportioned over four fiscal years.

Absent sufficient general funds to conduct additional CPCN analyses, hire staff, and conduct the additional studies, either funds in ETF are redirected from existing projects or PPRP is unable to meet some of the bill's requirements. Therefore, general fund expenditures for DNR (PPRP) increase by \$2,434,313 in fiscal 2020. This estimate reflects the cost of hiring three contractual and one half-time permanent staff, effective October 1, 2019, to handle the additional volume of solar CPCNs. It includes salaries, fringe benefits, one-time start-up costs, ongoing operating expenses, and costs associated with additional CPCN evaluations and studies.

Permanent Position	0.5
Contractual Positions	3
Salaries and Fringe Benefits	\$253,112
CPCN Evaluation Costs	1,540,000
Study Costs	620,000
Other Operating Expenses	<u>21,201</u>
Total FY 2020 DNR Expenditures	\$2,434,313

Future year expenditures of \$2.3 million annually from fiscal 2021 through 2023 and \$1.9 million in fiscal 2024 reflect full salaries with annual increases and employee turnover, ongoing operating expenses, the costs of the supplemental study through fiscal 2023, and continued CPCN evaluation costs.

This estimate does not include any health insurance costs that could be incurred for specified contractual employees under the State’s implementation of the federal Patient Protection and Affordable Care Act.

PSC Costs

The bill’s offshore wind provisions have several separate effects on PSC, which will each require assistance from consultants. PSC’s estimates of the costs for each service, which are based in part on the known costs associated with the Maryland Offshore Wind Energy Act of 2013, total \$3.8 million in fiscal 2020, for services rendered over the next several fiscal years. Consultant costs are as follows:

- *\$2.7 million:* Offshore wind project evaluation and comparison of an estimated 15 projects over three years for potential sites off the coasts of Maryland, Delaware, New Jersey, and Virginia.
- *\$300,000:* Estimation of need for transmission upgrades and associated costs.
- *\$600,000:* Annual review of community benefit agreements, which PSC has no experience with, of approved projects and preparation of an annual report (costs cover five fiscal years).
- *\$200,000:* Outside counsel assistance in modifying existing offshore wind regulations.

PSC notes that one-year costs of this magnitude make it likely that it will hit its statutory assessment cap, which may complicate initial implementation.

DLS concurs with these estimates, and also notes that special fund revenues and expenditures may further increase to the extent that PSC requires any staff or information technology upgrades to implement the bill. Therefore, special fund expenditures for PSC

increase by *at least* \$3.8 million in fiscal 2020, and may increase in future years. Special fund revenues increase correspondingly from assessments imposed on public service companies.

SEIF Transfers

Transferring funds from SEIF for other purposes does not affect overall SEIF revenues or expenditures. However, individual programs currently funded by SEIF may receive less revenue. MEA advises that existing pressures on RGGI-backed SEIF funding for renewable/clean energy and energy efficiency programs are exacerbated by the required transfers.

The bill specifies that \$15.0 million in total must be transferred from SEIF beginning in fiscal 2021: \$7.0 million to SMWOBA in Commerce and \$8.0 million to the EARN program in the Department of Labor, Licensing, and Regulation (DLLR). For the EARN transfers, the bill specifies that money must come from the Renewable Energy, Climate Change Account in SEIF.

Annual amounts are specified for the SMWOBA transfers from fiscal 2021 through 2028, but the bill does not specify annual amounts for the EARN transfers – only that they begin in fiscal 2021. This estimate assumes that transfers are made in the same proportion as those for SMWOBA, as shown in **Exhibit 3**; the actual timing of EARN transfers may vary significantly. Special fund revenues and expenditures for Commerce and DLLR increase correspondingly to reflect the transfers, although the timing of the expenditures may vary, depending on program implementation.

Both Commerce and DLLR advise that the limitations placed on the transferred funds make implementation difficult.

Exhibit 3
Strategic Energy Investment Fund Transfers
Fiscal 2021-2028
(\$ in Millions)

	<u>FY</u> <u>2021</u>	<u>FY</u> <u>2022</u>	<u>FY</u> <u>2023</u>	<u>FY</u> <u>2024</u>	<u>FY</u> <u>2025-28</u>	<u>Total</u>
SMWOBA	\$0.2	\$0.5	\$0.5	\$1.0	\$4.8	\$7.0
EARN	0.2	0.6	0.6	1.1	5.5	8.0
Total	\$0.4	\$1.1	\$1.1	\$2.1	\$10.3	\$15.0

Note: Numbers may not sum to total due to rounding.

SMWOBA: Small, Minority, and Women-Owned Businesses Account
EARN: Maryland Employment Advancement Right Now

Source: Department of Legislative Services

Offshore Wind Approvals

Part of the application process for new offshore wind projects requires applicants to deposit a minimum of \$6.0 million in the Maryland Offshore Wind Business Development Fund (MOWBDF). Therefore, special fund revenues and corresponding expenditures for MOWBDF increase by at least \$6.0 million for each offshore wind project approved by PSC. The exact amount and potential timing of such revenues is unknown, but likely occur from fiscal 2021 through 2025, based on the bill’s application timelines.

Local Fiscal Effect: Local expenditures increase beginning in fiscal 2020 due to higher electricity prices. Local revenues increase beginning in fiscal 2020 from taxes and fees associated with additional solar installations.

Small Business Effect: The bill’s wide-ranging effects have meaningful positive and negative impacts on various small businesses, discussed separately below.

Specific to the RPS increases, all small businesses incur higher electricity prices beginning as early as fiscal 2020. However, the bill also creates demand for solar and other renewable energy technology installations. Small businesses in those industries benefit from increased demand to design, build, install, and maintain renewable energy systems.

Specific to the SEIF transfers, small businesses, to the extent that they qualify under the bill's requirements, benefit from additional funding made available to SMWOBA and EARN, while other small businesses may benefit from additional qualified employees.

Finally, the bill's annual MBE-related reporting requirement for all electricity suppliers is likely difficult to comply with, and, depending on how the provision is implemented, affects a large number of small electricity suppliers and other businesses in related industries. PSC advises that it is not aware of any entity that tracks MBE and minority participation in the activities that support the creation of RECs. Generally, electricity suppliers purchase RECs from brokers, and as such may not know which facility created a particular REC and the level of MBE and minority participation in the activities that supported the REC generation.

Additional Information

Prior Introductions: SB 732 of 2018, a similar bill, received a hearing from the Senate Finance Committee; however, no further action was taken. Its cross file, HB 1453, received a hearing from the House Economic Matters Committee, but was withdrawn.

Cross File: HB 1158 (Delegate Lisanti, *et al.*) - Economic Matters.

Information Source(s): Department of Commerce; Department of Labor, Licensing, and Regulation; Department of Natural Resources; Maryland Energy Administration; Office of People's Counsel; Public Service Commission; Comptroller's Office; Maryland Department of the Environment; Baltimore City; Montgomery and Worcester counties; Maryland Association of Counties; City of Westminster; Town of Leonardtown; Department of Legislative Services

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Appendix – Maryland’s Renewable Energy Portfolio Standard

Maryland’s Renewable Energy Portfolio Standard (RPS) was enacted in 2004 to facilitate a gradual transition to renewable sources of energy. There are specified eligible (“Tier 1”) sources as well as carve-outs for solar and offshore wind. Electric companies (utilities) and other electricity suppliers must submit renewable energy credits (RECs) equal to a percentage specified in statute each year or else pay an alternative compliance payment (ACP) equivalent to their shortfall. Historically, the requirements have been met almost entirely through RECs, with negligible reliance on ACPs. The Maryland Energy Administration must use ACPs to support new renewable energy sources.

The percentage requirements gradually increase to a minimum of 25%, including 2.5% from solar sources, by 2020. In 2019, the requirements are 20.4%, including at least 1.95% from solar energy.

Generally, a REC is a tradable commodity equal to one megawatt-hour of electricity generated or obtained from a renewable energy generation resource. In other words, a REC represents the “generation attributes” of renewable energy – the lack of carbon emissions, its renewable nature, etc. A REC has a three-year life during which it may be transferred, sold, or redeemed. REC generators and electricity suppliers are allowed to trade RECs using a Public Service Commission-approved system known as the Generation Attributes Tracking System, a trading platform designed and operated by PJM Environmental Information Services, Inc. that tracks the ownership and trading of RECs.

Tier 1 sources include wind (onshore and offshore); qualifying biomass; methane from anaerobic decomposition of organic materials in a landfill or wastewater treatment plant; geothermal; ocean, including energy from waves, tides, currents, and thermal differences; a fuel cell that produces electricity from specified sources; a small hydroelectric plant of less than 30 megawatts; poultry litter-to-energy; waste-to-energy; refuse-derived fuel; and thermal energy from a thermal biomass system. Eligible solar sources include photovoltaic cells and residential solar water-heating systems commissioned in fiscal 2012 or later.

Prior to 2019, there was also a Tier 2 in RPS, with separate percentage requirements (2.5% annually). Tier 2, which eventually included only large hydroelectric power plants, provided a smaller monetary incentive than Tier 1 and terminated at the end of 2018.

RPS Compliance

According to the most recent RPS compliance [report](#) on PSC’s website, electricity suppliers retired approximately 9.0 million RECs at a cost of \$72.0 million in 2017. This is a significant decrease in costs and a deviation from the previous trend, as shown in **Exhibit 1**. Costs in 2016 and 2017 were based on a comparable total number of RECs; the decrease in compliance cost was due to REC prices. The price of nonsolar RECs used for compliance decreased from \$12.22 to \$7.14 during those years. Solar RECs prices decreased even more substantially, from \$110.63 to \$38.18.

In 2017, wind (43%), black liquor (24%), small hydroelectric (13%), municipal solid waste (10%), and wood and waste solids (7%) were the primary energy sources used for RPS compliance. Maryland facilities generated about 4.3 million RECs in 2017, which were used for compliance in Maryland and also in several other states; likewise, Maryland electricity suppliers used RECs from other states for compliance with Maryland’s RPS.

Exhibit 1 Cost of RECs for RPS Compliance (\$ in Millions)

	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>
Tier 1 Nonsolar	\$12.5	\$32.7	\$70.6	\$85.1	\$88.2	\$50.0
Tier 1 Solar	11.3	21.4	29.4	39.1	45.6	21.3
Tier 2	<u>0.7</u>	<u>2.8</u>	<u>4.0</u>	<u>2.6</u>	<u>1.4</u>	<u>0.7</u>
Total	\$24.5	\$56.8	\$104.0	\$126.7	\$135.2	\$72.0

Note: Numbers may not sum to total due to rounding. Tier 2 terminated at the end of 2018.

REC: renewable energy credits

RPS: Renewable Energy Portfolio Standard

Source: Public Service Commission

Pursuant to Chapter 393 of 2017, the Power Plant Research Program in the Department of Natural Resources has released its December 2018 interim report on a comprehensive study of RPS. The report contains historical data but also looks at future scenarios. The report can be found [here](#) or on the department’s website.