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STATE GOVERNMENT ENERGY COMMITTEE

Renewable Energy and Meeting New Hampshire's State Operations Energy Goals

Appendix I: Renewable Energy Certificates Options and Impacts

In Response to Executive Order 2016-3 (Supersedes 2011-1)

EXECUTIVE SUMMARY

Since renewable energy options are an important and increasing part of meeting the state's energy management goals, and because aspects of New Hampshire law and State of New Hampshire fossil fuel energy accounting practices may currently conflict, it is appropriate that the State Government Energy Committee consider the issue of how the State handles the renewable energy credits (REC)[1] that may be available from various state renewable energy systems such as solar photovoltaic electric and thermal heating systems and to develop policies for claiming and use of RECs. This document provides an introduction to current and potential treatment of the State's REC-eligible energy systems to enable the SGEC to define how these systems should be treated going forward.

In order to evaluate how RECs generated by state-owned energy facilities should be treated, three high-level objectives were drawn from the language of *Executive Order 2016-03*.

Objective 1: Reduce Impacts - Reduce negative environmental and public health impacts by reducing fossil-fuel energy use in state buildings, operations and fleets.[2]

Objective 2: Reduce Expenditures - Reduce energy expenditures in buildings and fleets.

Objective 3: Lead By Example - Lead by example in energy efficiency, conservation and renewable energy.

The objectives were used to compare seven potential pathways that the State could follow to manage RECs. Following the preliminary evaluation and consultation with the State Government Energy Committee (SGEC), it was determined that the first three did not merit further consideration due to negative impact to the State's energy goals or impact on funding for future energy projects.

The seven pathways are briefly described below and in more detail in the following section.

Not Recommended for Further Action

1) **No Action (BAU Case):** Make no changes to the present treatment of REC-eligible systems and leave in place current tracking and reporting practices for energy consumption (including calculations of fossil-fuel reduction) and cost.

2) **Update Energy Accounting:** Take no action towards certifying and claiming RECs, but correctly show the electricity production from the uncertified net-metered energy systems as energy obtained from the ISO-NE grid.

3) **Sell:** Certify eligible renewable-energy systems and sell RECs and allow revenues to flow into General Fund.

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[1] RECs are tradable commodities that prove 1 megawatt-hour of electricity was generated from a renewable energy source. A megawatt-hour equals 1,000 kilowatt-hours, and the average residential customer consumes about 800 kilowatt-hours a month. http://www.ctcleanenergy.com/BasicsofCleanEnergy/RenewableEnergyCertificates/tabid/74/Default.aspx

[2] Environmental impacts may include: ground-level ozone; acid deposition; water pollution; small particle pollution; regional haze; mercury contamination; and climate change. These impacts in turn can lead to public health impacts.

Under Further Consideration

4) **Retire:** Certify eligible renewable-energy systems and retire the RECs.

5) **Swap (REC Arbitrage):** Sell the more valuable compliance RECs, and purchase lower cost RECs from the voluntary REC market to claim the renewable energy use. Put remaining revenue toward energy efficiency or renewable energy projects.

6) **Reinvest:** Certify eligible renewable-energy systems, sell the RECs with revenue going the State Energy Fund, and reinvest the proceeds in future energy projects.

7) **Tiered Strategy:** Sell RECs associated with a project specifically to reduce payback period. Cannot claim fossil fuel reduction during this period. Once system is paid off, begin retiring RECs and counting the generation toward fossil fuel reduction goals.

Table 1 below provides a summary of each of the six potential pathways by showing either a positive (+, green), negative (-, red), or neutral (blank, grey) outcome relative to each of the three objectives above. A three-phased process has been recommended to further explore options four through seven ("Recommendations" document).

TABLE 1. REC MANGEMENT PATHWAYS

Comparison Chart	**Objective 1**	**Objective 2**	**Objective 3**
	Reduce Public Health & Environmental Impacts	*Reduce Energy Expenditures*	*Lead By Example*
1. No Action (BAU)			-
2. Update Energy Accounting			--
3. Sell	-	+	-
4. Retire	++		+
5. Swap (REC Arbitrage)		+	+
6. Reinvest	++	+	+
7. Tiered Strategy	++	+	+

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STATE GOVERNMENT ENERGY COMMITTEE

Renewable Energy and Meeting New Hampshire's State Operations Energy Goals
Renewable Energy Credits: Options and Impacts
In Response to Executive Order 2016-3 (Supersedes 2011-1)

Introduction

Since 2004, three governors have issued four Executive Orders[3] aimed at tracking and reducing fossil-fuel energy use in state government buildings and fleets in order to reduce costs and harmful air pollution emissions. Between FY2005 and FY2016, the State has made significant progress in managing its energy consumption resulting in over $10 million in avoided energy costs to date. Funding for these cost-effective[4] projects has come from the State's capital budget, payments for the State's participation in electric-utility demand-response programs, and through energy-savings performance contracts. As the State's energy management efforts have expanded in scale so too has the range of technologies and project types considered for achieving the State's energy-management goals that, in turn, have increased the complexity of issues related to tracking, management and accounting. This paper considers the potential treatment of the renewable energy attributes of state-owned electric and thermal renewable energy projects.

The issue at hand is whether the State should ever sell Renewable Energy Certificates (RECs). One REC represents one megawatt-hour (MWh) generated by an eligible renewable-energy generating source. RECS have a market value to regulated energy suppliers in the state as they must obtain and "retire"[5] RECs sufficient to demonstrate they have met the required percentage of renewable electricity in the energy supplied by the provider to its end-use customers.[6] Figure 1 below depicts the flow of the REC market under the State's Renewable Portfolio Standard (RPS).[7]

The State has a number of REC-eligible renewable-energy projects at state facilities, but has not certified, retired or sold RECs to date. Below we investigate the relationship between the State's goals and RECs, presenting a set of potential pathways and their implications for the State Government Energy Committee to consider in deciding how to manage RECs going forward.

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[3] EO 2004-7, http://sos.nh.gov/WorkArea/DownloadAsset.aspx?id=24456; EO 2005-4, http://sos.nh.gov/WorkArea/DownloadAsset.aspx?id=24529; EO 2011-1, http://sos.nh.gov/WorkArea/DownloadAsset.aspx?id=24566; and EO 2016-03, http://sos.nh.gov/WorkArea/DownloadAsset.aspx?id=8589958179.

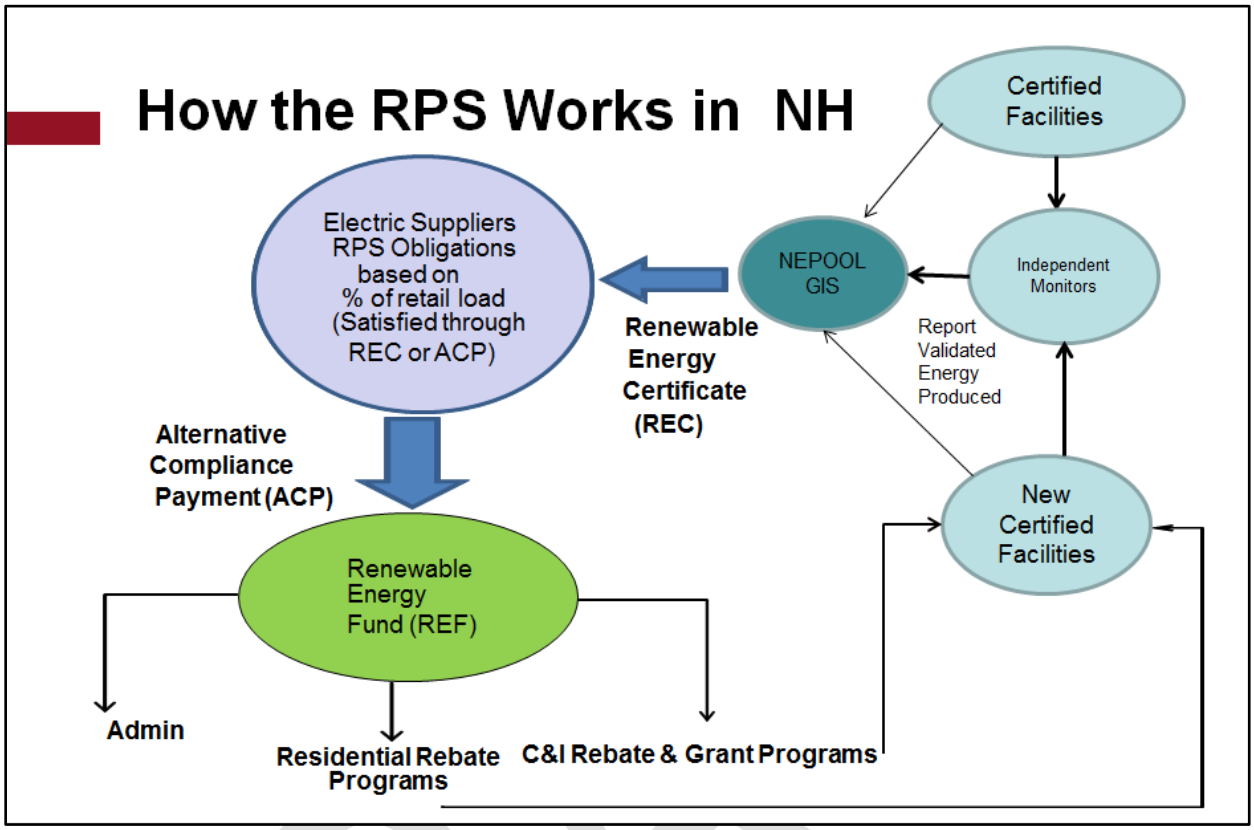
[4] Cost effective is defined as a cost savings that exceeds the project cost over a 10 to 20 year horizon (horizon was changed statutorily to 20 years in 2012).

[5] PUC 2502.33 "Retire" means to make no further use of a certificate for purposes of trading in the generation attributes associated with the certificate. http://www.PUC.state.nh.us/Regulatory/Rules/Puc2500.pdf.

[6] NH RSA Chapter 362-F, *Electric Renewable Portfolio Standard*, Section 362-F:6, *Renewable Energy Certificates*, http://www.gencourt.state.nh.us/rsa/html/xxxiv/362-F/362-F-6.htm. (Accessed June 29, 2017)

[7] A renewable portfolio standard (RPS) is a regulatory mandate to increase production of energy from renewable sources such as wind, solar, biomass and other alternatives to fossil fuel energy. https://www.nrel.gov/tech_deployment/state_local_governments/basics_portfolio_standards.html

FIGURE 1. NEW HAMPSHIRE RPS FLOWCHART



Background

Executive Order 2016-03[8] calls for a reduction in aggregate fossil-fuel energy use[9] across all state-owned facilities on a square foot basis, as compared to a 2005 baseline, by:

- 30 percent by 2020; and
- 40 percent by 2025; and
- 50 percent by 2030.

In order to achieve these goals, the SGEC adopted a work plan in January 2017 that called for the development of guidance regarding RECs generated by state-owned renewable-energy facilities. One REC represents one megawatt-hour (MWh) generated by an eligible renewable-energy generating source as defined under *RSA 362-F:6*.[10] Under New Hampshire law, REC eligible energy sources include: wind; solar; small hydro; biomass; methane gas; and renewable thermal.[11] Eligible generators must

[8] EO 2016-03, "*An order for state government to continue to lead-by-example in energy efficiency, conservation, and renewable energy*," http://sos.nh.gov/WorkArea/DownloadAsset.aspx?id=8589958179.

[9] The use of the terminology "fossil-fuel energy use" is in keeping with the goals established by SB73 (2010 Session) that are in RSA 21-I:14-c, http://www.gencourt.state.nh.us/rsa/html/i/21-I/21-I-14-c.htm. (Accessed June 29, 2017)

[10] NH RSA Chapter 362-F, *Electric Renewable Portfolio Standard*, Section 362-F:6, *Renewable Energy Certificates*, http://www.gencourt.state.nh.us/rsa/html/xxxiv/362-F/362-F-6.htm. (Accessed June 29, 2017)

[11] CHAPTER PUC 2500 ELECTRIC RENEWABLE PORTFOLIO STANDARD, Sections 2502.06-2502.10, http://www.PUC.state.nh.us/Regulatory/Rules/Puc2500.pdf.

certify their production to be granted RECs. These RECs can then be sold by generators to energy suppliers in New Hampshire and New England to be used to comply with State Renewable Portfolio Standards. As such, RECs represent a potential income stream for the State.

However, when a REC is sold, so too are the environmental attributes associated with that generated energy because the energy supplier purchasing the REC is able to claim the renewable attribute from that source (*e.g.*, a state-owned solar facility). As noted in the NH PUC rules, *PUC 2504.02 Transferability of Certificates*, each REC shall be used only once. If it is claimed by an entity for compliance purposes, it cannot be sold, retired, claimed or represented by other entities or purposes. [12] Thus, if the State chooses to sell RECs that State facilities generate, the State should no longer claim to be using that renewable energy.

Under New Hampshire law, energy suppliers are also allowed to calculate unclaimed RECs from net-metered renewable electric energy systems (*e.g.*, solar) that have not certified their systems, and can count those unclaimed RECs toward their compliance requirements for renewable generation under the State's RPS.[13] Any production from state-owned renewable-energy generation systems that the State does not certify and claim for itself can be claimed by energy suppliers and, per *PUC 2504.02,* the "environmental attributes" of that production then belong to the energy supplier. Department of Administrative Services currently estimates the capacity of such state-owned systems at about 150kW, but expects to see an increase as renewable systems become a more common element of State building projects.

Renewable Energy Certificate Evaluation

State Energy Management Objectives

In order to evaluate how RECs generated by state-owned energy facilities should be treated, three high-level objectives were drawn from the language of *Executive Order 2016-03*. The objectives were used to compare seven potential pathways that the State could follow to manage RECs.

Objective 1: Reduce Impacts - Reduce negative environmental and public health impacts by reducing fossil-fuel energy use in state buildings, operations and fleets.[14]

Objective 2: Reduce Expenditures - Reduce energy expenditures in buildings and fleets.

Objective 3: Lead By Example - Lead by example in energy efficiency, conservation and renewable energy.

[12] PUC 2504.02 Transferability of Certificates, notes that: Section (b) "[a REC] certificate shall be used only once for compliance with the portfolio standards of this chapter; Section (c) "[a REC] certificate shall not be used for compliance with this chapter if it has been used for compliance with any similar requirements [or] claimed;" and Section (d) "[a REC] certificate that has been used for compliance with this chapter shall not be used for compliance with any similar requirements [or] claimed." http://www.PUC.state.nh.us/Regulatory/Rules/Puc2500.pdf

[13] NH RSA Chapter 362-F, *Electric Renewable Portfolio Standard*, Section 362-F:6, *Renewable Energy Certificates*, Part II-a, http://www.gencourt.state.nh.us/rsa/html/xxxiv/362-F/362-F-6.htm. (Accessed June 29, 2017)

[14] Environmental impacts may include: ground-level ozone; acid deposition; water pollution; small particle pollution; regional haze; mercury contamination; and climate change. These impacts in turn can lead to public health impacts such as impaired cardiovascular and respiratory function and cancer due to air and water pollution and more indirectly due to heat stress and storm damage resulting from climate change.

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The seven potential pathways that the State could pursue in handling RECs are:

1) **No Action (BAU Case):** Make no changes to the present treatment of REC-eligible systems and leave in place current tracking and reporting practices for energy consumption (including calculations of fossil-fuel reduction) and cost.

2) **Update Energy Accounting:** Take no action towards certifying and claiming RECs, but correctly show the electricity production from the uncertified net-metered energy systems as energy obtained from the ISO-NE grid.

3) **Sell:** Certify eligible renewable-energy systems and sell RECs. Allow revenues to flow into General Fund.

4) **Retire:** Certify eligible renewable-energy systems and retire the RECs.

5) **Swap (REC Arbitrage):** Certify eligible renewable-energy systems. Modify state statute to allow the revenue from the sale more valuable compliance RECs to purchase lower-cost RECs from the voluntary REC market. Put remaining revenue toward energy efficiency or renewable energy projects.

6) **Reinvest:** Certify eligible renewable-energy systems and modify state statute to allow the revenue from the sale RECs to go into the State's *Energy Fund*. Reinvest the proceeds in future energy projects.

7) **Tiered Strategy:** Sell RECs associated with a project specifically to reduce payback period. Cannot claim fossil fuel reduction during this period. Once system is paid off, retire RECs and count the generation toward fossil fuel reduction goals.

Evaluation

1) **No Action (BAU Case):** State agencies, which own and operate a REC-eligible renewable-energy system, would continue business as usual. They would not certify their system for RECs and, therefore, could not sell or retire[15] the RECs associated with their renewable-energy production.

   Action Impact on Objectives:

   Objective 1: Reduce Impacts – No positive or negative impact on public health and environmental impacts.

   Objective 2: Reduce Expenditures – No positive or negative impact on state building-energy costs.

   Objective 3: Lead By Example – Under New Hampshire law, energy suppliers are allowed to calculate unclaimed RECs from net-metered energy systems and count those unclaimed RECs toward their compliance requirements for renewable generation under the State's RPS.[16] Any production from state-owned renewable-electricity generation systems, which the State does not certify and claim, is claimed by energy suppliers. Per *PUC 2504.02,* the "environmental

[15] PUC 2502.33 "Retire" means to make no further use of a certificate for purposes of trading in the generation attributes associated with the certificate. http://www.PUC.state.nh.us/Regulatory/Rules/Puc2500.pdf.

[16] NH RSA Chapter 362-F, *Electric Renewable Portfolio Standard*, Section 362-F:6, *Renewable Energy Certificates*, Part II-a, http://www.gencourt.state.nh.us/rsa/html/xxxiv/362-F/362-F-6.htm. (Accessed June 29, 2017)

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attributes" of that production are claimed by energy suppliers. **The State's current fossil-fuel energy use accounting methodology and its annual reporting also claims those attributes and is therefore in violation of the PUC rules.**

2) **Update Energy Accounting:** Under this new accounting methodology the State would establish how much renewable-energy generation is claimed by the electric suppliers and, therefore, could not be claimed as renewable energy use by the State, and adjust reporting appropriately.

Action Impact on Objectives:

Objective 1: Reduce Impacts - No positive or negative impact on public health and environmental impacts compared to BAU.

Objective 2: Reduce Expenditures - No positive or negative impact on state building-energy costs compared to BAU.

Objective 3: Lead By Example - The State's current renewable electricity generation is currently not metered and tracked, instead appearing, as energy efficiency does, as a decrease in total energy and total fossil-fuel energy use. Metering and tracking this energy and counting it as fossil-fuel based energy would appear as both an increase in overall energy use as well as an increase in the State's fossil-fuel energy-use intensity. The net impact is that the State's energy performance is worse than previously reported, diminishing its lead by example potential.

3) **Sell:** The State could direct agencies to certify their eligible renewable-energy systems (electric and thermal) and sell the RECs generated. Alternately, the State could directly facilitate the certification of eligible state-owned renewable-energy systems and sale of RECs.

Action Impact on Objectives:

Objective 1: Reduce Impacts - Selling the State's RECs increases the supply of RECs in the market, which energy suppliers may then purchase and use for compliance purposes. Since the energy suppliers are already able to use state RECs under the BAU case, there is no impact on air pollution and overall environmental and public health as compared to BAU. Because revenue would not return to agencies or projects, selling RECs would not impact the financial viability of constructing additional state-owned renewable systems through lowered energy costs or payback periods.

Objective 2: Reduce Expenditures - Selling RECs would result in added revenue for the State minus some additional administrative costs for managing REC sales and revenues. Under current State law, the funds generated by these transactions would flow back into the general fund. This would have a flat impact on energy costs as it is not applied to agency energy costs directly or reinvested in future cost-effective energy saving projects.

Objective 3: Lead By Example - Selling RECs would prevent the State from being able to claim the "environmental attributes" of that generation. Therefore, the State could not claim fossil-fuel reduction associated with this energy production. Instead, the sale of RECs would appear as an increase in the State's fossil-fuel energy-use intensity. The State would need to pursue even greater levels of energy efficiency and conservation to achieve its targets.

4) **Retire:** The State could certify eligible renewable-energy systems and retire the RECs.

Action Impact on Objectives:

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Objective 1: Reduce Impacts - By retiring RECs, the energy suppliers will need to find new sources of RECs, potentially enticing more investment in eligible renewable generation, reducing negative environmental and public health.

Objective 2: Reduce Expenditures - There could be a cost associated with certifying systems and managing RECs.

Objective 3: Lead By Example - Retiring RECs would allow the State to claim the environmental attributes of the renewable electric generation and thermal energy and, therefore, claim the associated fossil-fuel reductions for all energy use associated with retired RECs.

5) **Swap (REC Arbitrage):** The State could certify their renewable-energy systems and sell RECs that are produced to the New Hampshire compliance market. The State could then purchase an equal number of RECs from the voluntary REC market[17] at a lower cost. There would be no change in the final fossil-fuel energy intensity for the State from an accounting standpoint. This option could require changes to state law to enable use of the funds to purchase voluntary market RECs; likely an amendment to RSA 21-I:19-f[18] to allow proceeds from the sale of RECs to be deposited into the State's *Energy Fund*.

Action Impact on Objectives:

Objective 1: Reduce Impacts - Selling the State's RECs increases the supply of RECs in the market, which energy suppliers may then purchase and use for compliance purposes. Since the energy suppliers are already able to use State RECs under the BAU case, there is no impact on air pollution and overall environmental and public health as compared to BAU. Because revenue would not return to agencies or projects, selling RECs would not impact the financial viability of constructing additional state-owned renewable systems through lowered energy costs or payback periods.

Objective 2: Reduce Expenditures - Selling RECs would result in added revenue for the State minus some additional administrative costs for managing REC sales and revenues. Under current State law, the funds generated by these transactions would flow back into the general fund. Directing the revenues towards purchasing the lower cost RECs may require changes to current state law.

Objective 3: Lead By Example – Because the State could, under this scenario, continue to claim the environmental attributes of the renewable energy generated the state would have legal standing to claim renewable energy attributes by purchasing low cost RECs from the voluntary market. While this is not a change from BAU, current practices are not in compliance with state rules, thus this is ranked as a positive change compared to BAU.

6) **Reinvest:** The State could certify and sell the RECs and use the funds generated invest in the development of additional renewable energy or energy efficiency projects. This could reduce the payback time for onsite renewable-energy or efficiency projects and make these projects more attractive to state agencies. This would require an amendment to RSA 21-I:19-f[19] to allow proceeds from the sale of RECs to be deposited into the State's *Energy Fund*.

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[17] https://www.epa.gov/greenpower/us-renewable-electricity-market
[18] NH RSA Chapter 21-I, *Department of Administrative Services*, Section 21-I:19-f, *State Facility Energy Cost Reduction*, http://www.gencourt.state.nh.us/rsa/html/i/21-I/21-I-19-f.htm. (Accessed on July 3, 2017)
[19] NH RSA Chapter 21-I, *Department of Administrative Services*, Section 21-I:19-f, *State Facility Energy Cost Reduction*, http://www.gencourt.state.nh.us/rsa/html/i/21-I/21-I-19-f.htm. (Accessed on July 3, 2017)

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Objective 1: Reduce Impacts - The revenue generated by the REC sales could be used to finance additional projects that would not otherwise have been pursued with existing capital resources and finance mechanisms. If additional projects are enabled, this could have a beneficial impact on environmental and public health.

Objective 2: Reduce Expenditures - Selling RECs would result in added revenue for the State minus some additional administrative costs for managing REC sales and revenues. Allowing REC revenue to be invested in additional cost-effective energy-management projects would have a beneficial impact on energy costs.

Objective 3: Lead By Example - Selling RECs would prevent the State from being able to claim the "environmental attributes" of that generation. Therefore, the State could not claim fossil-fuel energy-use reduction associated with this energy production. Instead, the sale of RECs would appear as an increase in the State's fossil-fuel energy-use intensity. However, additional energy projects could offset some of these "losses" and the State could highlight the cost-effectiveness of the projects through outreach and education, perhaps encouraging similar investment by the private sector. Therefore, this option provides a positive change in the State's ability to lead by example.

7) **Tiered Strategy:** Sell RECs associated with a project specifically to reduce payback period by building in revenue from the projects RECs into the financing mechanism. Cannot claim fossil fuel reduction during this period. Once system is paid off, retire RECs and count the generation toward fossil fuel reduction goals.

Objective 1: Reduce Impacts - The revenue generated by the REC sales could be used to reduce project payback periods for projects that would not otherwise have been pursued with existing capital resources and finance mechanisms. If additional projects are enabled, this could have a beneficial impact on environmental and public health.

Objective 2: Reduce Expenditures - Selling RECs would result in added revenue for the State minus some additional administrative costs for managing REC sales and revenues. This may partly be covered by project financing package agreed to with developers. Allowing REC revenue to be invested in additional cost-effective energy-management projects would have a beneficial impact on energy costs.

Objective 3: Lead By Example – Temporarily selling RECs would prevent the State from being able to claim the "environmental attributes" of that generation. Therefore, the State could not claim fossil-fuel energy-use reduction associated with this energy production. Instead, the sale of RECs would appear as an increase in the State's fossil-fuel energy-use intensity. However, additional energy projects could offset some of these "losses" and the State could highlight the cost-effectiveness of the projects through outreach and education, perhaps encouraging similar investment by the private sector. Therefore, this option provides a positive change in the State's ability to lead by example.

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